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(54) ANTI-SEMAPHORIN 3A ANTIBODIES

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A61K 39/395	(2006.01)
A61P 9/10	(2006.01)
A61P 13/12	(2006.01)
C07K 16/18	(2006.01)
A61K 39/00	(2006.01)

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CPC	C07K 16/2803 (2013.01); A61K 39/3955 (2013.01); A61P 9/10 (2018.01); A61P 13/12 (2018.01); C07K 16/18 (2013.01); A61K 2039/505 (2013.01); C07K 2317/33 (2013.01); C07K 2317/565 (2013.01); C07K 2317/76 (2013.01); C07K 2317/92 (2013.01)
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(58) Field of Classification Search

None

See application file for complete search history.

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(57) ABSTRACT

The present disclosure relates to an isolated antibody or antigen-binding fragment thereof that binds to human Semaphorin 3A (Sema3A). An antibody conjugate and a pharmaceutical composition each comprising the isolated antibody or antigen-binding fragment thereof that binds to human Sema3A are also provided.

11 Claims, 15 Drawing Sheets

Specification includes a Sequence Listing.

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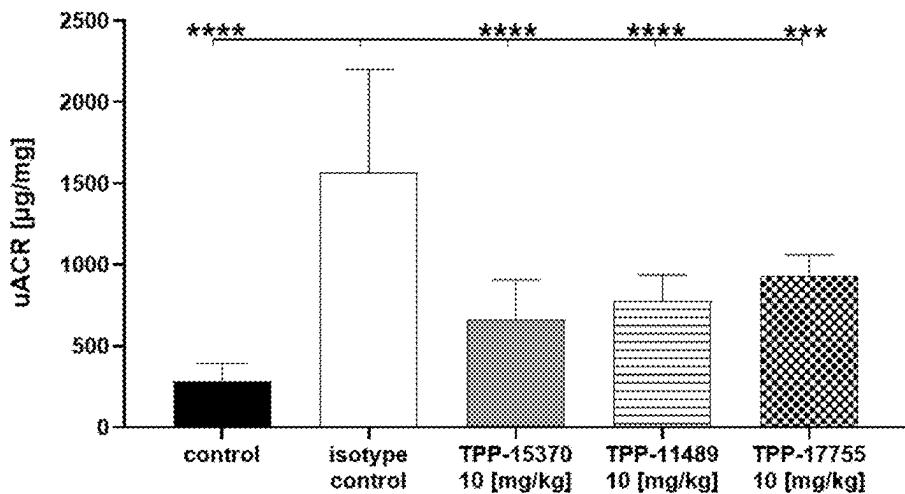
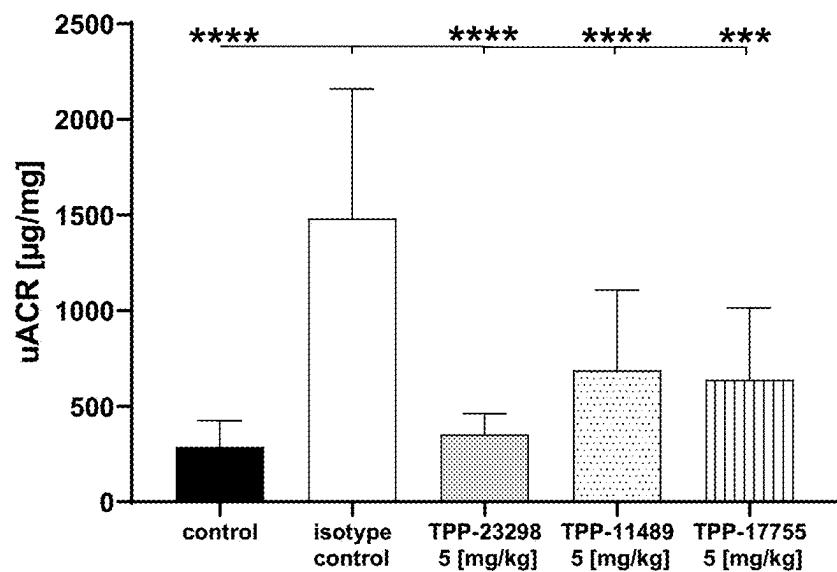
Fig. 1A**Fig. 1B**

Fig. 2A

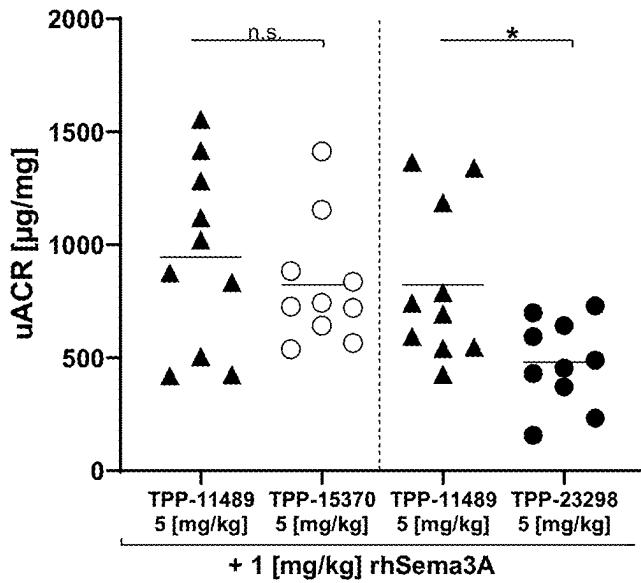


Fig. 2B

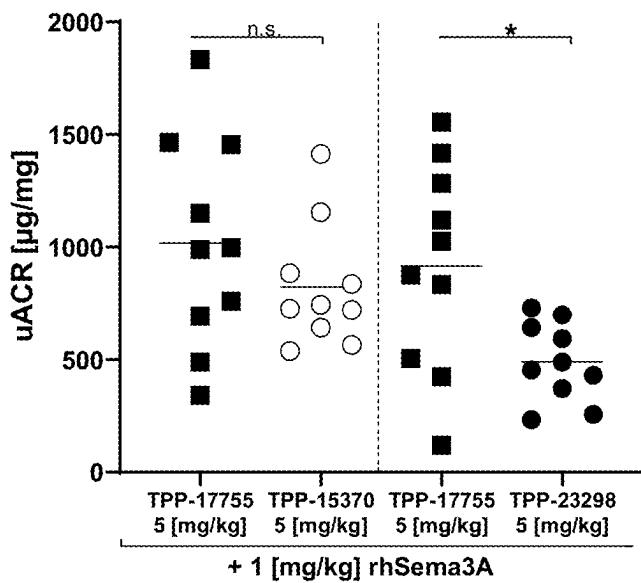


Fig. 2C

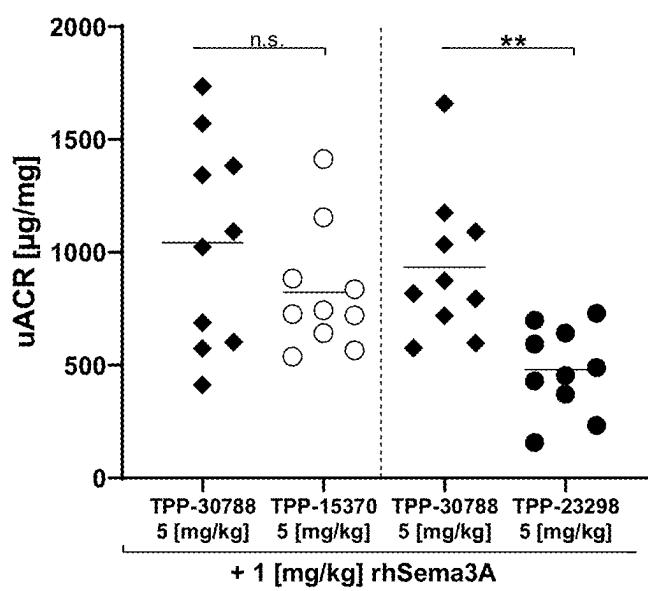


Fig. 3A

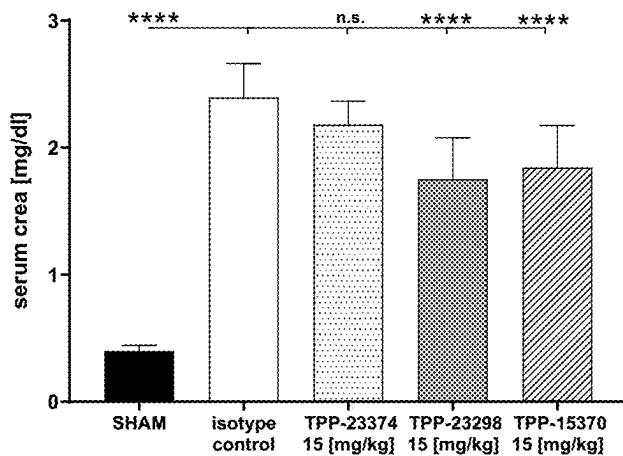


Fig. 3B

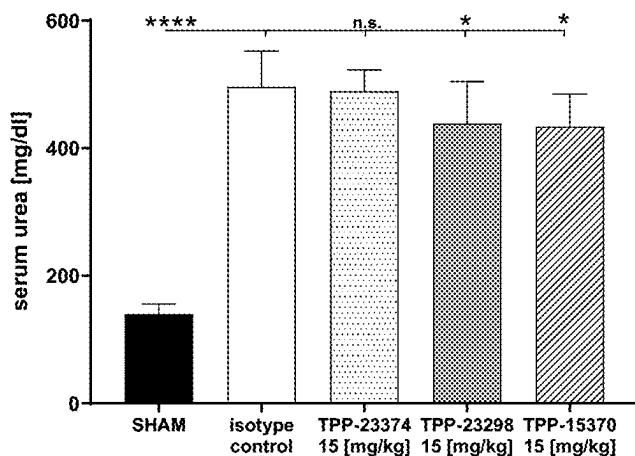


Fig. 3C

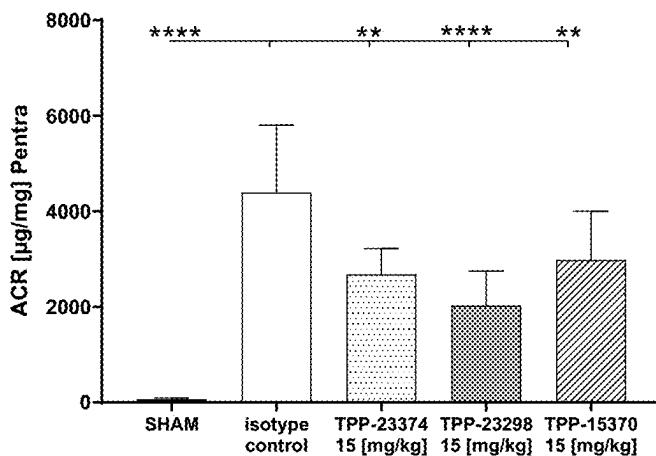


Fig. 4A

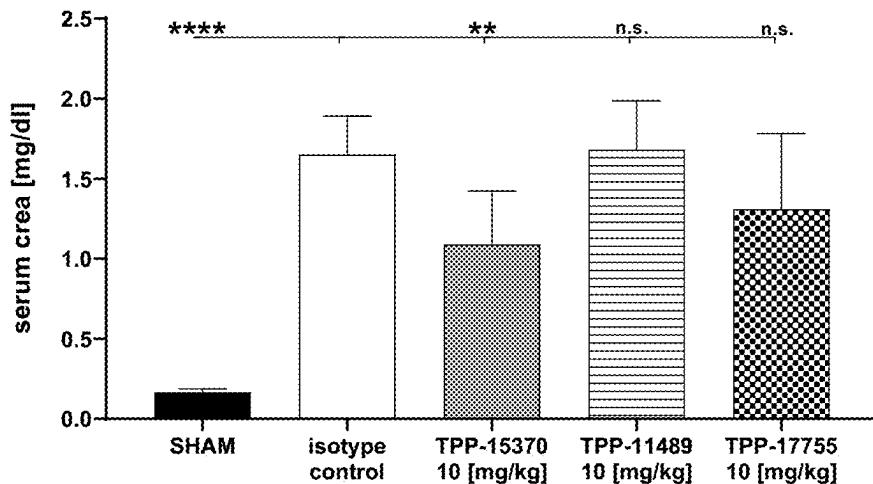


Fig. 4B

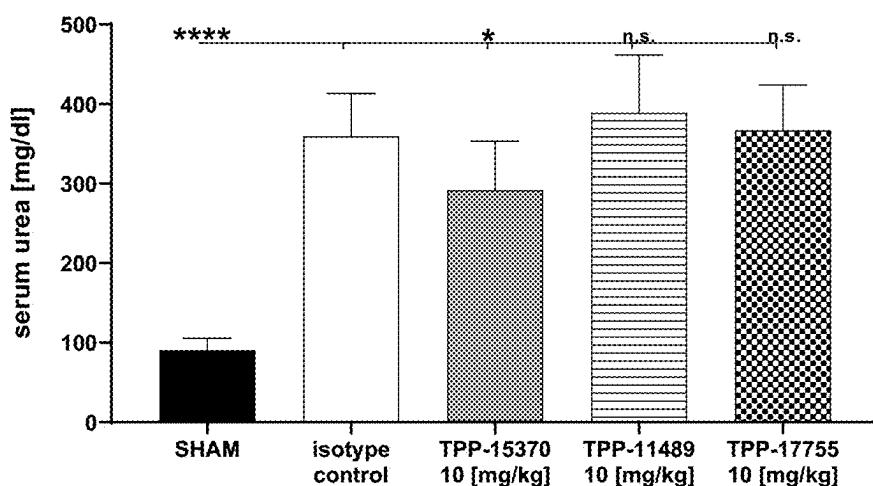


Fig. 4C

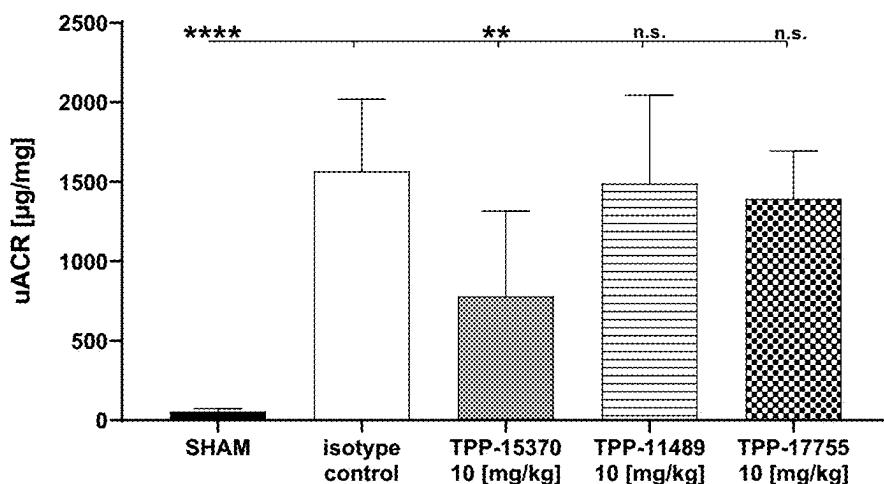


Fig. 5A

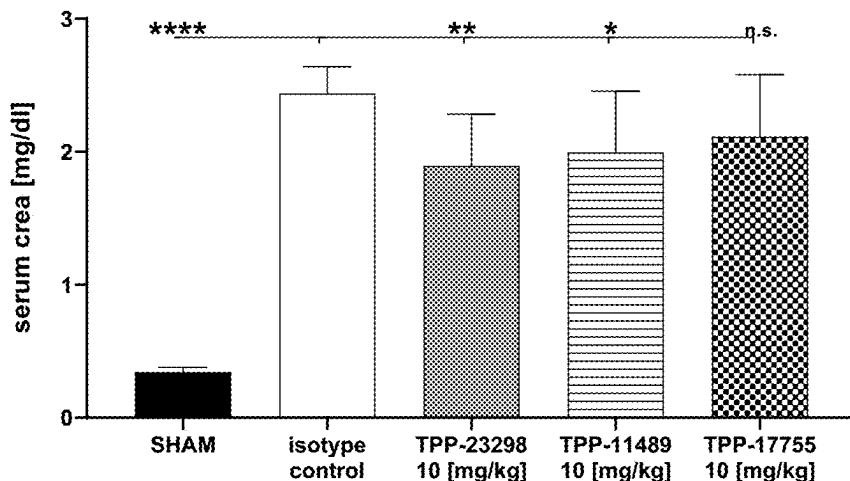


Fig. 5B

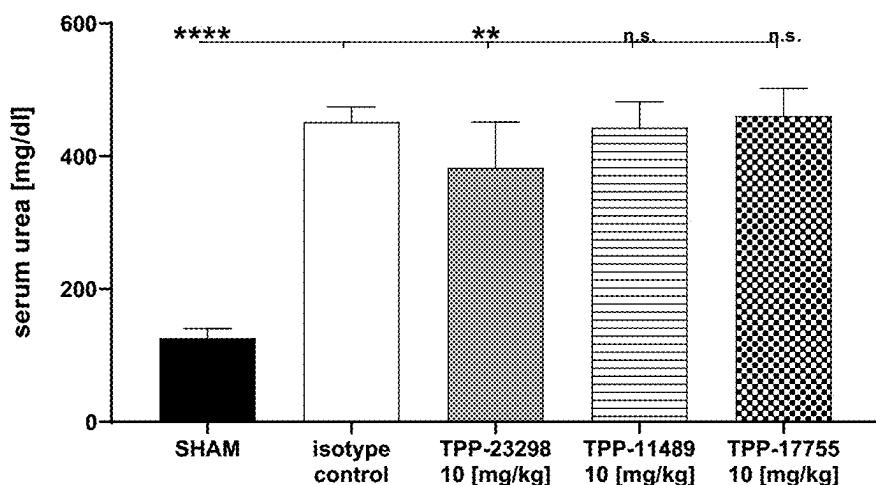


Fig. 5C

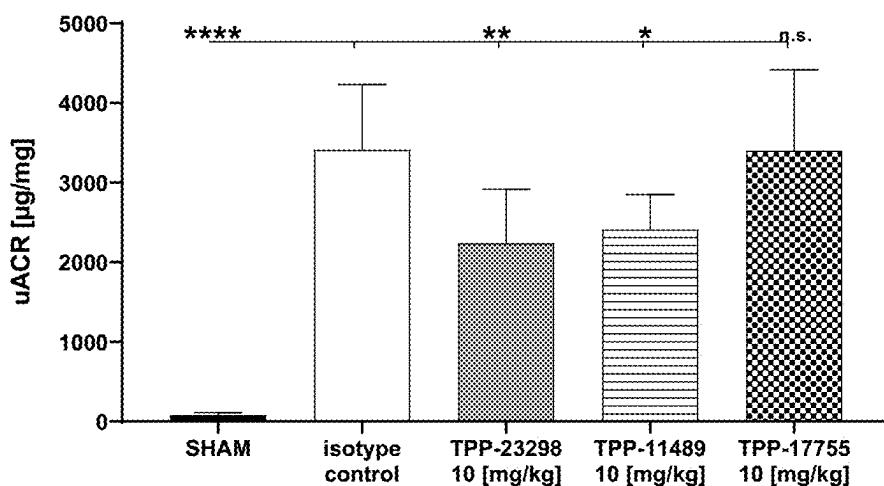


Fig. 6A

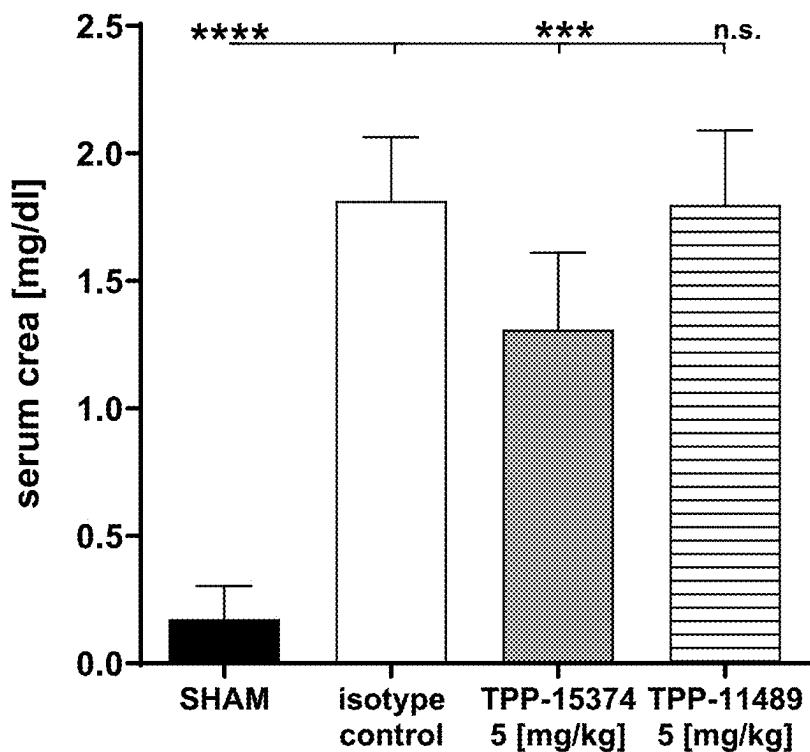


Fig. 6B

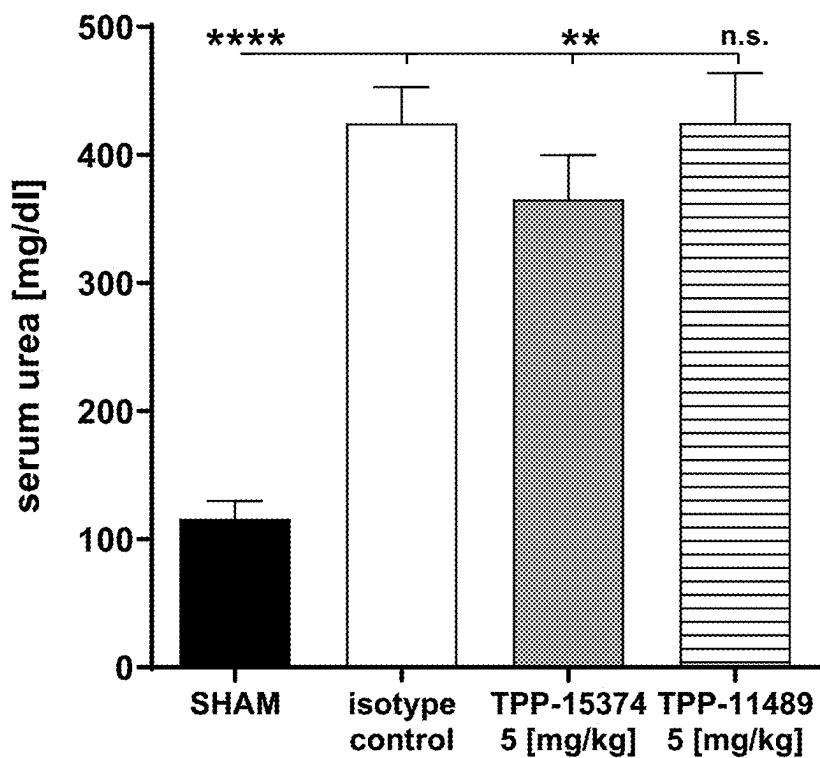


Fig. 6C

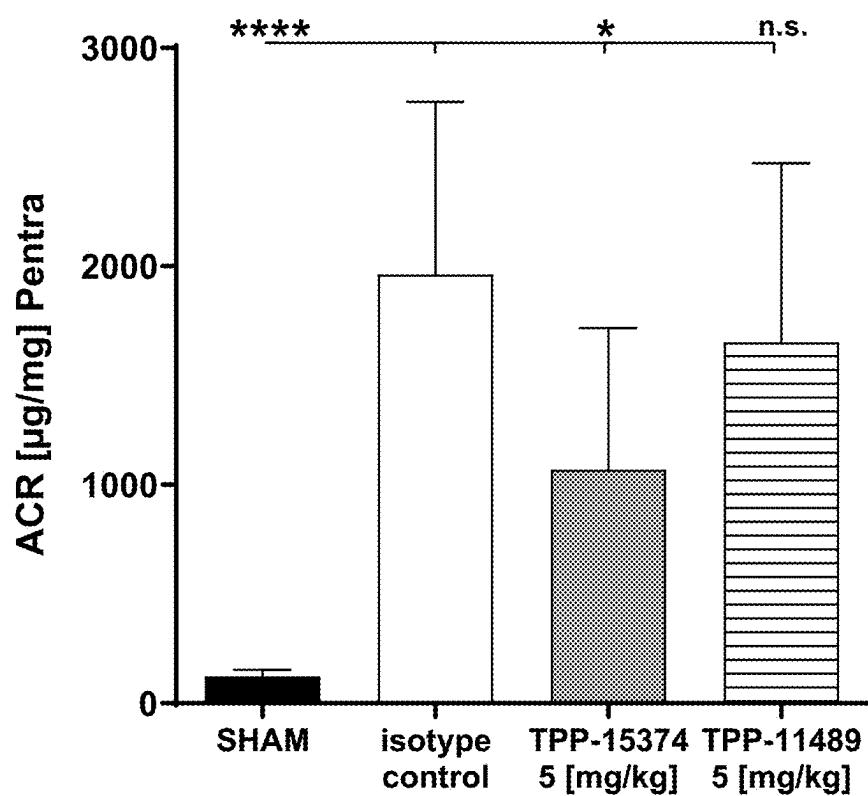


Fig. 7

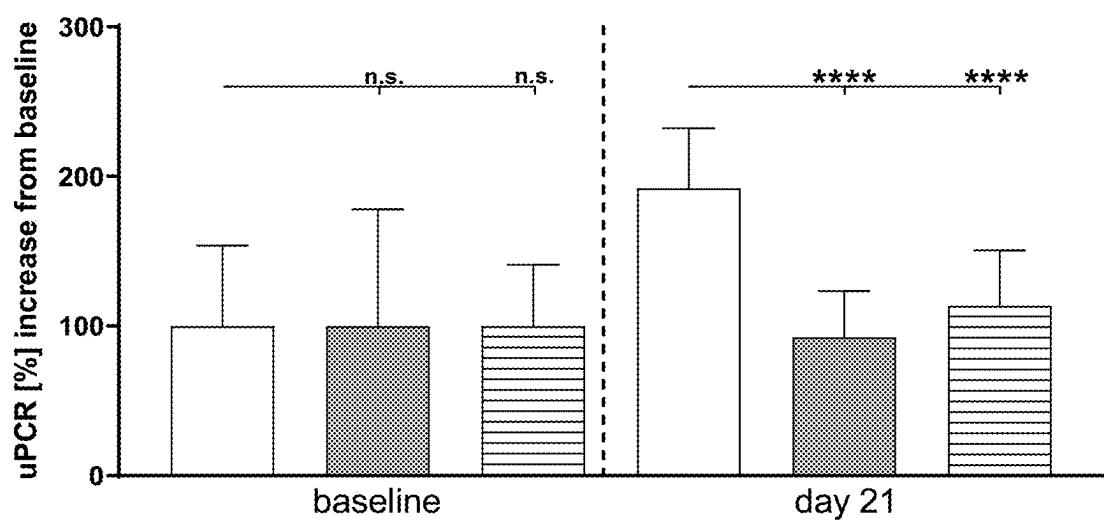


Fig. 8A

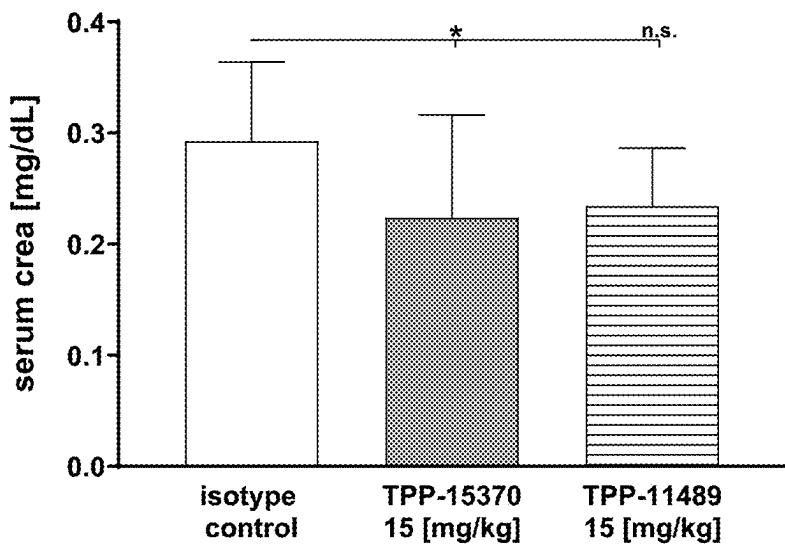


Fig. 8B

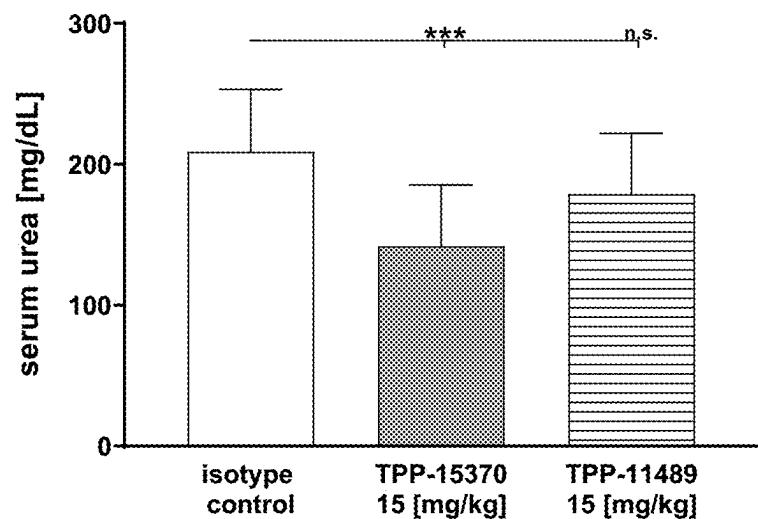


Fig. 8C

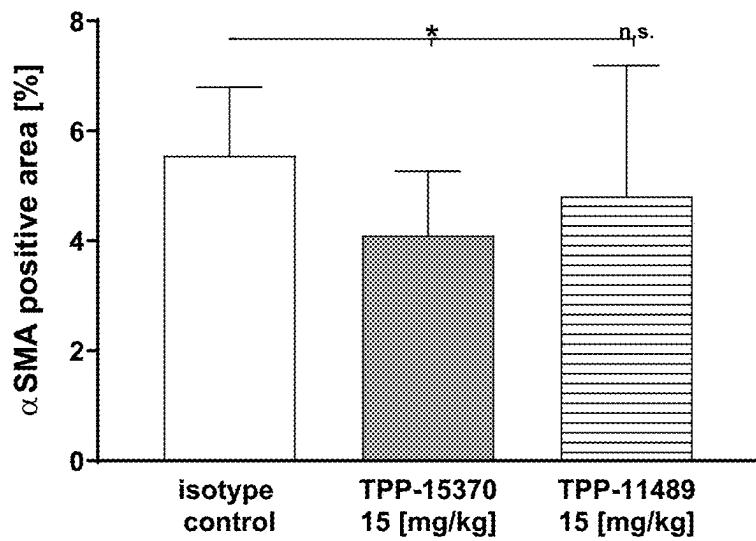


Fig. 8D

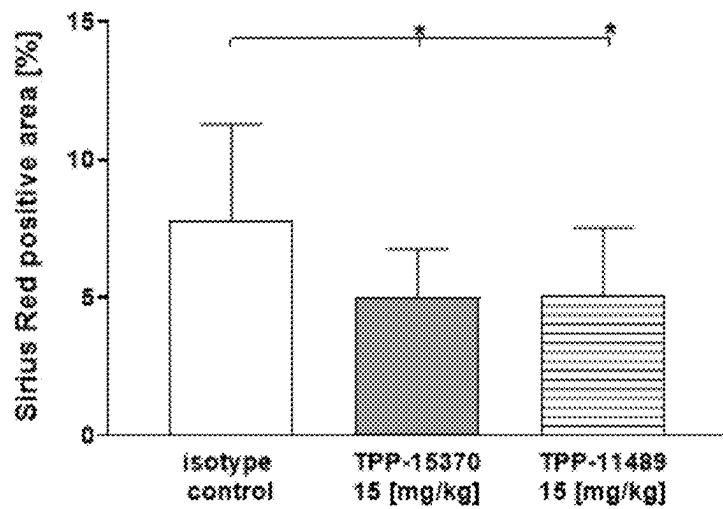


Fig. 9A

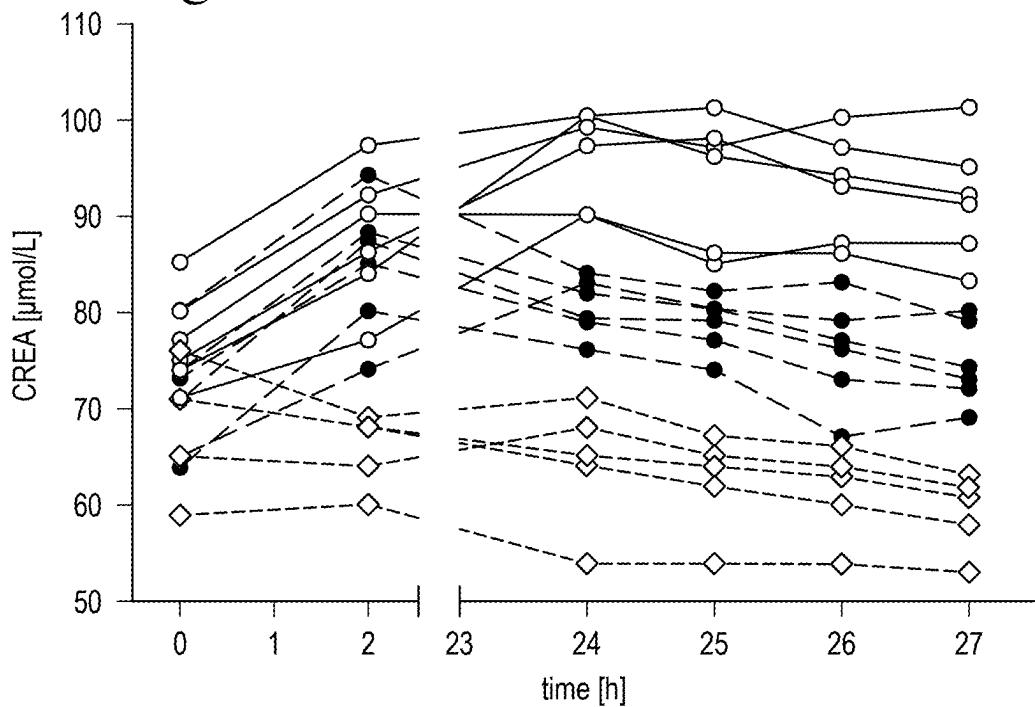
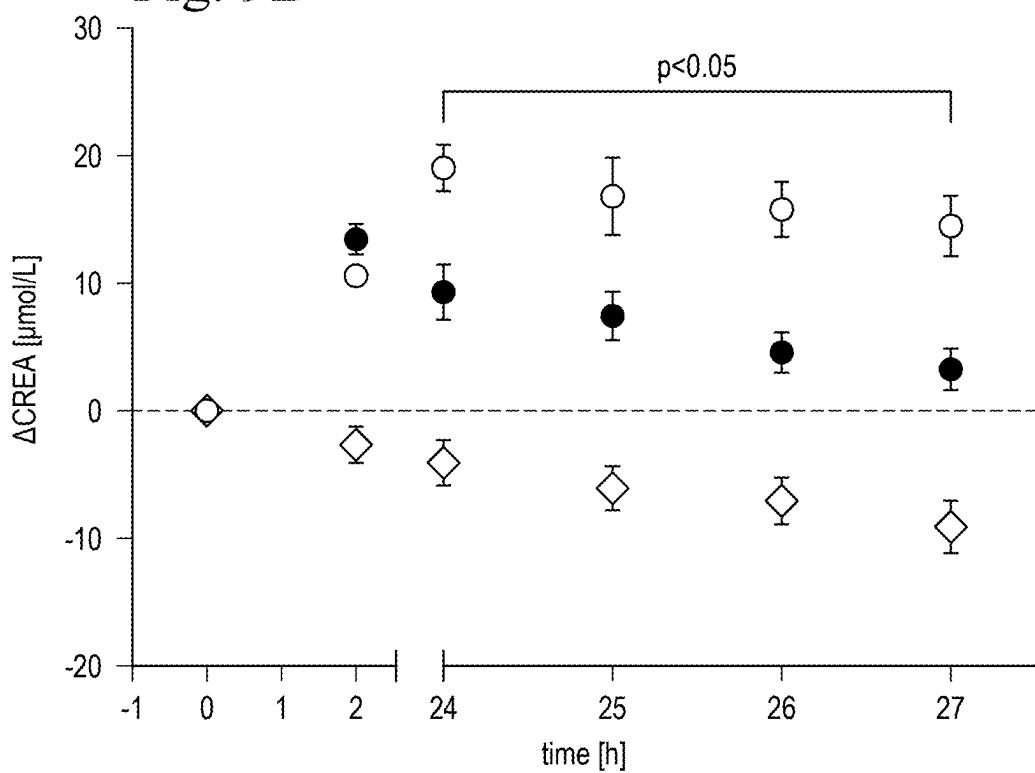
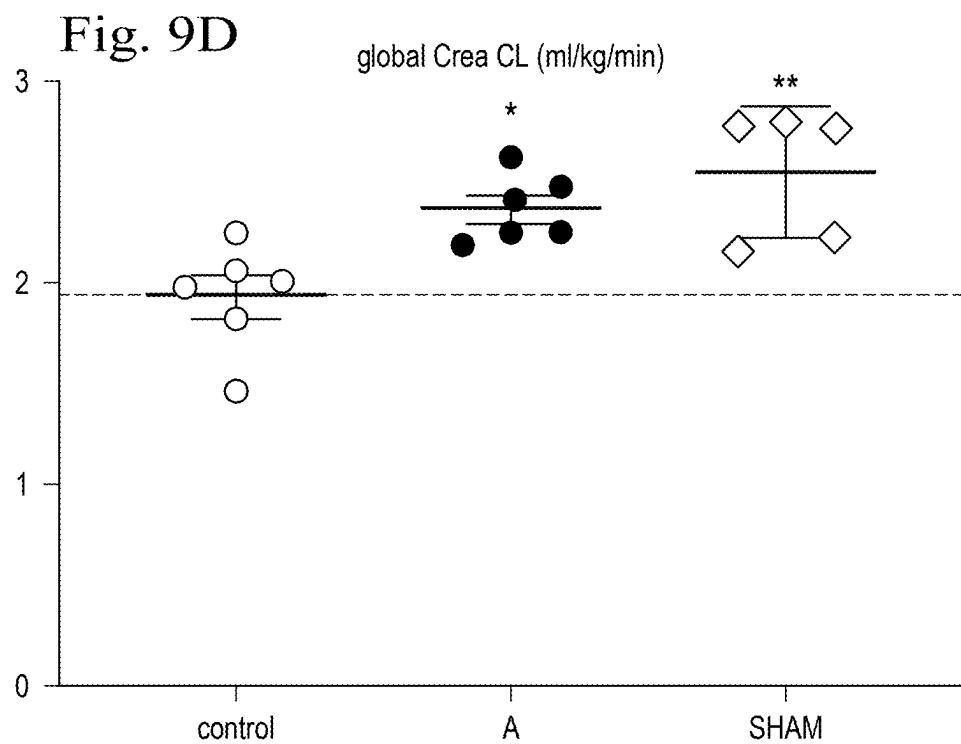
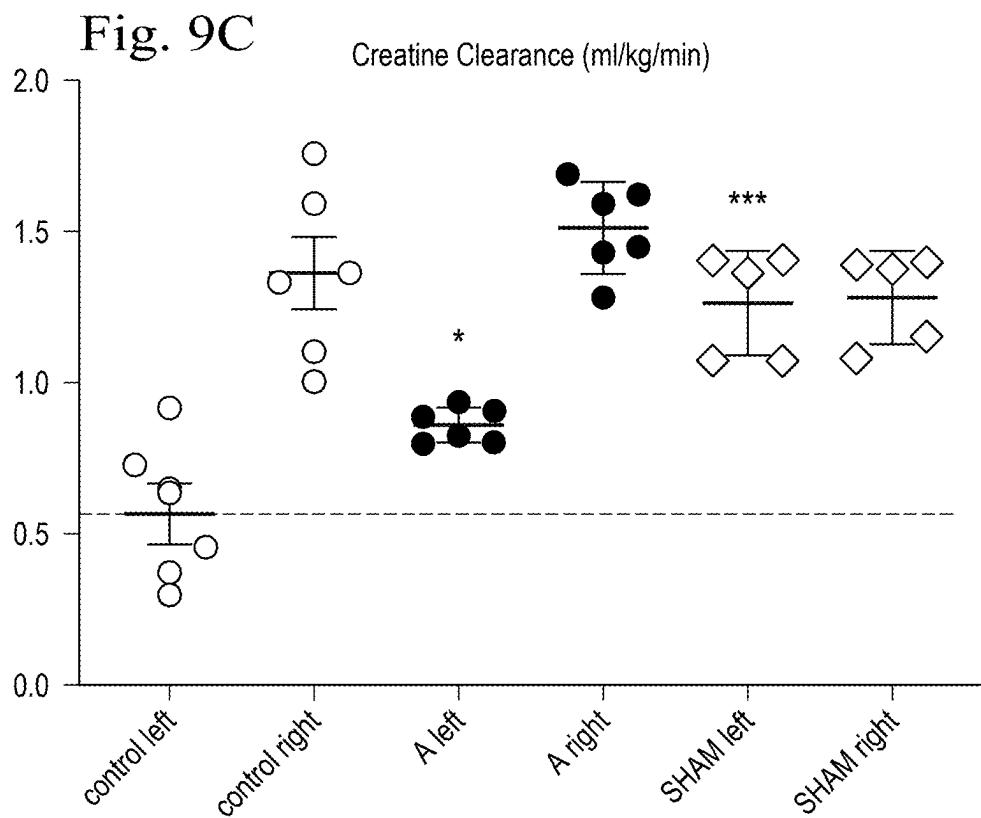


Fig. 9B





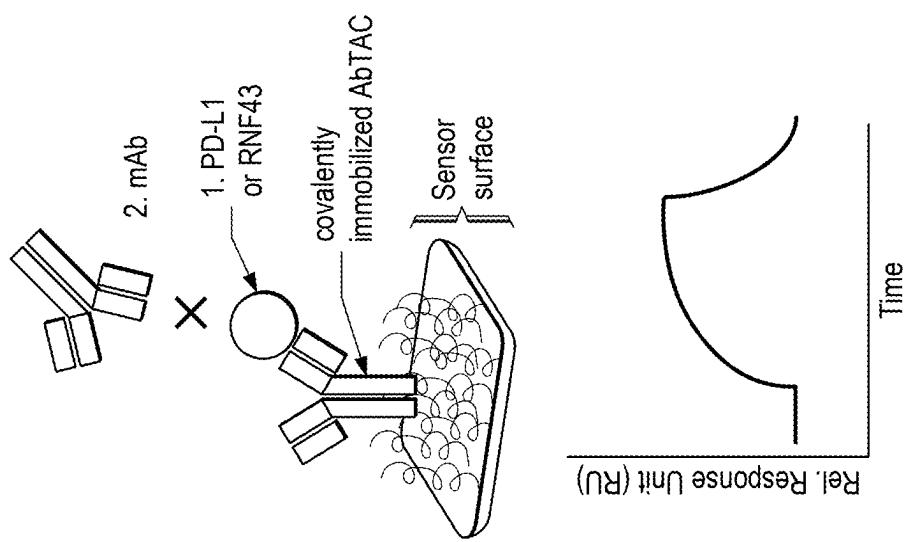


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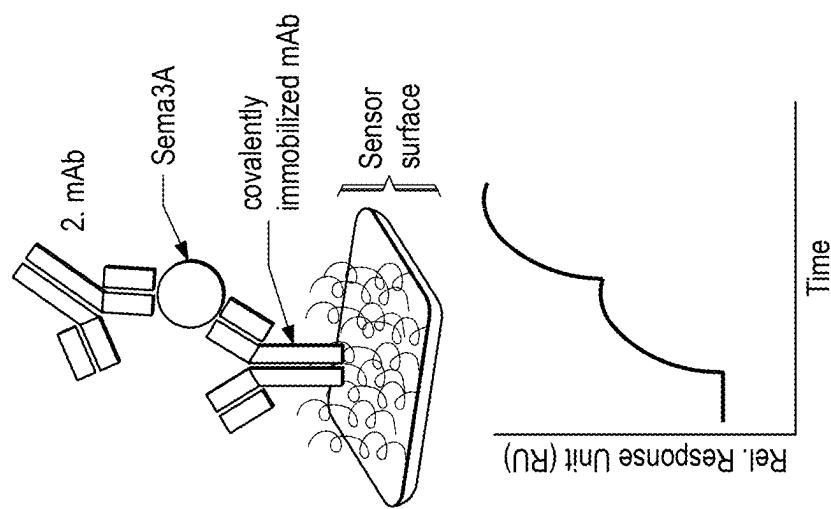


Fig. 10B

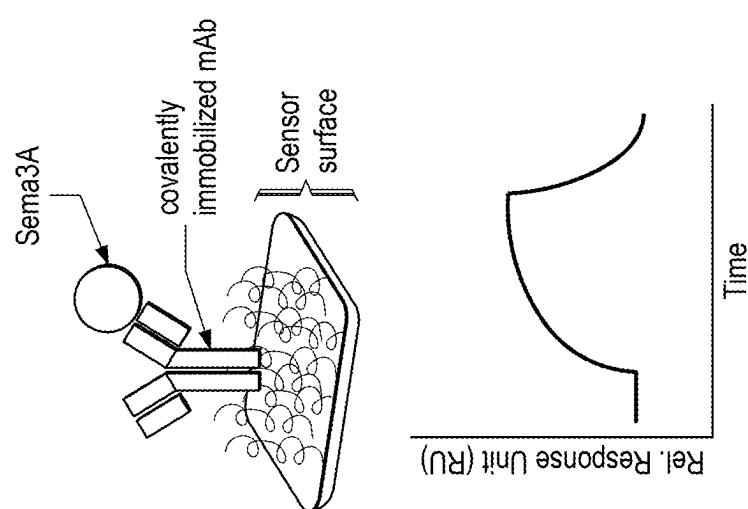


Fig. 10A

Fig. 11A

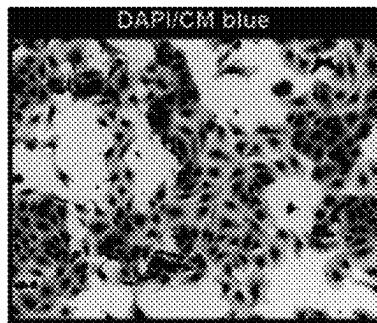


Fig. 11B

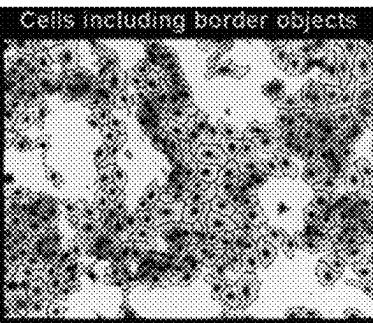


Fig. 11C

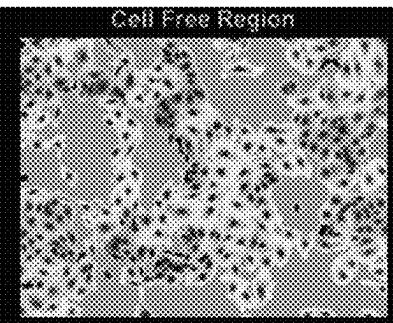
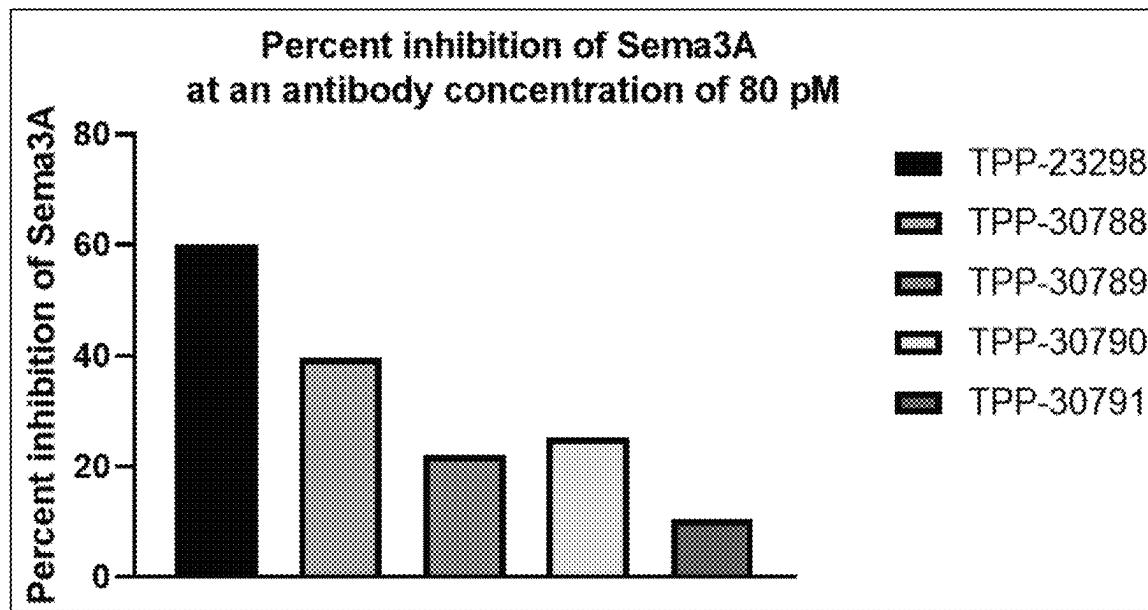


Fig. 12



1**ANTI-SEMAPHORIN 3A ANTIBODIES****CROSS-REFERENCE TO RELATED APPLICATION**

This application claims the benefit of, and priority to, European Patent Application Serial No. 21165960.2 filed Mar. 30, 2021, the entire disclosure of which is hereby incorporated by reference.

SEQUENCE LISTING

This application contains references to amino acid sequences and/or nucleic acid sequences which have been submitted concurrently herewith as the sequence listing text file entitled “Seqs3_BHC201071_FC_US_ST25.txt”, file size 596,189 bytes, created on Jun. 14, 2022. The aforementioned sequence listing is hereby incorporated by reference in its entirety pursuant to 37 C.F.R. § 1.52 (e) (5).

FIELD

The present disclosure provides isolated antibodies or antigen-binding fragments thereof that bind to human semaphorin 3A (Sema3A). The isolated antibody or antigen-binding fragments according to the present disclosure i) bind to human Sema3A of the sequence of SEQ ID NO: 600 with a dissociation constant (KD)≤50 nM, ≤20 nM, ≤10 nM, ≤1 nM, or ≤0.1 nM; ii) cross-react with mouse, cynomolgus, rat, pig and/or dog Sema3A, particularly wherein said isolated antibodies or antigen-binding fragments thereof binds to mouse, cynomolgus, rat, pig and/or dog Sema3A with a dissociation constant (KD)≤50 nM, ≤20 nM, ≤10 nM, ≤1 nM, or ≤0.1 nM; iii) bind to human Sema3A of the sequence of SEQ ID NO: 600 with a binding activity as measured by surface plasmon resonance (SPR) of ≥60%, ≥70%, ≥80%, or ≥90%; iv) inhibit the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro mesangial cell migration assay with an EC50 of ≤10 nM, ≤5 nM, ≤2.5 nM, or ≤1 nM; v) inhibit the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro growth cone collapse assay with an EC50 of ≤50 nM, ≤25 nM, ≤10 nM, or ≤5 nM; and/or vi) inhibit the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro HUVEC repulsion assay with an EC50 of ≤1 nM, or ≤0.3 nM, ≤0.1 nM, ≤0.07 nM, ≤0.06 nM and/or vii) exhibiting an increased potency against cellular Sema3A, of the sequence of SEQ ID NO: 600, induced HUVEC repulsion. The present disclosure further provides isolated nucleic acid sequences encoding said antibodies or antigen-binding fragments thereof and vectors comprising same, isolated cells expressing said antibodies or antigen-binding fragments thereof, methods of producing said antibodies or antigen-binding fragments thereof and pharmaceutical compositions and kits comprising said antibodies or antigen-binding fragments thereof.

Antibodies according to the present disclosure can be used in the treatment of diseases associated with increased Sema3A levels or activity such as Alport syndrome, acute kidney injury (AKI) primary focal segmental glomerular sclerosis (FSGS), or chronic kidney disease (CKD).

BACKGROUND

Semaphorin 3A (Sema3A) is a secreted dimeric protein that acts as guidance protein. It forms a ternary complex with neuropilin-1 and different plexins which leads to the activation of different signaling pathways. It is a key regu-

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lator of cell migration, adhesion, cytoskeletal stabilization and apoptosis. Sema3A is expressed in podocyte in adult kidneys where it is induced after injury.

Excess of Sema3A interferes with the glomerular filtration barrier inducing ultrastructural changes of the filtration barrier leading to podocyte foot process effacement and albuminuria. Sema3A is also highly induced after AKI and exacerbates the injury by promoting tubular inflammation, tubular epithelial cell apoptosis and ultrastructural abnormalities of the filtration barrier. Genetic deficiency or pharmacological inhibition of Sema3A in rodents results in reduced renal damage in different animal models of kidney diseases.

Furthermore, Sema3A is expressed in retinal neurons and endothelium. It has been shown to increase vascular permeability, to promote retinal inflammation and cellular senescence and to inhibit retinal vascular regeneration in rodent models. Sema3A also plays a role in CNS disorders. Sema3A inhibition results in enhanced regeneration and/or preservation of injured axons, decreased apoptotic cell numbers and enhancement of angiogenesis, resulting in considerably better functional recovery.

WO 20141/23186 discloses an avian-mouse chimeric antibody (clone No. 4-2 strain-derived) and two humanized IgG1 variants thereof and suggests their suitability in the treatment of Alzheimer's disease.

WO 2017/074013 discloses anti-Sema3A IgG antibodies A08, C10 and F11 and suggests their suitability in the treatment of cancer.

Currently, no therapeutic option to inhibit Sema3A interaction with its receptors is available to treat patients with e.g. proteinuric kidney disease like Alport syndrome and it is presumed that monoclonal therapeutic Sema3A antibodies could be optimally suited for this. Thus, there exists a great need for novel therapeutic Sema3A antibodies useful for the treatment of diseases that are associated with elevated Sema3A levels or activity such as Alport syndrome, acute kidney injury (AKI) primary focal segmental glomerular sclerosis (FSGS), or chronic kidney disease (CKD) that has not been met so far.

OBJECTS

In view of the prior art, it is an object of the present disclosure to provide novel therapeutic Sema3A antibodies that overcome the shortcomings of Sema3A antibodies of the prior art. In particular it is an object of the present disclosure to provide novel Sema3A antibodies that are high affinity binders of human Sema3A that efficiently block Sema3A activity. Desirable Sema3A antibodies are cross-reactive to Sema3A of multiple species in order to allow for preclinical experiments. They are non-immunogenic in human therapy, i.e. they are human or humanized antibodies. Desirable Sema3A antibodies are selective to Sema3A; they do not bind to off-targets and in particular do not cross-react with other semaphorin protein family members.

Such novel Sema3A antibodies would offer major advances in the treatment of diseases associated with elevated Sema3A levels or activity such as Alport syndrome, acute kidney injury (AKI) primary focal segmental glomerular sclerosis (FSGS), or chronic kidney disease (CKD).

SUMMARY

The above-mentioned object and other objects are achieved by the teaching of the present disclosure. The present disclosure is based on the discovery of novel anti-

bodies that have a specific affinity for Sema3A and can deliver a therapeutic benefit to a subject.

Thus, in a first aspect, the present disclosure relates to an isolated antibody or antigen-binding fragment thereof that binds to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof i) binds to human Sema3A of the sequence of SEQ ID NO: 600 with a dissociation constant (K_D) \leq 50 nM, \leq 20 nM, \leq 10 nM, \leq 1 nM, or \leq 0.1 nM; ii) cross-reacts with mouse, cynomolgus, rat, pig and/or dog Sema3A, particularly wherein said isolated antibody or antigen-binding fragment thereof binds to mouse, cynomolgus, rat, pig and/or dog Sema3A with a dissociation constant (K_D) \leq 50 nM, \leq 20 nM, \leq 10 nM, \leq 1 nM, or \leq 0.1 nM; iii) binds to human Sema3A of the sequence of SEQ ID NO: 600 with a binding activity as measured by surface plasmon resonance (SPR) of \geq 60%, \geq 70%, \geq 80%, or \geq 90%; iv) inhibits the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro mesangial cell migration assay with an EC₅₀ of \leq 10 nM, \leq 5 nM, \leq 2.5 nM, or \leq 1 nM; v) inhibits the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro growth cone collapse assay with an EC₅₀ of \leq 50 nM, \leq 25 nM, \leq 10 nM, or \leq 5 nM; vi) inhibits the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro HUVEC repulsion assay with an EC₅₀ of \leq 1 nM, or \leq 0.3 nM, \leq 0.1 nM, \leq 0.07 nM, \leq 0.06 nM and/or vii) exhibits an increased potency against cellular Sema3A, of the sequence of SEQ ID NO: 600, induced HUVEC repulsion.

The isolated antibody or antigen-binding fragment according to the present disclosure binds with high affinity to human Sema3A and inhibits its function. Thus, the isolated antibody or antigen-binding fragment according to the present disclosure may be used in the treatment of diseases associated with increased Sema3A levels or activity such as i) renal diseases, in particular acute and chronic kidney diseases, diabetic kidney diseases, Alport syndrome, acute and chronic renal failure, polycystic kidney disease (PCKD) and syndrome of inadequate ADH secretion (SIADH); ii) sequelae of renal insufficiency, in particular pulmonary edema, heart failure, uremia, anemia, electrolyte disturbances such as hyperkaliemia and hyponatremia and disturbances in bone and carbohydrate metabolism; iii) vascular hyperpermeability, diabetic retinopathy, deterioration of the blood retinal barrier, macular edema, particularly age related macular edema, non-proliferative age-related macular edema and non-proliferative diabetic macular edema; iv) diseases of the central or peripheral nervous system in particular neuropathic pain, spinal cord injury, multiple sclerosis, traumatic brain injury, brain edema and neurodegenerative diseases, particularly Alzheimer's disease, Parkinson's disease, Huntington's disease, amyotrophic lateral sclerosis, progressive supranuclear paralysis, black substance degeneration, Shy-Drager syndrome, olivo-pontocerebellar atrophy and spinocerebellar degeneration; v) cancer, in particular intestinal cancer, colorectal cancer, lung cancer, breast cancer, brain cancer, melanoma, renal cell cancer, leukemia, lymphoma, T-cell lymphoma, stomach cancer, pancreatic cancer, cervical cancer, endometrial cancer, ovarian cancer, esophageal cancer, liver cancer, squamous cell carcinoma of the head and neck, skin cancer, urinary tract cancer, prostate cancer, choriocarcinoma, pharyngeal cancer and larynx cancer.

The isolated antibody or antigen-binding fragment according to the present disclosure may further be used in the diagnosis of Sema3A-related disorders.

In a further aspect, the present disclosure relates to an isolated nucleic acid sequence that encodes the antibody or antigen-binding fragment according to the present disclosure.

5 In a further aspect, the present disclosure relates to a vector comprising a nucleic acid sequence according to the present disclosure.

10 In a further aspect, the present disclosure relates to an isolated cell expressing the antibody or antigen-binding fragment according to the present disclosure and/or comprising the nucleic acid according to the present disclosure or the vector according to the present disclosure.

15 In a further aspect, the present disclosure relates to a method of producing the isolated antibody or antigen-binding fragment according to the present disclosure comprising culturing of the cell according to the present disclosure and optionally purification of the antibody or antigen-binding fragment thereof.

20 In a further aspect, the present disclosure relates to a pharmaceutical composition comprising the isolated antibody or antigen-binding fragment according to the present disclosure or the antibody conjugate according to the present disclosure.

25 In a further aspect, the present disclosure relates to a kit comprising the isolated antibody or antigen-binding fragment according to the present disclosure or the conjugate according to the present disclosure and instructions for use.

DETAILED DESCRIPTION

30 The present disclosure may be understood more readily by reference to the following detailed description of the disclosure and the examples included therein.

Definitions

35 Unless defined otherwise, all technical and scientific terms used herein have the meaning commonly understood by one of ordinary skill in the art to which this disclosure belongs. The following references, however, can provide one of skill in the art to which this disclosure pertains with a general definition of many of the terms used in this disclosure, and can be referenced and used so long as such definitions are consistent with the meaning commonly understood in the art. Such references include, but are not limited to, Singleton et al., Dictionary of Microbiology and Molecular Biology (2nd ed. 1994); The Cambridge Dictionary of Science and Technology (Walker ed., 1988); Hale & Marham, The Harper Collins Dictionary of Biology (1991); 40 Lackie et al., The Dictionary of Cell & Molecular Biology (3d ed. 1999); and Cellular and Molecular Immunology, Eds. Abbas, Lichtman and Pober, 2nd Edition, W.B. Saunders Company. Any additional technical resource available to the person of ordinary skill in the art providing definitions of terms used herein having the meaning commonly understood in the art can be consulted. For the purposes of the present disclosure, the following terms are further defined. Additional terms are defined elsewhere in the description. As used herein and in the appended claims, the singular forms "a," and "the" include plural reference unless the context clearly dictates otherwise. Thus, for example, reference to "a gene" is a reference to one or more genes and includes equivalents thereof known to those skilled in the art, and so forth.

45 50 55 60 65 65 In the context of the present disclosure, the term "comprises" or "comprising" means "including, but not limited to". The term is intended to be open-ended, to specify the

presence of any stated features, elements, integers, steps or components, but not to preclude the presence or addition of one or more other features, elements, integers, steps, components or groups thereof. The term "comprising" thus includes the more restrictive terms "consisting of" and "essentially consisting of". In one embodiment the term "comprising" as used throughout the application and in particular within the claims may be replaced by the term "consisting of".

In this context, the term "about" or "approximately" means within 80% to 120%, alternatively within 90% to 110%, including within 95% to 105% of a given value or range.

The terms "polypeptide" and "protein" are used interchangeably herein to refer to a polymer of amino acid residues. The terms apply to amino acid polymers in which one or more amino acid residue is an artificial chemical mimetic of a corresponding naturally occurring amino acid, as well as to naturally occurring amino acid polymers and non-naturally occurring amino acid polymers. Unless otherwise indicated, a particular polypeptide sequence also implicitly encompasses conservatively modified variants thereof.

As used herein "Sema3A" designates "semaphorin 3A", also known as "HH16", "SemD", "COLL1", "SEMA1", "SEMAD", "SEMAL", "coll-1", "Hsema-I", "SEMAIII", "Hsema-III", "collapsin 1", "semaphorin D", "semaphorin III", and "semaphorin L".

The terms "anti-Sema3A antibody" and "an antibody that binds to Sema3A" refer to an antibody that is capable of binding Sema3A with sufficient affinity such that the antibody is useful as a diagnostic and/or therapeutic agent in targeting Sema3A. In one embodiment, the extent of binding of an anti-Sema3A antibody to an unrelated, non-Sema3A protein is less than about 10%, less than about 5%, or less than about 2% of the binding of the antibody to Sema3A as measured, e.g., by standard ELISA procedure. In certain embodiments, an antibody that binds to Sema3A has a binding activity (EC50) of $\leq 1 \mu\text{M}$, $\leq 100 \text{nM}$, $\leq 10 \text{nM}$, $\leq 1 \text{nM}$, $\leq 0.1 \text{nM}$, $\leq 0.01 \text{nM}$, or $\leq 0.001 \text{nM}$ (e.g. 10^{-8} M or less, e.g. from 10^{-8} M to 10^{-13} M , e.g., from 10^{-9} M to 10^{-13} M). In certain embodiments, an anti-Sema3A antibody binds to an epitope of Sema3A that is conserved among Sema3A from different species.

The term "antibody", as used herein, is intended to refer to immunoglobulin molecules. Antibodies may comprise four polypeptide chains, two heavy (H) chains (about 50-70 kDa) and two light (L) chains (about 25 kDa) which are typically inter-connected by disulfide bonds. In particular embodiments, the antibody is composed of two identical pairs of polypeptide chains. The amino-terminal portion of each chain includes a "variable" region of about 100 to 110 or more amino acids primarily responsible for antigen recognition. The heavy chain variable region is abbreviated herein as VH, the light chain variable region is abbreviated herein as VL. The carboxyl-terminal portion of each chain defines a constant region primarily responsible for effector function. The heavy chain constant region can comprise e.g. three domains CH1, CH2 and CH3. The light chain constant region is comprised of one domain (CL). The VH and VL regions can be further subdivided into regions of hypervariability, termed complementarity determining regions (CDR), interspersed with regions that are more conserved, termed framework regions (FR). Each VH and VL is typically composed of three CDRs and up to four FRs, arranged from amino-terminus to carboxy-terminus e.g., in the following order: FR1, CDR1, FR2, CDR2, FR3, CDR3, FR4.

As used herein, the term "Complementarity Determining Regions" (CDRs; e.g., CDR1, CDR2, and CDR3) refers to the amino acid residues of an antibody variable domain the presence of which are necessary for antigen binding. Each 5 variable domain typically has three CDR regions identified as CDR1, CDR2 and CDR3. Each complementarity determining region may comprise amino acid residues from a "complementarity determining region" as defined by Kabat (Kabat et al., Sequences of Proteins of Immunological

10 Interest, 5th Ed. Public Health Service, National Institutes of Health, Bethesda, MD. (1991)) and/or those residues from a "hypervariable loop" (Chothia and Lesk; J Mol Biol 196: 901-917 (1987)). In some instances, a complementarity determining region can include amino acids from both a 15 CDR region defined according to Kabat and a hypervariable loop.

"Framework" or FR residues are those variable domain residues other than the hypervariable region residues.

The phrase "constant region" refers to the portion of the 20 antibody molecule that confers effector functions.

The term "Fc region" herein is used to define a C-terminal region of an immunoglobulin heavy chain that contains at least a portion of the constant region. The term includes native sequence Fc regions and variant Fc regions. In one embodiment, a human IgG heavy chain Fc region extends from Cys226, or from Pro230, to the carboxyl-terminus of the heavy chain. However, the C-terminal lysine (Lys447) of the Fc region may or may not be present. Unless otherwise specified herein, numbering of amino acid residues in the Fc 25 region or constant region is according to the EU numbering system, also called the EU index, as described in Kabat et al., Sequences of Proteins of Immunological Interest, 5th Ed. Public Health Service, National Institutes of Health, Bethesda, MD, 1991.

30 Immunoglobulins can be assigned to different classes depending on the amino acid sequence of the constant domain of their heavy chains. Heavy chains are classified as mu (μ), delta (Δ), gamma (γ), alpha (α), and epsilon (ϵ), and define the antibody's isotype as IgM, IgD, IgG, IgA, and IgE, respectively. In particular embodiments, the antibody 35 according to the present disclosure is an IgG antibody. Several of these may be further divided into subclasses or isotypes, e.g. IgG1, IgG2, IgG3, IgG4, IgA1 and IgA2. In particular embodiments, the antibody according to the present disclosure is an IgG1, an IgG2, an IgG3 or an IgG4 antibody, more particularly an IgG1 or an IgG4 antibody. Different isotypes may have different effector functions. Human light chains are classified as kappa (K) and lambda (λ) light chains. Within light and heavy chains, the variable 40 and constant regions are joined by a "J" region of about 12 or more amino acids, with the heavy chain also including a "D" region of about 10 more amino acids. See generally, Fundamental Immunology, Ch. 7 (Paul, W., ed., 2nd ed. Raven Press, N.Y. (1989)).

45 A "functional fragment" or "antigen-binding antibody fragment" of an antibody/immunoglobulin hereby is defined as a fragment of an antibody/immunoglobulin (e.g., a variable region of an IgG) that retains the antigen-binding region. An "antigen-binding region" of an antibody typically 50 is found in one or more hyper variable region(s) of an antibody, e.g., the CDR1, -2, and/or -3 regions; however, the variable "framework" regions can also play an important role in antigen binding, such as by providing a scaffold for the CDRs. Preferably, the "antigen-binding region" comprises 55 at least amino acid residues 4 to 103 of the variable light (VL) chain and 5 to 109 of the variable heavy (VH) chain, more preferably amino acid residues 3 to 107 of VL

and 4 to 111 of VH, and particularly preferred are the complete VL and VH chains (amino acid positions 1 to 109 of VL and 1 to 113 of VH; numbering according to WO 97/08320).

Nonlimiting examples of “functional fragments” or “antigen-binding antibody fragments” include Fab, Fab', F(ab')₂, Fv fragments, domain antibodies (dAb), complementarity determining region (CDR) fragments, single-chain antibodies (scFv), single chain antibody fragments, diabodies, triabodies, tetrabodies, minibodies, linear antibodies (Zapata et al., Protein Eng., 8 (10): 1057-1062 (1995)); chelating recombinant antibodies, tribodies or bibodies, intrabodies, nanobodies, small modular immunopharmaceuticals (SMIPs), an antigen-binding-domain immunoglobulin fusion protein, a camelized antibody, a VHH containing antibody, or muteins or derivatives thereof, and polypeptides that contain at least a portion of an immunoglobulin that is sufficient to confer specific antigen binding to the polypeptide, such as a CDR sequence, as long as the antibody retains the desired biological activity; and multispecific antibodies such as bi- and tri-specific antibodies formed from antibody fragments (C. A. K Borrebaek, editor (1995) Antibody Engineering (Breakthroughs in Molecular Biology), Oxford University Press; R. Kontermann & S. Duebel, editors (2001) Antibody Engineering (Springer Laboratory Manual), Springer Verlag). An antibody other than a “bispecific” or “bifunctional” antibody is understood to have each of its binding sites identical. The F(ab')₂ or Fab may be engineered to minimize or completely remove the intermolecular disulfide interactions that occur between the C_{H1} and C_L domains. Papain digestion of antibodies produces two identical antigen-binding fragments, called “Fab” fragments, each with a single antigen-binding site, and a residual “Fc” fragment, whose name reflects its ability to crystallize readily. Pepsin treatment yields an F(ab')₂ fragment that has two “Fv” fragments. An “Fv” fragment is the minimum antibody fragment that contains a complete antigen recognition and binding site. This region consists of a dimer of one heavy- and one light-chain variable domain in tight, non-covalent association. It is in this configuration that the three CDRs of each variable domain interact to define an antigen binding site on the surface of the VH-VL dimer. Collectively, the six CDRs confer antigen-binding specificity to the antibody. However, even a single variable domain (or half of an Fv comprising only three CDRs specific for an antigen) has the ability to recognize and bind antigen.

“Single-chain Fv” or “sFv” or “scFv” antibody fragments comprise the VH and VL domains of antibody, wherein these domains are present in a single polypeptide chain.

Preferably, the Fv polypeptide further comprises a polypeptide linker between the VH and VL domains that enables the Fv to form the desired structure for antigen binding. For a review of Fvs see Pluckthun in The Pharmacology of Monoclonal Antibodies, vol. 113, Rosenburg and Moore eds., Springer-Verlag, New York, pp. 269-315 (1994).

The Fab fragment also contains the constant domain of the light chain and the first constant domain (CH1) of the heavy chain. Fab fragments differ from Fab' fragments by the addition of a few residues at the carboxyl terminus of the heavy chain CH1 domain including one or more cysteine residues from the antibody hinge region. Fab'-SH is the designation herein for Fab' in which the cysteine residue(s) of the constant domains bear a free thiol group. F(ab')₂ antibody fragments originally were produced as pairs of Fab' fragments which have hinge cysteine residues between them.

The term “mutein” or “variant” can be used interchangeably and refers to an antibody or antigen-binding fragment that contains at least one amino acid substitution, deletion, or insertion in the variable region or the portion equivalent to the variable region, provided that the mutein or variant retains the desired binding affinity or biological activity. Variants of the antibodies or antigen-binding antibody fragments contemplated in the disclosure are molecules in which the binding activity of the antibody or antigen-binding antibody fragment is maintained.

A “chimeric antibody” or antigen-binding fragment thereof is defined herein as one, wherein the variable domains are derived from a non-human origin and some or all constant domains are derived from a human origin.

“Humanized antibodies” contain CDR regions derived from a non-human species, such as mouse, that have, for example, been engrafted, along with any necessary framework back-mutations, into human sequence-derived V regions. Thus, for the most part, humanized antibodies are human immunoglobulins (recipient antibody) in which residues from a hypervariable region of the recipient are replaced by residues from a hypervariable region of a non-human species (donor antibody) such as mouse, rat, rabbit or non-human primate having the desired specificity, affinity, and capacity. See, for example, U.S. Pat. Nos. 5,225,539; 5,585,089; 5,693,761; 5,693,762; 5,859,205, each herein incorporated by reference. In some instances, framework residues of the human immunoglobulin are replaced by corresponding non-human residues (see, for example, U.S. Pat. Nos. 5,585,089; 5,693,761; 5,693,762, each herein incorporated by reference). Furthermore, humanized antibodies may comprise residues that are not found in the recipient antibody or in the donor antibody. These modifications are made to further refine antibody performance (e.g., to obtain desired affinity). In general, the humanized antibody will comprise substantially all of at least one, and typically two, variable domains, in which all or substantially all of the hypervariable regions correspond to those of a non-human immunoglobulin and all or substantially all of the framework regions are those of a human immunoglobulin sequence. The humanized antibody optionally also will comprise at least a portion of an immunoglobulin constant region (Fc), typically that of a human immunoglobulin. For further details see Jones et al., Nature 331:522-25 (1986); Riechmann et al., Nature 332:323-27 (1988); and Presta, Curr. Opin. Struct. Biol. 2:593-96 (1992), each herein incorporated by reference.

“Human antibodies” or “fully human antibodies” comprise human derived CDRs, i.e. CDRs of human origin.

Fully human antibodies may comprise a low number of germline deviations compared with the closest human germline reference determined based on the IMGT database (<http://www.imgt.org>). For example, a fully human antibody according to the current disclosure may comprise up to 1, 2, 3, 4, 5, 6, 7, 8, 9 or 10 germline deviations in the CDRs compared with the closest human germline reference. Fully human antibodies can be developed from human derived B cells by cloning techniques in combination with a cell enrichment or immortalization step. The majority of fully human antibodies, however, are isolated either from immunized mice transgenic for the human IgG locus or from sophisticated combinatorial libraries by phage display (Brüggemann M., Osborn M. J., Ma B., Hayre J., Avis S., Lundstrom B. and Buelow R., Human Antibody Production in Transgenic Animals, Arch Immunol Ther Exp (Warsz.) 63 (2015), 101-108; Carter P. J., Potent antibody therapeutics by design, Nat Rev Immunol 6 (2006), 343-357; Frenzel A.,

Schirrmann T. and Hust M., Phage display-derived human antibodies in clinical development and therapy, MAbs 8 (2016), 1177-1194; Nelson A. L., Dhimolea E. and Reichert J. M., Development trends for human monoclonal antibody therapeutics, Nat Rev Drug Discov 9 (2010), 767-774.).

Several techniques are available to generate fully human antibodies (cf. WO2008/112640 A3). Cambridge Antibody Technologies (CAT) and Dyax have obtained antibody cDNA sequences from peripheral B cells isolated from immunized humans and devised phage display libraries for the identification of human variable region sequences of a particular specificity. Briefly, the antibody variable region sequences are fused either with the Gene III or Gene VIII structure of the M13 bacteriophage. These antibody variable region sequences are expressed either as Fab or single chain Fv (scFv) structures at the tip of the phage carrying the respective sequences. Through rounds of a panning process using different levels of antigen binding conditions (stringencies), phages expressing Fab or scFv structures that are specific for the antigen of interest can be selected and isolated. The antibody variable region cDNA sequences of selected phages can then be elucidated using standard sequencing procedures. These sequences may then be used for the reconstruction of a full antibody having the desired isotype using established antibody engineering techniques. Antibodies constructed in accordance with this method are considered fully human antibodies (including the CDRs). In order to improve the immunoreactivity (antigen binding affinity and specificity) of the selected antibody, an in vitro maturation process can be introduced, including a combinatorial association of different heavy and light chains, deletion/addition/mutation at the CDR3 of the heavy and light chains (to mimic V-J, and V-D-J recombination), and random mutations (to mimic somatic hypermutation). An example of a “fully human” antibody generated by this method is the anti-tumor necrosis factor α antibody, Humira (adalimumab).

“Human EngineeredTM” antibodies generated by altering the parent sequence according to the methods set forth in Studnicka et al., U.S. Pat. No. 5,766,886.

An antibody of the disclosure may be derived from a recombinant antibody gene library. The development of technologies for making repertoires of recombinant human antibody genes, and the display of the encoded antibody fragments on the surface of filamentous bacteriophage, has provided a recombinant means for directly making and selecting human antibodies, which also can be applied to humanized, chimeric, murine or mutein antibodies. The antibodies produced by phage technology are produced as antigen binding fragments—usually Fv or Fab fragments—in bacteria and thus lack effector functions. Effector functions can be introduced by one of two strategies: The fragments can be engineered either into complete antibodies for expression in mammalian cells, or into bispecific antibody fragments with a second binding site capable of triggering an effector function. Typically, heavy chain VH-CH1 and light chain VL-CL of antibodies are separately cloned by PCR and recombined randomly in combinatorial phage display libraries, which can then be selected for binding to a particular antigen. The Fab fragments are expressed on the phage surface, i.e., physically linked to the genes that encode them. Thus, selection of Fab by antigen binding co-selects for the Fab encoding sequences, which can be amplified subsequently. By several rounds of antigen binding and re-amplification, a procedure termed panning, Fab specific for the antigen are enriched and finally isolated.

A variety of procedures have been described for human antibodies deriving from phage-display libraries. Such libraries may be built on a single master framework, into which diverse in vivo-formed (i. e. human-derived) CDRs are allowed to recombine as described by Carlsson and Söderlind Exp. Rev. Mol. Diagn. 1 (1), 102-108 (2001), Söderlin et al., Nat. Biotech. 18, 852-856 (2000) and U.S. Pat. No. 6,989,250. Alternatively, such an antibody library may be based on amino acid sequences that have been designed in silico and encoded by nucleic acids that are synthetically created. In silico design of an antibody sequence is achieved, for example, by analyzing a database of human sequences and devising a polypeptide sequence utilizing the data obtained therefrom. Methods for designing and obtaining in silico-created sequences are described, for example, in Knappik et al., J. Mol. Biol. (2000) 296:57; Krebs et al., J. Immunol. Methods. (2001) 254: 67; and U.S. Pat. No. 6,300,064. For a review of phage display screening (for example see Hoet R M et al, Nat Biotechnol 2005; 23 (3): 344-8), the well-established hybridoma technology (for example see Köhler and Milstein Nature. 1975 Aug. 7; 256 (5517): 495-7), or immunization of mice inter alia immunization of hMAb mice (e.g. VelocImmune Mouse®).

The term “monoclonal antibody” as used herein refers to an antibody obtained from a population of substantially homogeneous antibodies, i.e., the individual antibodies comprising the population are identical except for possible mutations, e.g., naturally occurring mutations, that may be present in minor amounts. Thus, the term “monoclonal” indicates the character of the antibody as not being a mixture of discrete antibodies. In contrast to polyclonal antibody preparations, which typically include different antibodies directed against different determinants (epitopes), each monoclonal antibody of a monoclonal antibody preparation is directed against a single determinant on an antigen. In addition to their specificity, monoclonal antibody preparations are advantageous in that they are typically uncontaminated by other immunoglobulins. The term “monoclonal” is not to be construed as to require production of the antibody by any particular method. For example, the monoclonal antibodies to be used may be made by the hybridoma method first described by Kohler et al., Nature, 256:495 [1975, or may be made by recombinant DNA methods (see, e.g., U.S. Pat. No. 4,816,567). The “monoclonal antibodies” may also be recombinant, chimeric, humanized, human, Human EngineeredTM, or antibody fragments, for example.

An “isolated” antibody is one that has been identified and separated from a component of the cell that expressed it. Contaminant components of the cell are materials that would interfere with diagnostic or therapeutic uses of the antibody, and may include enzymes, hormones, and other proteinaceous or non-proteinaceous solutes.

An “isolated” nucleic acid is one that has been identified and separated from a component of its natural environment. An isolated nucleic acid includes a nucleic acid molecule contained in cells that ordinarily contain the nucleic acid molecule, but the nucleic acid molecule is present extrachromosomally or at a chromosomal location that is different from its natural chromosomal location.

As used herein, an antibody “binds specifically to”, is “specific to/for” or “specifically recognizes” an antigen of interest, e.g. Sema3A, is one that binds the antigen with sufficient affinity such that the antibody is useful as a therapeutic agent in targeting a cell or tissue expressing the antigen. The term “specifically recognizes” or “binds specifically to” or is “specific to/for” a particular polypeptide or an epitope on a particular polypeptide target as used herein

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can be exhibited, for example, by an antibody, or antigen-binding fragment thereof, having a monovalent K_D for the antigen of less than about 10^{-4} M, alternatively less than about 10^{-5} M, alternatively less than about 10^{-6} M, alternatively less than about 10^{-7} M, alternatively less than about 10^{-8} M, alternatively less than about 10^{-9} M, alternatively less than about 10^{-10} M, alternatively less than about 10^{-11} M, alternatively less than about 10^{-12} M, or less.

An antibody “binds selectively to,” is “selective to/for” or “selectively recognizes” an antigen if such antibody is able to discriminate between such antigen and one or more reference antigen(s). In particular, an antibody that “binds selectively to” an antigen does not significantly cross-react with proteins other than orthologs and variants (e.g. mutant forms, splice variants, or proteolytically truncated forms) of the aforementioned antigen target. In its most general form, “selective binding”, “binds selectively to”, is “selective to/for” or “selectively recognizes” is referring to the ability of the antibody to discriminate between the antigen of interest and an unrelated antigen, as determined, for example, in accordance with one of the following methods. Such methods comprise but are not limited to surface plasmon resonance (SPR), Western blots, ELISA-, RIA-, ECL-, IRMA-tests and peptide scans. For example, a standard ELISA assay can be carried out. The scoring may be carried out by standard color development (e.g. secondary antibody with horseradish peroxidase and tetramethyl benzidine with hydrogen peroxide). The reaction in certain wells is scored by the optical density, for example, at 450 nm. Typical background (=negative reaction) may be 0.1 OD; typical positive reaction may be 1 OD. This means the difference positive/negative is more than 5-fold, 10-fold, 50-fold, and preferably more than 100-fold. Typically, determination of binding selectivity is performed by using not a single reference antigen, but a set of about three to five unrelated antigens, such as milk powder, BSA, transferrin or the like.

“Binding affinity” or “affinity” refers to the strength of the total sum of non-covalent interactions between a single binding site of a molecule and its binding partner. Unless indicated otherwise, as used herein, “binding affinity” refers to intrinsic binding affinity which reflects a 1:1 interaction between members of a binding pair (e.g. an antibody and an antigen). The dissociation constant “ K_D ” is commonly used to describe the affinity between a molecule (such as an antibody) and its binding partner (such as an antigen) i.e. how tightly a ligand binds to a particular protein. Ligand-protein affinities are influenced by non-covalent intermolecular interactions between the two molecules. Affinity can be measured by common methods known in the art, including those described herein. In one embodiment, the “ K_D ” or “ K_D value” according to this disclosure is measured by using surface plasmon resonance assays using a Biacore T200 instrument (GE Healthcare Biacore, Inc.). Other suitable devices are BIACORE T100, BIACORE (R)-2000, BIACORE 4000, a BIACORE (R)-3000 (Biacore, Inc., Piscataway, NJ), or ProteOn XPR36 instrument (Bio-Rad Laboratories, Inc.).

As used herein, the term “epitope” includes any protein determinant capable of specific binding to an immunoglobulin or T-cell receptor. Epitopic determinants usually consist of chemically active surface groupings of molecules such as amino acids or sugar side chains, or combinations thereof and usually have specific three-dimensional structural characteristics, as well as specific charge characteristics.

An “antibody that binds to the same epitope” as a reference antibody or “an antibody which competes for binding”

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to a reference antibody refers to an antibody that blocks binding of the reference antibody to its antigen in a competition assay by 10%, 20%, 30%, 40%, 50% or more, and conversely, the reference antibody blocks binding of the antibody to its antigen in a competition assay by 10%, 20%, 30%, 40%, 50% or more.

The term “matured antibodies” or “matured antigen-binding fragments” such as matured Fab variants or “optimized” variants includes derivatives of an antibody or antibody fragment exhibiting stronger binding—i. e. binding with increased affinity—to a given antigen such as the extracellular domain of a target protein. Maturation is the process of identifying a small number of mutations within the six CDRs of an antibody or antibody fragment leading to this affinity increase. The maturation process is the combination of molecular biology methods for introduction of mutations into the antibody and screening for identifying the improved binders.

“Percent (%) sequence identity” with respect to a reference polynucleotide or polypeptide sequence, respectively, is defined as the percentage of nucleic acid or amino acid residues, respectively, in a candidate sequence that are identical with the nucleic acid or amino acid residues, respectively, in the reference polynucleotide or polypeptide sequence, respectively, after aligning the sequences and introducing gaps, if necessary, to achieve the maximum percent sequence identity. Conservative substitutions are not considered as part of the sequence identity. Preferred are un-gapped alignments. Alignment for purposes of determining percent amino acid sequence identity can be achieved in various ways that are within the skill in the art, for instance, using publicly available computer software such as BLAST, BLAST-2, ALIGN or Megalign (DNASTAR) software. Those skilled in the art can determine appropriate parameters for aligning sequences, including any algorithms needed to achieve maximal alignment over the full length of the sequences being compared.

“Sequence homology” indicates the percentage of amino acids that either is identical or that represent conservative amino acid substitutions.

An “antagonistic” antibody or a “blocking” antibody is one which significantly inhibits (either partially or completely) a biological activity of the antigen it binds. In particular embodiments, the antibody or antigen-binding fragment according to the present disclosure is a Sema3A blocking antibody or antigen-binding fragment thereof.

The term “antibody conjugate” refers to an antibody conjugated to one or more molecules including drugs—in which case the antibody conjugate is referred to as “antibody-drug conjugate” (“ADC”)—and high molecular weight molecules such as peptides or proteins.

The term “antibody-drug conjugate” or “ADC” refers to an antibody conjugated to one or more cytotoxic or cytostatic agents, such as a chemotherapeutic agent, a drug, a growth inhibitory agent, a toxin (e.g., a protein toxin, an enzymatically active toxin of bacterial, fungal, plant, or animal origin, or fragments thereof), or a radioactive isotope (i.e., a radioconjugate). Immunoconjugates have been used for the local delivery of cytotoxic agents, i.e., drugs that kill or inhibit the growth or proliferation of cells, in the treatment of cancer (e.g. Liu et al., Proc Natl. Acad. Sci. (1996), 93, 8618-8623)). Immunoconjugates allow for the targeted delivery of a drug moiety to a tumor, and intracellular accumulation therein, where systemic administration of unconjugated drugs may result in unacceptable levels of toxicity to normal cells and/or tissues. Toxins used in antibody-toxin conjugates include bacterial toxins such as

diphtheria toxin, plant toxins such as ricin, small molecule toxins such as geldanamycin. The toxins may exert their cytotoxic effects by mechanisms including tubulin binding, DNA binding, or topoisomerase inhibition.

Amino acids may be referred to herein by their commonly known three letter symbols or by the one-letter symbols recommended by the IUPAC-IUB Biochemical Nomenclature Commission. Nucleotides, likewise, may be referred to by their commonly accepted single-letter codes.

The term "vector", as used herein, refers to a nucleic acid molecule capable of propagating another nucleic acid to which it is linked. The term includes the vector as a self-replicating nucleic acid structure as well as the vector incorporated into the genome of a host cell into which it has been introduced. Certain vectors are capable of directing the expression of nucleic acids to which they are operatively linked. Such vectors are referred to herein as "expression vectors."

The terms "host cell", "host cell line", and "host cell culture" are used interchangeably and refer to cells into which at least one exogenous nucleic acid has been introduced, including the progeny of such cells. Host cells include "transformants" and "transformed cells", "transfectants" and "transfected cells" and "transduced cells" which include the primary transformed/transfected/transduced cell and progeny derived therefrom without regard to the number of passages. Progeny may not be completely identical in nucleic acid content to a parent cell but may contain mutations. Mutant progeny that have the same function or biological activity as screened or selected for in the originally transformed cell are included herein.

As used herein, the phrase "therapeutically effective amount" is meant to refer to an amount of therapeutic or prophylactic antibody that would be appropriate to elicit the desired therapeutic or prophylactic effect or response, including alleviating some or all of such symptoms of disease or reducing the predisposition to the disease, when administered in accordance with the desired treatment regimen.

The term "pharmaceutical formulation"/"pharmaceutical composition" refers to a preparation which is in such form as to permit the biological activity of an active ingredient contained therein to be effective, and which contains no additional components which are unacceptably toxic to a subject to which the formulation would be administered.

Antibodies According to the Present Disclosure

In one aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof binds to human Sema3A of the sequence of SEQ ID NO: 600 with a dissociation constant (KD) \leq 50 nM, \leq 20 nM, \leq 10 nM, \leq 1 nM, or \leq 0.1 nM. In particular embodiments, the isolated antibody or antigen-binding fragment thereof binds to the His-tagged human Sema3A domain of SEQ ID NO: 582 with a dissociation constant (KD) \leq 50 nM, \leq 20 nM, \leq 10 nM, \leq 1 nM, or \leq 0.1 nM.

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof cross-reacts with mouse, cynomolgus, rat, pig and/or dog Sema3A, particularly wherein said isolated antibody or antigen-binding fragment thereof binds to mouse, cynomolgus, rat, pig and/or dog Sema3A with a dissociation constant (KD) \leq 50 nM, \leq 20 nM, \leq 10 nM, \leq 1 nM, or \leq 0.1 nM.

In particular such embodiments, said affinities are to mouse Sema3A of SEQ ID NO: 601, to cynomolgus Sema3A of SEQ ID NO: 602, to rat Sema3A of SEQ ID NO: 603, to pig Sema3A of SEQ ID NO: 604 and to dog Sema3A of SEQ ID NO: 605. In particular embodiments, said affinities are to His-tagged mouse Sema3A domain of SEQ ID NO: 583, to His-tagged cynomolgus Sema3A domain of SEQ ID NO: 586, to His-tagged rat Sema3A domain of SEQ ID NO: 584, to His-tagged pig Sema3A domain of SEQ ID NO: 587 and to His-tagged dog Sema3A domain of SEQ ID NO: 585.

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof binds to human Sema3A with a binding activity as measured by surface plasmon resonance (SPR) of \geq 60%, \geq 70%, \geq 80%, or \geq 90%. In particular embodiments, the isolated antibody or antigen-binding fragment thereof binds to human Sema3A of the sequence of SEQ ID NO: 600 with a binding activity as measured by surface plasmin resonance (SPR) of \geq 60%, \geq 70%, \geq 80%, or \geq 90%. In particular embodiments, the isolated antibody or antigen-binding fragment thereof binds to His-tagged human Sema3A domain of the sequence of SEQ ID NO: 582 with a binding activity as measured by surface plasmin resonance (SPR) of \geq 60%, \geq 70%, \geq 80%, or \geq 90%.

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof inhibits the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro mesangial cell migration assay with an EC50 of \leq 10 nM, \leq 5 nM, \leq 2.5 nM, or \leq 1 nM.

In particular, the isolated antibody or antigen-binding fragment according to the present disclosure inhibits the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro scratch assay using human primary mesangial cells and described in more detail in Example 9.

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof inhibits the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro growth cone collapse assay with an EC50 of \leq 50 nM, \leq 25 nM, \leq 10 nM, or \leq 5 nM.

In particular, the isolated antibody or antigen-binding fragment according to the present disclosure inhibits Sema3A-induced cytoskeletal collapse in an in vitro growth cone collapse assay using mouse dorsal root ganglion (DRG) neurons as described in more detail in Example 10. The in vitro growth cone assay described in Example 10 is a modified version of the growth cone assay described in Mikule et al. (PMID: 12077190).

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof inhibits the activity of human Sema3A of the sequence of SEQ ID NO: 600 in an in vitro HUVEC repulsion assay with an EC50 of \leq 1 nM, or \leq 0.3 nM, \leq 0.1 nM, \leq 0.07 nM, \leq 0.06 nM.

In particular, the isolated antibody or antigen-binding fragment according to the present disclosure inhibits Sema3A induced cell repulsion in an in vitro repulsion assay using Sema3A, of the sequence of SEQ ID NO: 600,

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expressing HEK293 cells seeded on a confluent monolayer of human umbilical vein endothelial cells (HUVEC) as described in Example 11.

In a further aspect, the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to Sema3A, of the sequence of SEQ ID NO: 600, wherein said isolated antibody or antigen-binding fragment thereof exhibits an improved potency in HUVEC repulsion assay; i) wherein said isolated antibody or antigen-binding fragment thereof exhibits an improved potency in HUVEC repulsion assay in comparison to TPP-17755 with SEQ IDs 81, 85, 97, 98, or to TPP-11489 with SEQ IDs 1, 5, 17, 18, or to TPP-30788 with SEQ IDs 800, 804, 810, 811, or to TPP-30789 with SEQ IDs 814, 818, 824, 825, or to TPP-30790 with SEQ IDs 828, 832, 838, 839, or to TPP-30791 with SEQ IDs 842, 846, 852, 853; ii) wherein said isolated antibody or antigen-binding fragment thereof exhibits preferably a >400-fold, preferably a >50-fold, preferably >5-fold, preferably >2-fold increased potency against cellular Sema3A induced HUVEC repulsion based on the EC-50 values, in comparison to TPP-17755 with SEQ IDs 81, 85, 97, 98, or to TPP-11489 with SEQ IDs 1, 5, 17, 18, or to TPP-30788 with SEQ IDs 800, 804, 810, 811, or to TPP-30789 with SEQ IDs 814, 818, 824, 825, or to TPP-30790 with SEQ IDs 828, 832, 838, 839, or to TPP-30791 with SEQ IDs 842, 846, 852, 853; iii) wherein said isolated antibody or antigen-binding fragment thereof exhibits at least a 30% increased percent inhibition, preferably at least 50% increased percent inhibition of Sema3A in comparison to TPP-17755, to TPP-11489, to TPP-30788, to TPP-30789, TPP-30790, or to TPP-30791, with aforementioned sequences; iv) wherein said isolated antibody or antigen-binding fragment thereof has a two-digit picomolar activity against human Sema3A in vitro HUVEC repulsion assay, while prior art antibody potencies of TPP-17755, TPP-11489, TPP-30788, TPP-30789, TPP-30790, or TPP-30791, with aforementioned sequences, are in the three-digit picomolar or even nanomolar range; v) wherein said isolated antibody or antigen-binding fragment thereof inhibits the activity of human Sema3A in an in vitro HUVEC repulsion assay with an EC50 of ≤1 nM, or ≤0.3 nM, ≤0.1 nM, ≤0.07 nM, ≤0.06 nM, as described in Example 11.

The isolated antibody or antigen-binding fragment of the present disclosure show an improved potency in HUVEC repulsion assay compared to TPP-30788-TPP-30791 (BI clone I to IV), which might be due to a binding to a different epitope of human Sema3A.

In another aspect, the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to Sema3A, wherein said isolated antibody or antigen-binding fragment thereof inhibits the activity of Sema3A in vivo, since the antibodies according to the present disclosure reduce Sema3A-induced urinary Albumin excretion. Thus in a further aspect, the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to Sema3A, wherein said isolated antibody or antigen-binding fragment thereof exhibits an improved inhibitory activity of Sema3A in vivo, i) wherein said the antibodies exhibit an increased reduction of Sema3A-induced urinary Albumin excretion compared to TPP-30788 (BI clone I); ii) wherein said the antibodies exhibit an increased reduction of Sema3A-induced urinary Albumin excretion compared to TPP-17755 (Samsung); iii) wherein said the antibodies exhibit an increased reduction of Sema3A-induced urinary Albumin excretion compared to TPP-11489 (Chiome) as described in Example 12.

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The isolated antibody or antigen-binding fragment of the present disclosure show an improved efficacy in an in vivo model for induced urinary Albumin excretion compared to TPP-30788-TPP-30791 (BI clone I to IV), which might be due to a binding to a different epitope of human Sema3A.

Thus, in a further aspect, the present disclosure relates to an isolated antibody or antigen-binding fragment thereof that binds to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof i) exhibits an increased stability (e.g. increased stress-stability when diluted in PBS to 25 mg/ml and incubated at 700 rpm and 40° C. for two weeks) compared to TPP-30788 (BI clone I); ii) wherein the increased stability exhibits an increased amount of monomeric anti-Sema3A antibody compared to TPP-30788 (BI clone I) measured by SEC; iii) wherein the increased stability exhibits a decreased percentage of the LC and HC of the anti-Sema3A antibody compared to TPP-30788 (BI clone I) measured by cGE, proving a reduced rate of degradation which is measured by the presence of remaining LC and HC, iv) wherein the increased stability exhibits that the amount of monomeric anti-Sema3A antibody is maintained, e.g. Δ % monomer=1 after the incubation at 40° C., 700 rpm for two weeks; v) wherein the increased stability exhibits that the amount of LC and HC of the anti-Sema3A antibody is maintained e.g. Δ % LC+HC<1 after the incubation at 40° C., 700 rpm for two weeks.

Thus, in a further aspect, the present disclosure relates to TPP-23298, that binds to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof i) exhibits an increased stability (e.g. increased stress-stability when diluted in PBS to 25 mg/ml and incubated at 700 rpm and 40° C. for two weeks) compared to TPP-30788 (BI clone I); ii) wherein the increased stability exhibits an increased amount of monomeric anti-Sema3A antibody compared to TPP-30788 (BI clone I) measured by SEC; iii) wherein the increased stability exhibits a decreased percentage of the LC and HC of the anti-Sema3A antibody compared to TPP-30788 (BI clone I) measured by cGE, proving a reduced rate of degradation which is measured by the presence of remaining LC and HC, iv) wherein the increased stability exhibits that the amount of monomeric anti-Sema3A antibody is maintained, e.g. Δ % monomer=1 after the incubation at 40° C., 700 rpm for two weeks; v) wherein the increased stability exhibits that the amount of LC and HC of the anti-Sema3A antibody is maintained e.g. Δ % LC+HC<1 after the incubation at 40° C., 700 rpm for two weeks.

Thus, in a further aspect, the present disclosure relates to an isolated antibody or antigen-binding fragment thereof that binds to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof i) exhibits an increased solubility; ii) wherein the increased solubility is measured in mg/ml after concentration at 90% recovery; iii) wherein the solubility is increased compared to TPP-30788 (BI clone I); iv) wherein the solubility is increased ≤1 fold, ≤1.5 fold, ≤2 fold compared to TPP-30788 (BI clone I); v) wherein the increased solubility exhibits that the percentage of monomeric anti-Sema3A antibody is not increased after concentration e.g. Δ monomer <1 measured by SEC.

Thus, in a further aspect, the present disclosure relates to TPP-23298, that binds to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof i) exhibits an increased solubility; ii) wherein the increased solubility is measured in mg/ml after concentration at 90% recovery; iii) wherein the solubility is increased compared to TPP-30788 (BI clone I); iv) wherein the solubility is increased ≤1 fold, ≤1.5 fold, ≤2 fold compared to TPP-

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30788 (BI clone I); v) wherein the increased solubility exhibits that the percentage of monomeric anti-Sema3A antibody is not increased after concentration e.g. Δ % monomer<1 measured by SEC.

Thus, in a further aspect, the present disclosure relates to an isolated antibody or antigen-binding fragment thereof that binds to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof i) exhibits an increased viscosity compared to water or PBS; ii) exhibits a reduced viscosity in PBS compared to TPP-30788 (BI clone I); iii) wherein the viscosity is measured by a Viscosizer and exhibits a cP value of 5.1 (150 mg/ml).

Thus, in a further aspect, the present disclosure relates to TPP-23298, that binds to human Sema3A, wherein said isolated antibody or antigen-binding fragment thereof i) exhibits an increased viscosity compared to water or PBS; ii) exhibits a reduced viscosity in PBS compared to TPP-30788 (BI clone I); iii) wherein the viscosity is measured by a Viscosizer and exhibits a cP value of 5.1 (150 mg/ml).

In particular the isolated antibody or antigen-binding fragment according to the present disclosure shows a much higher solubility and stability, is more resistant to heat stress and is less viscous in PBS buffer than TPP-30788 as described in Example 17.

In particular TPP-23298 shows a much higher solubility and stability, is more resistant to heat stress and is less viscous in PBS buffer than TPP-30788 as described in Example 17.

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, which can be produced with high titers in mammalian cells; i) wherein high titer is ≤200 mg/L as described in Example 16.

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, wherein the antibody exhibits a higher binding selectivity to active Sema3A (TPP-13211) over cleaved Sema3A TPP-19068; i) wherein the antibody exhibits a higher binding selectivity to active Sema3A (TPP-13211) compared to the binding selectivity of TPP-30788-TPP-30791 to active Sema3A, as described in Example 8.

In another aspect the present disclosure relates to TPP-23298 binding to human Sema3A, wherein the antibody exhibits a higher binding selectivity to active Sema3A (TPP-13211) over cleaved Sema3A TPP-19068; i) wherein the antibody exhibits a higher binding selectivity to active Sema3A (TPP-13211) compared to the binding selectivity of TPP-30788-TPP-30791 to active Sema3A, as described in Example 8.

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof binding to human Sema3A, wherein the antibody binds a different epitope on Sema3A compared to TPP-30788; i) wherein the epitope binding is measured in SPR assay, as described in Example 5a. All antibodies binding the same epitope and competing with the binding of the isolated antibody or antigen-binding fragment according to the present disclosure are comprised by the present disclosure.

In another aspect the present disclosure relates to TPP-23298 binding to human Sema3A, wherein the antibody binds a different epitope on Sema3A compared to TPP-30788; i) wherein the epitope binding is measured in SPR assay, as described in Example 5a. All antibodies binding the same epitope and competing with the binding of the isolated antibody or antigen-binding fragment according to the present disclosure are comprised by the present disclosure.

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In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof that competes with the isolated antibody or antigen-binding fragment according to any one of the preceding claims for binding to Sema3A and wherein the isolated antibody or antigen-binding fragment does not compete with the binding of an antibody with the SEQ IDs NO 800, NO 804, NO 810 or NO 811 to Sema3A.

The isolated antibody or antigen-binding fragment according to the present disclosure may exhibit any combination of the above described characteristics.

The isolated antibody or antigen-binding fragment according to the present disclosure is a Sema3A blocking antibody or antigen-binding fragment thereof. In particular embodiments, the antibody binds specifically and more particularly selectively to the Sema3A domain of Semaphorin3A and interferes with the interaction of its receptor neuropilin-1.

In particular embodiments, the isolated antibody or antigen-binding fragment thereof according to the present disclosure cross-reacts with mouse, cynomolgus, rat, pig and/or dog Sema3A, particularly having an affinity to mouse, cynomolgus, rat, pig and/or dog Sema3A that is less than 100-fold, particularly less than 50-fold, more particularly less than 25-fold, even more particularly less than 10-fold and most particularly less than 5-fold different to that to human Sema3A.

In particular embodiments, the isolated antibody or antigen-binding fragment thereof according to the present disclosure does not significantly cross-react with human Sema3B, Sema3C, Sema3D, Sema3E, Sema3F and/or Sema3G. In particular, the isolated antibody or antigen-binding fragment thereof does not significantly cross-react with human Sema3G.

In particular embodiments, the isolated antibody or antigen-binding fragment thereof according to the present disclosure inhibits Sema3A-induced albuminuria and/or proteinuria.

In particular embodiments, the isolated antibody or antigen-binding fragment thereof according to the present disclosure inhibits Sema3A-induced fibrosis.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain variable domain that is at least 90%, at least 95%, at least 98%, at least 99%, or 100% identical to SEQ ID NO: 141, and a light chain variable domain that is at least 90%, at least 95%, at least 98%, at least 99%, or 100% identical to SEQ ID NO: 145.

In particular other embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain variable domain that is at least 90%, at least 95%, at least 98%, at least 99%, or 100% identical to SEQ ID NO: 61, and a light chain variable domain that is at least 90%, at least 95%, at least 98%, at least 99%, or 100% identical to SEQ ID NO: 65.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR3 comprising the sequence RDDYTSRDAFDX (SEQ ID NO: 594), wherein X is selected from the group consisting of Y and V. Particularly, X is Y.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR3 comprising the sequence X₁AWDDSLNX₂X₃X₄V (SEQ ID NO: 598), wherein X₁ is

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selected from the group consisting of A and H, wherein X₂ is selected from the group consisting of V, D, and G, in particular wherein X₂ is selected from the group consisting of V and D, wherein X₃ is selected from the group consisting of I and Y, and wherein X₄ is selected from the group consisting of P and V.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR3 as defined above and a light chain antigen-binding region that comprises an L-CDR3 as defined above.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR3 comprising the sequence SGYSSS-WFDPDFDY (SEQ ID NO: 64).

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR3 comprising the sequence X₁SYX₂GX₃NPYVV (SEQ ID NO: 599), wherein X₁ is selected from the group consisting of S and Q; wherein X₂ is selected from the group consisting of E and A; and wherein X₃ is selected from the group consisting of P, I, and S. In particular, X₃ is selected from the group consisting of P and I.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR3 as defined above and a light chain antigen-binding region that comprises an L-CDR3 as defined above.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR1 comprising the sequence SYX₁MX₂ (SEQ ID NO: 588), wherein X₁ is selected from G and A and wherein X₂ is selected from H, S and L. Particularly, the heavy chain antigen-binding region comprises an H-CDR1 comprising the sequence SYAMX (SEQ ID NO: 589), wherein X is selected from S and L.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR2 comprising the sequence AIGX₁GGDTYYADSVX₂G (SEQ ID NO: 590), wherein X₁ is selected from T and Y, and wherein X₂ is selected from K and M. Particularly, the heavy chain antigen-binding region comprises an H-CDR2 comprising the sequence AIGXGGDTYYADSVKG (SEQ ID NO: 591), wherein X is selected from T and Y.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR3 comprising the sequence RDDYTSRDAFDX (SEQ ID NO: 594), wherein X is selected from the group consisting of Y and V. Particularly, X is Y.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR1, an H-CDR2 and an H-CDR3 as defined above.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure

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comprises a light chain antigen-binding region that comprises an L-CDR1 comprising the sequence SGSSSNIG-SNTVN (SEQ ID NO: 46).

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR2 comprising the sequence YDDLXPS (SEQ ID NO: 596), wherein X is selected from L and R. Particularly, the light chain antigen-binding region comprises an L-CDR2 comprising the sequence YDDLRLPS (SEQ ID NO: 127).

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR3 comprising the sequence X₁AWDDSLNX₂X₃X₄V (SEQ ID NO: 598), wherein X₁ is selected from the group consisting of A and H, wherein X₂ is selected from the group consisting of V, D, and G, in particular wherein X₂ is selected from the group consisting of V and D, wherein X₃ is selected from the group consisting of I and Y, and wherein X₄ is selected from the group consisting of P and V.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR1, and L-CDR2 and an L-CDR3 as defined above.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR1, an H-CDR2 and an H-CDR3 as defined above and a light chain antigen-binding region that comprises an L-CDR1, and L-CDR2 and an L-CDR3 as defined above.

In particular such embodiments, the amino acid residue directly adjacent to the H-CDR1 at its 5' end (corresponding to residue 30 of reference VII domain of SEQ ID NO: 121) is S or Y.

In particular other embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR1 comprising the sequence SYEMN (SEQ ID NO: 62).

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR2 comprising the sequence GISWNSGX₁IX₂YADSVKG (SEQ ID NO: 592), wherein X₁ is selected from W and S and X₂ is selected from G and D. Particularly, the heavy chain antigen-binding region comprises an H-CDR2 comprising the sequence GISWNSGWIXYADSVKG (SEQ ID NO: 593), wherein X is selected from G and D.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR3 comprising the sequence SGYSSS-WFDPDFDY (SEQ ID NO: 64).

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR1, an H-CDR2 and an H-CDR3 as defined above.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that com-

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prises an L-CDR1 comprising the sequence TGSSSX₁-GAGYDVH (SEQ ID NO: 595), wherein X is selected from N and D.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR2 comprising the sequence GXSNRPS (SEQ ID NO: 597), wherein X is selected from N and A. 5

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR3 comprising the sequence X₁SYX₂GX₃NPYVV (SEQ ID NO: 599), wherein X₁ is selected from the group consisting of S and Q, wherein X₂ is selected from the group consisting of E and A, and wherein X₃ is selected from the group consisting of P, I, and S. Particularly, X₃ is selected from the group consisting of P and I. 10

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR1, and L-CDR2 and an L-CDR3 as defined above. 20

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR1, an H-CDR2 and an H-CDR3 as defined above and a light chain antigen-binding region that comprises an L-CDR1, and L-CDR2 and an L-CDR3 as defined above. 25

In particular such embodiments, the three amino acid residues directly adjacent to the H-CDR1 at its 5' end (corresponding to residues 28 to 30 of reference VH domain of SEQ ID NO: 101) are X₁FX₂, wherein X₁ is selected from T and D and X₂ is selected from S and D. 30

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises:

- i) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 44 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 48; or 40
- ii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 64 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 68; or 45
- iii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 104 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 108; or 50
- iv) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 124 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 128; or 55
- v) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 144 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 148; or 60
- vi) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 164 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 168; or 65
- vii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 184 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 188; or 65

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- viii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 204 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 208; or
- ix) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 224 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 228; or
- x) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 244 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 248; or
- xi) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 264 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 268; or
- xii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 284 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 288; or
- xiii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 304 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 308; or
- xiv) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 324 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 328; or
- xv) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 344 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 348; or
- xvi) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 364 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 368; or
- xvii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 384 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 388; or
- xviii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 404 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 408; or
- xix) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 424 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 428; or
- xx) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 444 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 448; or
- xxi) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 464 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 468; or
- xxii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 484 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 488; or
- xxiii) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 504 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 508; or
- xxiv) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 524 and a light

chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 528; or
xxv) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 544 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 548; or
xxvi) a heavy chain antigen-binding region that comprises an H-CDR3 comprising SEQ ID NO: 564 and a light chain antigen-binding region that comprises an L-CDR3 comprising SEQ ID NO: 568.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR1 comprising any one of SEQ ID NOS: 42, 62, 102, 122, 142, 162, 182, 202, 222, 242, 262, 282, 302, 322, 342, 362, 382, 402, 422, 442, 462, 482, 502, 522, 542, and 562.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a heavy chain antigen-binding region that comprises an H-CDR2 comprising any one of SEQ ID NOs: 43, 63, 103, 123, 143, 163, 183, 203, 223, 243, 263, 283, 303, 323, 343, 363, 383, 403, 423, 443, 463, 483, 503, 523, 543, and 563.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR1 comprising any one of SEQ ID NOs: 46, 66, 106, 126, 146, 166, 186, 206, 226, 246, 266, 286, 306, 326, 346, 366, 386, 406, 426, 446, 466, 486, 506, 526, 546, 30 and 566.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises a light chain antigen-binding region that comprises an L-CDR2 comprising any one of SEQ ID NOs: 47, 35
67, 107, 127, 147, 167, 187, 207, 227, 247, 267, 287, 307, 327, 347, 367, 387, 407, 427, 447, 467, 487, 507, 527, 547, and 567.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure 40 comprises:

- i) a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 42, an H-CDR2 comprising SEQ ID NO: 43, and an H-CDR3 comprising SEQ ID NO: 44 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 46, an L-CDR2 comprising SEQ ID NO: 47, and an L-CDR3 comprising SEQ ID NO: 48; or
 - ii) a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 62, an H-CDR2 comprising SEQ ID NO: 63, and an H-CDR3 comprising SEQ ID NO: 64 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 66, an L-CDR2 comprising SEQ ID NO: 67, and an L-CDR3 comprising SEQ ID NO: 68; or
 - iii) a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 102, an H-CDR2 comprising SEQ ID NO: 103, and an H-CDR3 comprising SEQ ID NO: 104 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 106, an L-CDR2 comprising SEQ ID NO: 107, and an L-CDR3 comprising SEQ ID NO: 108; or
 - iv) a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 122, an H-CDR2 comprising SEQ ID NO: 123, and an H-CDR3 comprising SEQ ID NO: 124 and a light chain antigen-binding region that comprises an L-CDR1 comprising

SEQ ID NO: 506, an L-CDR2 comprising SEQ ID NO: 507, and an L-CDR3 comprising SEQ ID NO: 508; or
xxiv) a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 522, an H-CDR2 comprising SEQ ID NO: 523, and an H-CDR3 comprising SEQ ID NO: 524 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 526, an L-CDR2 comprising SEQ ID NO: 527, and an L-CDR3 comprising SEQ ID NO: 528; or
xxv) a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 542, an H-CDR2 comprising SEQ ID NO: 543, and an H-CDR3 comprising SEQ ID NO: 544 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 546, an L-CDR2 comprising SEQ ID NO: 547, and an L-CDR3 comprising SEQ ID NO: 548; or
xxvi) a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 562, an H-CDR2 comprising SEQ ID NO: 563, and an H-CDR3 comprising SEQ ID NO: 564 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 566, an L-CDR2 comprising SEQ ID NO: 567, and an L-CDR3 comprising SEQ ID NO: 568.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure comprises:

- i) a variable heavy chain domain comprising SEQ ID NO: 41 and a variable light chain domain comprising SEQ ID NO: 45; or
 - ii) a variable heavy chain domain comprising SEQ ID NO: 61 and a variable light chain domain comprising SEQ ID NO: 65; or
 - iii) a variable heavy chain domain comprising SEQ ID NO: 101 and a variable light chain domain comprising SEQ ID NO: 105; or
 - iv) a variable heavy chain domain comprising SEQ ID NO: 121 and a variable light chain domain comprising SEQ ID NO: 125; or
 - v) a variable heavy chain domain comprising SEQ ID NO: 141 and a variable light chain domain comprising SEQ ID NO: 145; or
 - vi) a variable heavy chain domain comprising SEQ ID NO: 161 and a variable light chain domain comprising SEQ ID NO: 165; or
 - vii) a variable heavy chain domain comprising SEQ ID NO: 181 and a variable light chain domain comprising SEQ ID NO: 185; or
 - viii) a variable heavy chain domain comprising SEQ ID NO: 201 and a variable light chain domain comprising SEQ ID NO: 205; or
 - ix) a variable heavy chain domain comprising SEQ ID NO: 221 and a variable light chain domain comprising SEQ ID NO: 225; or
 - x) a variable heavy chain domain comprising SEQ ID NO: 241 and a variable light chain domain comprising SEQ ID NO: 245; or
 - xi) a variable heavy chain domain comprising SEQ ID NO: 261 and a variable light chain domain comprising SEQ ID NO: 265; or
 - xii) a variable heavy chain domain comprising SEQ ID NO: 281 and a variable light chain domain comprising SEQ ID NO: 285; or
 - xiii) a variable heavy chain domain comprising SEQ ID NO: 301 and a variable light chain domain comprising SEQ ID NO: 305; or

- xiv) a variable heavy chain domain comprising SEQ ID NO: 321 and a variable light chain domain comprising SEQ ID NO: 325; or
- xv) a variable heavy chain domain comprising SEQ ID NO: 341 and a variable light chain domain comprising SEQ ID NO: 345; or
- xvi) a variable heavy chain domain comprising SEQ ID NO: 361 and a variable light chain domain comprising SEQ ID NO: 365; or
- xvii) a variable heavy chain domain comprising SEQ ID NO: 381 and a variable light chain domain comprising SEQ ID NO: 385; or
- xviii) a variable heavy chain domain comprising SEQ ID NO: 401 and a variable light chain domain comprising SEQ ID NO: 405; or
- xix) a variable heavy chain domain comprising SEQ ID NO: 421 and a variable light chain domain comprising SEQ ID NO: 425; or
- xx) a variable heavy chain domain comprising SEQ ID NO: 441 and a variable light chain domain comprising SEQ ID NO: 445; or
- xxi) a variable heavy chain domain comprising SEQ ID NO: 461 and a variable light chain domain comprising SEQ ID NO: 465; or
- xxii) a variable heavy chain domain comprising SEQ ID NO: 481 and a variable light chain domain comprising SEQ ID NO: 485; or
- xxiii) a variable heavy chain domain comprising SEQ ID NO: 501 and a variable light chain domain comprising SEQ ID NO: 505; or
- xxiv) a variable heavy chain domain comprising SEQ ID NO: 521 and a variable light chain domain comprising SEQ ID NO: 525; or
- xxv) a variable heavy chain domain comprising SEQ ID NO: 541 and a variable light chain domain comprising SEQ ID NO: 545; or
- xxvi) a variable heavy chain domain comprising SEQ ID NO: 561 and a variable light chain domain comprising SEQ ID NO: 565.

In particular embodiments, the isolated antibody according to the present disclosure is an IgG antibody. In particular such embodiments, the isolated antibody according to the present disclosure is an IgG1, IgG2, IgG3 or an IgG4 antibody. Most particularly, the isolated antibody according to the present disclosure is an IgG1 or an IgG4 antibody.

In particular embodiments, the isolated antibody according to the present disclosure comprises:

- i) a heavy chain comprising SEQ ID NO: 57 and a light chain comprising SEQ ID NO: 58; or
- ii) a heavy chain comprising SEQ ID NO: 77 and a light chain comprising SEQ ID NO: 78; or
- iii) a heavy chain comprising SEQ ID NO: 117 and a light chain comprising SEQ ID NO: 118; or
- iv) a heavy chain comprising SEQ ID NO: 137 and a light chain comprising SEQ ID NO: 138; or
- v) a heavy chain comprising SEQ ID NO: 157 and a light chain comprising SEQ ID NO: 158; or
- vi) a heavy chain comprising SEQ ID NO: 177 and a light chain comprising SEQ ID NO: 178; or
- vii) a heavy chain comprising SEQ ID NO: 197 and a light chain comprising SEQ ID NO: 198; or
- viii) a heavy chain comprising SEQ ID NO: 217 and a light chain comprising SEQ ID NO: 218; or
- ix) a heavy chain comprising SEQ ID NO: 237 and a light chain comprising SEQ ID NO: 238; or
- x) a heavy chain comprising SEQ ID NO: 257 and a light chain comprising SEQ ID NO: 258; or

- xi) a heavy chain comprising SEQ ID NO: 277 and a light chain comprising SEQ ID NO: 278; or
- xii) a heavy chain comprising SEQ ID NO: 297 and a light chain comprising SEQ ID NO: 298; or
- xiii) a heavy chain comprising SEQ ID NO: 317 and a light chain comprising SEQ ID NO: 318; or
- xiv) a heavy chain comprising SEQ ID NO: 337 and a light chain comprising SEQ ID NO: 338; or
- xv) a heavy chain comprising SEQ ID NO: 357 and a light chain comprising SEQ ID NO: 358; or
- xvi) a heavy chain comprising SEQ ID NO: 377 and a light chain comprising SEQ ID NO: 378; or
- xvii) a heavy chain comprising SEQ ID NO: 397 and a light chain comprising SEQ ID NO: 398; or
- xviii) a heavy chain comprising SEQ ID NO: 417 and a light chain comprising SEQ ID NO: 418; or
- xix) a heavy chain comprising SEQ ID NO: 437 and a light chain comprising SEQ ID NO: 438; or
- xx) a heavy chain comprising SEQ ID NO: 457 and a light chain comprising SEQ ID NO: 458; or
- xi) a heavy chain comprising SEQ ID NO: 477 and a light chain comprising SEQ ID NO: 478; or
- xxii) a heavy chain comprising SEQ ID NO: 497 and a light chain comprising SEQ ID NO: 498; or
- xxiii) a heavy chain comprising SEQ ID NO: 517 and a light chain comprising SEQ ID NO: 518; or
- xxiv) a heavy chain comprising SEQ ID NO: 537 and a light chain comprising SEQ ID NO: 538; or
- xxv) a heavy chain comprising SEQ ID NO: 557 and a light chain comprising SEQ ID NO: 558; or
- xxvi) a heavy chain comprising SEQ ID NO: 577 and a light chain comprising SEQ ID NO: 578.

In particular embodiments, the antigen-binding fragment according to the present disclosure is an scFv, Fab, Fab' fragment or a F(ab')² fragment.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is a monoclonal antibody or antigen-binding fragment thereof.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is a human, humanized or chimeric antibody or antigen-binding fragment thereof, more particularly a fully human antibody or antigen-binding fragment thereof.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is a monospecific antibody. In particular other embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is a multispecific antibody that binds to Sema3A and at least one further antigen, such as a bispecific, trispecific or tetraspecific antibody.

In another aspect the present disclosure relates to an isolated antibody or antigen-binding fragment thereof that competes with the isolated antibody or antigen-binding fragment according to the present disclosure for binding to human Sema3A.

In a further aspect, the present disclosure relates to an antibody conjugate, comprising the isolated antibody or antigen binding fragment according to the present disclosure. For example, an antibody could be conjugated to a cytotoxic agent, an immunotoxin, a toxophore or a radioisotope. Also provided are anti-Sema3A antibodies conjugated to a detectable marker. Preferred markers are a radiolabel, an enzyme, a chromophore or a fluorophore. The antibody may also be conjugated to high molecular weight molecules such as peptides or proteins, such as interleukins.

The ADC according to the present disclosure comprises an anti-Sema3A antibody conjugated to one or more cyto-

toxic agents, such as chemotherapeutic agents or drugs, growth inhibitory agents, toxins (e.g., protein toxins, enzymatically active toxins of bacterial, fungal, plant, human or animal origin, or fragments thereof), or radioactive isotopes.

In one embodiment, the ADC according to the present disclosure comprises an anti-Sema3A antibody as described herein conjugated to one or more drugs, including but not limited to a maytansinoid (see U.S. Pat. Nos. 5,208,020, 5,416,064 and European Patent EP0425235); an auristatin such as monomethylauristatin drug moieties DE and DF (MMAE and MMAF) (see U.S. Pat. Nos. 5,635,483 and 5,780,588, and 7,498,298); a dolastatin; a calicheamicin or derivative thereof; an anthracycline such as daunomycin or doxorubicin; methotrexate; vindesine; a taxane such as docetaxel, paclitaxel, lurtaxel, tesetaxel, and ortataxel; a trichothecene; and CC1065.

In another embodiment, the ADC according to the present disclosure comprises an anti-Sema3A antibody as described herein conjugated to an enzymatically active toxin or fragment thereof, including but not limited to diphtheria A chain, nonbinding active fragments of diphtheria toxin, exotoxin A chain (from *Pseudomonas aeruginosa*), ricin A chain, abrin A chain, modeccin A chain, alphasarcin, *Aleurites fordii* proteins, dianthin proteins, *Phytolaca americana* proteins (P API, P APII, and PAP-S), *Momordica charantia* inhibitor, curcin, crotin, *Sapaponaria officinalis* inhibitor, gelonin, mitogellin, restrictocin, phenomycin, enomycin, and the trichothecenes.

In another embodiment, the ACD according to the present disclosure comprises an anti-Sema3A antibody as described herein conjugated to a radioactive atom to form a radioconjugate. A variety of radioactive isotopes are available for the production of radioconjugates. Examples include 227Th, 225Ac, 211At, 131I, 125I, 90Y, 186Re, 188Re, 153Sm, 212Bi, 32P, 212Pb and radioactive isotopes of Lu. When the radioconjugate is used for detection, it may comprise a radioactive atom for scintigraphic studies, for example Tc99m, or a spin label for nuclear magnetic resonance (NMR) imaging, such as iodine-123 again, iodine-131, indium-111, fluorine-19, carbon-13, nitrogen-15, oxygen-17, gadolinium, manganese or iron.

Conjugates of an antibody and cytotoxic agent may be made using a variety of bifunctional protein coupling agents such as N-succinimidyl-3-(2-pyridylidithio) propionate (SPDP), succinimidyl-4-(N-maleimidomethyl) cyclohexane-1-carboxylate (SMCC), iminothiolane (IT), bifunctional derivatives of imidoesters (such as dimethyl adipimide HCl), active esters (such as disuccinimidyl suberate), aldehydes (such as glutaraldehyde), 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).

The linker may be a "cleavable linker" facilitating release of a cytotoxic drug in the cell. For example, an acid-labile linker, peptidase-sensitive linker, photolabile linker, dimethyl linker or disulfide-containing linker (Chari et al., Cancer Res. 52:12 7-131 (1992).

The ACD according to the present disclosure includes ADCs prepared with cross-linker reagents including, but not limited to, BMPS, EMCS, GMBS, HBVS, LC-SMCC, MBS, MPBH, SBAP, SIA, SIAB, SMCC, SMPB, SMPH, sulfo-EMCS, sulfo-GMBS, sulfo-KMUS, sulfo-MBS, sulfo-SIAB, sulfo-SMCC, and sulfo-SMPB, and SVSB

(succinimidyl-(4-vinylsulfone)benzoate) which are commercially available (e.g., from Pierce Biotechnology, Inc., Rockford, IL., U.S.A.)

5 Amino acid and nucleic acid sequences of preferred antibodies according to the present disclosure and three prior art antibodies are listed in Table 1 and Table 1A.

Peptide Variants

10 Antibodies or antigen-binding fragments of the disclosure are not limited to the specific peptide sequences provided herein. Rather, the disclosure also embodies variants of these polypeptides. With reference to the instant disclosure and conventionally available technologies and references, the skilled worker will be able to prepare, test and utilize functional variants of the antibodies disclosed herein, while appreciating these variants having the ability to bind to Sema3A fall within the scope of the present disclosure.

15 A variant can include, for example, an antibody that has at least one altered complementary determining region (CDR) (hyper-variable) and/or framework (FR) (variable) domain/position, vis-à-vis a peptide sequence disclosed herein.

20 By altering one or more amino acid residues in a CDR or FR region, the skilled worker routinely can generate mutated or diversified antibody sequences, which can be screened against the antigen, for new or improved properties, for example.

25 A further preferred embodiment of the disclosure is an antibody or antigen-binding fragment thereof in which the VH and VL sequences are selected as shown in Table 1 and Table 1A. The skilled worker can use the data in Table 1 and Table 1A to design peptide variants that are within the scope of the present disclosure. It is preferred that variants are constructed by changing amino acids within one or more CDR regions; a variant might also have one or more altered framework regions. For example, a peptide FR domain might be altered where there is a deviation in a residue compared to a germline sequence.

30 Alternatively, the skilled worker could make the same analysis by comparing the amino acid sequences disclosed herein to known sequences of the same class of such antibodies, using, for example, the procedure described by Knappik A., et al., JMB 2000, 296:57-86.

35 Furthermore, variants may be obtained by using one antibody as starting point for further optimization by diversifying one or more amino acid residues in the antibody, preferably amino acid residues in one or more CDRs, and by screening the resulting collection of antibody variants for variants with improved properties. Particularly preferred is diversification of one or more amino acid residues in CDR3 of VL and/or VH. Diversification can be done e.g. by synthesizing a collection of DNA molecules using trinucleotide mutagenesis (TRIM) technology (Virnekäs B. et al., Nucl. Acids Res. 1994, 22:5600.). Antibodies or antigen-binding fragments thereof include molecules with modifications/variations including but not limited to e.g. modifications leading to altered half-life (e.g. modification of the Fc part or attachment of further molecules such as PEG), altered binding affinity or altered ADCC or CDC activity. Conservative Amino Acid Variants

40 Polypeptide variants may be made that conserve the overall molecular structure of an antibody peptide sequence described herein. Given the properties of the individual amino acids, some rational substitutions will be recognized by the skilled worker. Amino acid substitutions, i.e., "conservative substitutions," may be made, for instance, on the

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basis of similarity in polarity, charge, solubility, hydrophobicity, hydrophilicity, and/or the amphipathic nature of the residues involved.

For example, (a) nonpolar (hydrophobic) amino acids include alanine, leucine, isoleucine, valine, proline, phenylalanine, tryptophane, and methionine; (b) polar neutral amino acids include glycine, serine, threonine, cysteine, tyrosine, asparagine, and glutamine; (c) positively charged (basic) amino acids include arginine, lysine, and histidine; and (d) negatively charged (acidic) amino acids include aspartic acid and glutamic acid. Substitutions typically may be made within groups (a)-(d). In addition, glycine and proline may be substituted for one another based on their ability to disrupt α -helices. Similarly, certain amino acids, such as alanine, cysteine, leucine, methionine, glutamic acid, glutamine, histidine and lysine are more commonly found in α -helices, while valine, isoleucine, phenylalanine, tyrosine, tryptophan and threonine are more commonly found in β -pleated sheets. Glycine, serine, aspartic acid, asparagine, and proline are commonly found in turns. Some preferred substitutions may be made among the following groups: (i) S and T; (ii) P and G; and (iii) A, V, L and I. Given the known genetic code, and recombinant and synthetic DNA techniques, the skilled scientist readily can construct DNAs encoding the conservative amino acid variants.

Glycosylation Variants

Where the antibody comprises an Fc region, the carbohydrate attached thereto may be altered. Native antibodies produced by mammalian cells typically comprise a branched, biantennary oligosaccharide that is generally attached by an N-linkage to Asn297 using Kabat EU numbering of the CH2 domain of the Fc region; see, e.g., Wright et al. Trends Biotechnol. 15:26-32 (1997).

In certain embodiments, an antibody provided herein is altered to increase or decrease the extent to which the antibody is glycosylated. Addition or deletion of glycosylation sites to an antibody may be conveniently accomplished by altering the expression system (e.g. host cell) and/or by altering the amino acid sequence such that one or more glycosylation sites is created or removed.

In one embodiment of this disclosure, aglycosyl antibodies having decreased effector function or antibody derivatives are prepared by expression in a prokaryotic host. Suitable prokaryotic hosts for include but are not limited to *E. coli*, *Bacillus subtilis*, *Salmonella typhimurium* and various species within the genera *Pseudomonas*, *Streptomyces*, and *Staphylococcus*.

In one embodiment, antibody variants are provided having decreased effector function, which are characterized by a modification at the conserved N-linked site in the CH2 domains of the Fc portion of said antibody. In one embodiment of present disclosure, the modification comprises a mutation at the heavy chain glycosylation site to prevent glycosylation at the site. Thus, in one preferred embodiment of this disclosure, the aglycosyl antibodies or antibody derivatives are prepared by mutation of the heavy chain glycosylation site, —i.e., mutation of N297 using Kabat EU numbering and expressed in an appropriate host cell.

In another embodiment of the present disclosure, aglycosyl antibodies or antibody derivatives have decreased effector function, wherein the modification at the conserved N-linked site in the CH2 domains of the Fc portion of said antibody or antibody derivative comprises the removal of the CH2 domain glycans, —i.e., deglycosylation. These aglycosyl antibodies may be generated by conventional methods and then deglycosylated enzymatically. Methods

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for enzymatic deglycosylation of antibodies are well known in the art (e.g. Winkelhake & Nicolson (1976), J Biol Chem. 251 (4): 1074-80).

In another embodiment of this disclosure, deglycosylation may be achieved using the glycosylation inhibitor tunicamycin (Nose & Wigzell (1983), Proc Natl Acad Sci USA, 80 (21): 6632-6). That is, the modification is the prevention of glycosylation at the conserved N-linked site in the CH2 domains of the Fc portion of said antibody.

10 In one embodiment, antibody variants are provided having a carbohydrate structure that lacks fucose attached (directly or indirectly) to an Fc region. For example, the amount of fucose in such antibody may be from 1% to 80%, from 1% to 65%, from 5% to 65% or from 20% to 40%. The 15 amount of fucose is determined by calculating the average amount of fucose within the sugar chain at Asn297, relative to the sum of all glycostructures attached to Asn 297 (e.g. complex, hybrid and high mannose structures) as measured by MALDI-TOF mass spectrometry, as described in WO 2008/077546, for example. Asn297 refers to the asparagine residue located at about position 297 in the Fc region (Eu numbering of Fc region residues); however, Asn297 may also be located about ± 3 amino acids upstream or downstream of position 297, i.e., between positions 294 and 300, 20 due to minor sequence variations in antibodies. Such fucosylation variants may have improved ADCC function.

Examples of publications related to “defucosylated” or “fucose-deficient” antibody variants include: Okazaki et al. J Mol. Biol. 336:1239-1249 (2004); Yamane-Ohnuki et al. Biotech. Bioeng. 87:614 (2004).

30 Examples of cell lines capable of producing defucosylated antibodies include Lec13 CHO cells deficient in protein fucosylation (Ripka et al. Arch. Biochem. Biophys. 249: 533-545 (1986); and WO 2004/056312), and knockout cell 35 lines, such as alpha-1,6-fucosyltransferase gene, FUT8, knockout CHO cells (see, e.g., Yamane-Ohnuki et al. Biotech. Bioeng. 87:614 (2004); Kanda, Y. et al., Biotechnol. Bioeng., 94 (4): 680-688 (2006)).

Antibody variants are further provided with bisected 40 oligosaccharides, e.g., in which a biantennary oligosaccharide attached to the Fc region of the antibody is bisected by GlcNAc. Such antibody variants may have reduced fucosylation and/or improved ADCC function. Examples of such antibody variants are described, e.g., in WO 2003/011878; 45 U.S. Pat. No. 6,602,684; and US 2005/0123546.

Antibody variants with at least one galactose residue in 50 the oligosaccharide attached to the Fc region are also provided. Such antibody variants may have improved CDC function. Such antibody variants are described, e.g., in WO1997/30087; WO1998/58964; and WO1999/22764.

FC Region Variants

In certain embodiments, one or more amino acid modifications (e.g. a substitution) may be introduced into the Fc region of an antibody (e.g., a human IgG1, IgG2, IgG3 or 55 IgG4 Fc region) provided herein, thereby generating an Fc region variant.

In certain embodiments, the disclosure contemplates an antibody variant that possesses some but not all effector functions, which make it a desirable candidate for applications in which the half-life of the antibody in vivo is important yet certain effector functions (such as complement and ADCC) are unnecessary or deleterious. In vitro and/or in vivo cytotoxicity assays can be conducted to confirm the reduction/depletion of CDC and/or ADCC activities. For 60 example, Fc receptor (FcR) binding assays can be conducted to ensure that the antibody lacks Fc γ R binding (hence likely lacking ADCC activity) but retains FcRn binding ability. In

some embodiments, alterations are made in the Fc region that result in altered (i.e., either improved or diminished) C1q binding and/or Complement Dependent Cytotoxicity (CDC).

In certain embodiments, the disclosure contemplates an antibody variant that possesses an increased or decreased half-life. Antibodies with increased half-lives and improved binding to the neonatal Fc receptor (FcRn), which is responsible for the transfer of maternal IgGs to the fetus (Guyer et al., J Immunol. 117:587 (1976) and Kim et al., J Immunol. 24:249 (1994)), are described in US2005/0014934 (Hinton et al.). Those antibodies comprise an Fc region with one or more substitutions therein which improve binding of the Fc region to FcRn.

Antibody Generation

An antibody of the disclosure may be derived from a recombinant antibody library that is based on amino acid sequences that have been isolated from the antibodies of a large number of healthy volunteers e.g. using the n-CoDeR® technology the fully human CDRs are recombined into new antibody molecules (Carlson & Söderlind, Expert Rev Mol Diagn. 2001 May; 1 (1): 102-8). Or alternatively for example antibody libraries as the fully human antibody phage display library described in Hoet R M et al., Nat Biotechnol 2005; 23 (3): 344-8) can be used to isolate Sema3A-specific antibodies. Antibodies or antibody fragments isolated from human antibody libraries are considered human antibodies or human antibody fragments herein.

Human antibodies may be further prepared by administering an immunogen to a transgenic animal that has been modified to produce intact human antibodies or intact antibodies with human variable regions in response to antigenic challenge. Such animals typically contain all or a portion of the human immunoglobulin loci, which replace the endogenous immunoglobulin loci, or which are present extrachromosomally or integrated randomly into the animal's chromosomes. For example immunization of genetically engineered mice inter alia immunization of hMAb mice (e.g. VelocImmune Mouse® or XENOMOUSE®) may be performed.

Further antibodies may be generated using the hybridoma technology (for example see Köhler and Milstein Nature. 1975 Aug. 7; 256 (5517): 495-7), resulting in for example murine, rat, or rabbit antibodies which can be converted into chimeric or humanized antibodies. Humanized antibodies and methods of making them are reviewed, e.g., in Almagro and Fransson, Front. Biosci. 13:1619-1633 (2008), and are further described, e.g., in Riechmann et al., Nature 332:323-329 (1988); Queen et al., Proc. Natl Acad. Sci. USA 86:10029-10033 (1989); U.S. Pat. Nos. 5,821,337, 7,527, 791, 6,982,321, and 7,087,409; Kashmiri et al., Methods 36:25-34 (2005) (describing specificity determining region (SDR) grafting); Padlan, Mol. Immunol. 28:489-498 (1991) (describing "resurfacing"); Dall'Acqua et al., Methods 36:43-60 (2005) (describing "FR shuffling"); and Osboum et al., Methods 36:61-68 (2005) and Klimka et al., Br. J. Cancer, 83:252-260 (2000) (describing the "guided selection" approach to FR shuffling).

Examples are provided for the generation of antibodies using a recombinant antibody library.

DNA Molecules According to the Present Disclosure

The present disclosure also relates to an isolated nucleic acid sequence that encodes the antibody or antigen-binding fragment according to the present disclosure. The isolated nucleic acid sequence encoding the antibody or antigen-binding fragment according to the present disclosure can for instance be produced by techniques described in Sambrook

et al., 1989, and Ausubel et al., 1989, or alternatively, by chemically synthesis. (e.g. techniques described in Oligonucleotide Synthesis (1984, Gait, ed., IRL Press, Oxford)). The DNA sequences and respective SEQ IDs used for the antibodies expressed are given in Table 1 and 1A. These sequences are optimized in certain cases for mammalian expression. DNA molecules of the disclosure are not limited to the sequences disclosed herein, but also include variants thereof. DNA variants within the disclosure may be described by reference to their physical properties in hybridization. The skilled worker will recognize that DNA can be used to identify its complement and, since DNA is double stranded, its equivalent or homolog, using nucleic acid hybridization techniques. It also will be recognized that hybridization can occur with less than 100% complementarity. However, given appropriate choice of conditions, hybridization techniques can be used to differentiate among DNA sequences based on their structural relatedness to a particular probe. For guidance regarding such conditions see, Sambrook et al., 1989 *supra* and Ausubel et al., 1995 (Ausubel, F. M., Brent, R., Kingston, R. E., Moore, D. D., Sedman, J. G., Smith, J. A., & Struhl, K. eds. (1995). Current Protocols in Molecular Biology. New York: John Wiley and Sons).

Structural similarity between two polynucleotide sequences can be expressed as a function of "stringency" of the conditions under which the two sequences will hybridize with one another. As used herein, the term "stringency" refers to the extent that the conditions disfavor hybridization. Stringent conditions strongly disfavor hybridization, and only the most structurally related molecules will hybridize to one another under such conditions. Conversely, non-stringent conditions favor hybridization of molecules displaying a lesser degree of structural relatedness. Hybridization stringency, therefore, directly correlates with the structural relationships of two nucleic acid sequences.

Hybridization stringency is a function of many factors, including overall DNA concentration, ionic strength, temperature, probe size and the presence of agents which disrupt hydrogen bonding. Factors promoting hybridization include high DNA concentrations, high ionic strengths, low temperatures, longer probe size and the absence of agents that disrupt hydrogen bonding. Hybridization typically is performed in two phases: the "binding" phase and the "washing" phase.

Functionally Equivalent DNA Variants

Yet another class of DNA variants within the scope of the disclosure may be described with reference to the product they encode. These functionally equivalent polynucleotides are characterized by the fact that they encode the same peptide sequences due to the degeneracy of the genetic code.

It is recognized that variants of DNA molecules provided herein can be constructed in several different ways. For example, they may be constructed as completely synthetic DNAs. Methods of efficiently synthesizing oligonucleotides are widely available. See Ausubel et al., section 2.11, Supplement 21 (1993). Overlapping oligonucleotides may be synthesized and assembled in a fashion first reported by Khorana et al., J. Mol. Biol. 72:209-217 (1971); see also Ausubel et al., *supra*, Section 8.2. Synthetic DNAs preferably are designed with convenient restriction sites engineered at the 5' and 3' ends of the gene to facilitate cloning into an appropriate vector.

As indicated, a method of generating variants is to start with one of the DNAs disclosed herein and then to conduct site-directed mutagenesis. See Ausubel et al., *supra*, chapter 8, Supplement 37 (1997). In a typical method, a target DNA

is cloned into a single-stranded DNA bacteriophage vehicle. Single-stranded DNA is isolated and hybridized with an oligonucleotide containing the desired nucleotide alteration (s). The complementary strand is synthesized and the double stranded phage is introduced into a host. Some of the resulting progeny will contain the desired mutant, which can be confirmed using DNA sequencing. In addition, various methods are available that increase the probability that the progeny phage will be the desired mutant. These methods are well known to those in the field and kits are commercially available for generating such mutants.

Recombinant DNA Constructs and Expression

The present disclosure further provides recombinant DNA constructs comprising one or more of the nucleotide sequences according to the present disclosure. The recombinant constructs of the present disclosure can be used in connection with a vector, such as a plasmid, phagemid, phage or viral vector, into which a DNA molecule encoding an antibody of the disclosure or antigen-binding fragment thereof or variant thereof is inserted.

Thus, in one aspect, the present disclosure relates to a vector comprising a nucleic acid sequence according to the present disclosure.

An antibody, antigen binding portion, or variant thereof provided herein can be prepared by recombinant expression of nucleic acid sequences encoding light and heavy chains or portions thereof in a host cell. To express an antibody, antigen binding portion, or variant thereof recombinantly a host cell can be transfected with one or more recombinant expression vectors carrying DNA fragments encoding the light and/or heavy chains or portions thereof such that the light and heavy chains are expressed in the host cell. Standard recombinant DNA methodologies are used to prepare and/or obtain nucleic acids encoding the heavy and light chains, incorporate these nucleic acids into recombinant expression vectors and introduce the vectors into host cells, such as those described in Sambrook, Fritsch and Maniatis (eds.), Molecular Cloning; A Laboratory Manual, Second Edition, Cold Spring Harbor, N.Y., (1989), Ausubel, F. M. et al. (eds.) Current Protocols in Molecular Biology, Greene Publishing Associates, (1989) and in U.S. Pat. No. 4,816,397 by Boss et al.

In addition, the nucleic acid sequences encoding variable regions of the heavy and/or light chains can be converted, for example, to nucleic acid sequences encoding full-length antibody chains, Fab fragments, or to scFv. The VL- or VH-encoding DNA fragment can be operatively linked, (such that the amino acid sequences encoded by the two DNA fragments are in-frame) to another DNA fragment encoding, for example, an antibody constant region or a flexible linker. The sequences of human heavy chain and light chain constant regions are known in the art (see e.g., Kabat, E. A., et al. (1991) Sequences of Proteins of Immunological Interest, Fifth Edition, U.S. Department of Health and Human Services, NIH Publication No. 91-3242) and DNA fragments encompassing these regions can be obtained by standard PCR amplification.

To create a polynucleotide sequence that encodes a scFv, the VH- and VL-encoding nucleic acids can be operatively linked to another fragment encoding a flexible linker such that the VH and VL sequences can be expressed as a contiguous single-chain protein, with the VL and VH regions joined by the flexible linker (see e.g., Bird et al. (1988) Science 242:423-426; Huston et al. (1988) Proc. Natl. Acad. Sci. USA 85:5879-5883; McCafferty et al., Nature (1990) 348:552-554).

To express the antibodies, antigen binding fragments thereof or variants thereof standard recombinant DNA expression methods can be used (see, for example, Goeddel; Gene Expression Technology. Methods in Enzymology 185, 5 Academic Press, San Diego, Calif. (1990)). For example, DNA encoding the desired polypeptide can be inserted into an expression vector which is then transfected into a suitable host cell. Suitable host cells are prokaryotic and eukaryotic cells. Examples for prokaryotic host cells are e.g. bacteria, 10 examples for eukaryotic hosts cells are yeasts, insects and insect cells, plants and plant cells, transgenic animals, or mammalian cells. Introduction of the recombinant construct into the host cell can be carried out using standard techniques such as calcium phosphate transfection, DEAE dextran mediated transfection, electroporation, transduction or phage infection.

In some embodiments, the DNAs encoding the heavy and light chains are inserted into separate vectors. In other embodiments, the DNA encoding the heavy and light chains 20 is inserted into the same vector. It is understood that the design of the expression vector, including the selection of regulatory sequences is affected by factors such as the choice of the host cell, the level of expression of protein desired and whether expression is constitutive or inducible.

Thus, in a further aspect, the present disclosure relates to an isolated cell expressing the antibody or antigen-binding fragment according to the present disclosure and/or comprising the nucleic acid according to the present disclosure or the vector according to the present disclosure.

The isolated cell can be virtually any cell for which expression vectors are available. The isolated cell can for example a higher eukaryotic host cell, such as a mammalian cell, a lower eukaryotic host cell, such as a yeast cell, and may be a prokaryotic cell, such as a bacterial cell.

In a further aspect, the present disclosure relates to a method of producing the isolated antibody or antigen-binding fragment according to the present disclosure comprising culturing of the cell according to the present disclosure. In particular embodiments, the cell according to the 35 present disclosure is cultivated under suitable conditions for antibody expression and the antibody or antigen-binding fragment thereof is recovered. In particular embodiments, the antibody or antigen-binding fragment thereof is purified, particularly to at least 95% homogeneity by weight.

Bacterial Expression

Useful expression vectors for bacterial use are constructed by inserting a DNA sequence encoding a desired protein together with suitable translation initiation and termination signals in operable reading phase with a functional promoter. The vector will comprise one or more phenotypic selectable markers and an origin of replication to ensure maintenance of the vector and, if desirable, to provide amplification within the host. Suitable prokaryotic hosts for transformation include but are not limited to *E. coli*, *Bacillus subtilis*, *Salmonella typhimurium* and various species within the genera *Pseudomonas*, *Streptomyces*, and *Staphylococcus*.

Bacterial vectors may be, for example, bacteriophage-, plasmid- or phagemid-based. These vectors can contain a selectable marker and a bacterial origin of replication derived from commercially available plasmids typically containing elements of the well-known cloning vector pBR322 (ATCC 37017). Following transformation of a suitable host strain and growth of the host strain to an appropriate cell density, the selected promoter is de-repressed/induced by appropriate means (e.g., temperature shift or chemical induction) and cells are cultured for an

additional period. Cells are typically harvested by centrifugation, disrupted by physical or chemical means, and the resulting crude extract retained for further purification.

In bacterial systems, a number of expression vectors may be advantageously selected depending upon the use intended for the protein being expressed. For example, when a large quantity of such a protein is to be produced, for the generation of antibodies or to screen peptide libraries, for example, vectors which direct the expression of high levels of fusion protein products that are readily purified may be desirable.

Therefore, an embodiment of the present disclosure is an expression vector comprising a nucleic acid sequence encoding for the novel antibodies of the present disclosure.

Antibodies of the present disclosure or antigen-binding fragments thereof or variants thereof include naturally purified products, products of chemical synthetic procedures, and products produced by recombinant techniques from a prokaryotic host, including, for example, *E. coli*, *Bacillus subtilis*, *Salmonella typhimurium* and various species within the genera *Pseudomonas*, *Streptomyces*, and *Staphylococcus*, preferably, from *E. coli* cells.

Mammalian Expression

Preferred regulatory sequences for mammalian host cell expression include viral elements that direct high levels of protein expression in mammalian cells, such as promoters and/or enhancers derived from cytomegalovirus (CMV) (such as the CMV promoter/enhancer), Simian Virus 40 (SV40) (such as the SV40 promoter/enhancer), adenovirus, (e.g., the adenovirus major late promoter (AdMLP)) and polyoma. Expression of the antibodies may be constitutive or regulated (e.g. inducible by addition or removal of small molecule inductors such as Tetracyclin in conjunction with Tet system). For further description of viral regulatory elements, and sequences thereof, see e.g., U.S. Pat. No. 5,168,062 by Stinski, U.S. Pat. No. 4,510,245 by Bell et al. and U.S. Pat. No. 4,968,615 by Schaffner et al.. The recombinant expression vectors can also include origins of replication and selectable markers (see e.g., U.S. Pat. Nos. 4,399,216, 4,634,665 and 5,179,017). Suitable selectable markers include genes that confer resistance to drugs such as G418, puromycin, hygromycin, blasticidin, zeocin/bleomycin or methotrexate or selectable marker that exploit auxotrophies such as Glutamine Synthetase (Bebbington et al., Biotechnology (N Y). 1992 February; 10 (2): 169-75), on a host cell into which the vector has been introduced. For example, the dihydrofolate reductase (DHFR) gene confers resistance to methotrexate, neo gene confers resistance to G418, the bsd gene from *Aspergillus terreus* confers resistance to blasticidin, puromycin N-acetyl-transferase confers resistance to puromycin, the Sh ble gene product confers resistance to zeocin, and resistance to hygromycin is conferred by the *E. coli* hygromycin resistance gene (hyg or hph). Selectable markers like DHFR or Glutamine Synthetase are also useful for amplification techniques in conjunction with MTX and MSX.

Transfection of the expression vector into a host cell can be carried out using standard techniques such as electroporation, nucleofection, calcium-phosphate precipitation, lipofection, polycation-based transfection such as polyethylenimine (PEI)-based transfection and DEAE-dextran transfection.

Suitable mammalian host cells for expressing the antibodies, antigen binding fragments thereof or variants thereof provided herein include Chinese Hamster Ovary (CHO cells) such as CHO-K1, CHO-S, CHO-K1SV [including dhfr-CHO cells, described in Urlaub and Chasin, (1980)

Proc. Natl. Acad. Sci. USA 77:4216-4220 and Urlaub et al., Cell. 1983 June; 33 (2):405-12, used with a DHFR selectable marker, e.g., as described in R. J. Kaufman and P. A. Sharp (1982) Mol. Biol. 159:601-621; and other knockout cells exemplified in Fan et al., Biotechnol Bioeng. 2012 April; 109 (4):1007-15], NS0 myeloma cells, COS cells, HEK293 cells, HKB11 cells, BHK21 cells, CAP cells, EB66 cells, and SP2 cells.

Expression might also be transient or semi-stable in expression systems such as HEK293, HEK293T, HEK293-EBNA, HEK293E, HEK293-6E, HEK293-Freestyle, HKB11, Expi293F, 293EBNALT75, CHO Freestyle, CHO-S, CHO-K1, CHO-K1SV, CHOEBNALT85, CHOS-XE, CHO-3E7 or CAP-T cells (for instance Durocher et al., Nucleic Acids Res. 2002 Jan. 15; 30 (2): E9).

In some embodiments, the expression vector is designed such that the expressed protein is secreted into the culture medium in which the host cells are grown. The antibodies, antigen binding fragments thereof or variants thereof can be recovered from the culture medium using standard protein purification methods.

Purification

Antibodies of the disclosure or antigen-binding fragments thereof or variants thereof can be recovered and purified from recombinant cell cultures by well-known methods including, but not limited to ammonium sulfate or ethanol precipitation, acid extraction, Protein A chromatography, Protein G chromatography, anion or cation exchange chromatography, phospho-cellulose chromatography, hydrophobic interaction chromatography, affinity chromatography, hydroxylapatite chromatography and lectin chromatography. High performance liquid chromatography ("HPLC") can also be employed for purification. See, e.g., Colligan, Current Protocols in Immunology, or Current Protocols in Protein Science, John Wiley & Sons, NY, N.Y., (1997-2001), e.g., Chapters 1, 4, 6, 8, 9, 10, each entirely incorporated herein by reference.

Antibodies of the present disclosure or antigen-binding fragments thereof or variants thereof include naturally purified products, products of chemical synthetic procedures, and products produced by recombinant techniques from a eukaryotic host, including, for example, yeast, higher plant, insect and mammalian cells. Depending upon the host employed in a recombinant production procedure, the antibody of the present disclosure can be glycosylated or can be non-glycosylated. Such methods are described in many standard laboratory manuals, such as Sambrook, supra, Sections 17.37-17.42; Ausubel, supra, Chapters 10, 12, 13, 16, 18 and 20.

In preferred embodiments, the antibody is purified (1) to greater than 95% by weight of antibody as determined e.g. by the Lowry method, UV-Vis spectroscopy or by SDS-Capillary Gel electrophoresis (for example on a Caliper LabChip GXII, GX 90 or Biorad Bioanalyzer device), and in further preferred embodiments more than 99% by weight,

(2) to a degree sufficient to obtain at least 15 residues of N-terminal or internal amino acid sequence, or (3) to homogeneity by SDS-PAGE under reducing or non-reducing conditions using Coomassie blue or, preferably, silver stain.

Isolated naturally occurring antibody includes the antibody in situ within recombinant cells since at least one component of the antibody's natural environment will not be present. Ordinarily, however, isolated antibody will be prepared by at least one purification step.

Therapeutic Methods

Therapeutic methods involve administering to a subject in need of treatment a therapeutically effective amount of an

antibody or an antigen-binding fragment thereof or a variant thereof contemplated by the disclosure. A “therapeutically effective” amount hereby is defined as the amount of an antibody or antigen-binding fragment thereof that is of sufficient quantity to decrease Sema3A activity in a subject either as a single dose or according to a multiple dose regimen, alone or in combination with other agents, which leads to the alleviation of an adverse condition, yet which amount is toxicologically tolerable. The subject may be a human or non-human animal (e.g., rabbit, rat, mouse, dog, monkey or other lower-order primate).

Thus, in one aspect, the present disclosure relates to the isolated antibody or antigen-binding fragment according the present disclosure or to a conjugate comprising the isolated antibody or antigen-binding fragment according the present disclosure or to a pharmaceutical composition comprising the isolated antibody or antigen-binding fragment according the present disclosure for use as a medicament.

The isolated antibody or antigen-binding fragment according to the present disclosure can be used as a therapeutic or a diagnostic tool in a variety of Sema3A-associated disorders.

Thus, in a further aspect, the present disclosure relates to the isolated antibody or antigen-binding fragment according the present disclosure or to a conjugate comprising the isolated antibody or antigen-binding fragment according the present disclosure or to a pharmaceutical composition comprising the isolated antibody or antigen-binding fragment according the present disclosure for use in the treatment and/or prevention of renal diseases, in particular of acute and chronic kidney diseases, diabetic kidney diseases, Alport syndrome and of acute and chronic renal failure. The general terms ‘renal disease’ or ‘kidney disease’ describes a class of conditions in which the kidneys fail to filter and remove waste products from the blood. There are two major forms of kidney disease: acute kidney disease (acute kidney injury, AKI) and chronic kidney disease (CKD). The isolated antibody or antigen-binding fragment according to the present disclosure or a conjugate or pharmaceutical composition comprising the same may further be used for the treatment and/or prevention of sequelae of acute kidney injury arising from multiple insults such as ischemia-reperfusion injury, radiocontrast administration, cardiopulmonary bypass surgery, shock and sepsis. In the context of the present disclosure, the terms renal failure and renal insufficiency comprise both acute and chronic manifestations of renal insufficiency, as well as underlying or related kidney diseases such as renal hypoperfusion, intradialytic hypotension, obstructive uropathy, glomerulopathies, IgA nephropathy, glomerulonephritis, acute glomerulonephritis, glomerulosclerosis, tubulointerstitial diseases, nephropathic diseases such as primary and congenital kidney disease, nephritis, Alport syndrome, kidney inflammation, immunological kidney diseases such as kidney transplant rejection, immune complex-induced kidney diseases, nephropathy induced by toxic substances, contrast medium-induced nephropathy; minimal change glomerulonephritis (lipoid); Membranous glomerulonephritis; focal segmental glomerulosclerosis (FSGS); hemolytic uremic syndrome (HUS); amyloidosis, Goodpasture’s syndrome, Wegener’s granulomatosis, Purpura Schönlein-Henoch, diabetic and non-diabetic nephropathy, pyelonephritis, renal cysts, nephrosclerosis, hypertensive nephrosclerosis and nephrotic syndrome, which can be characterized diagnostically, for example, by abnormally reduced creatinine and/or water excretion, abnormally increased blood concentrations of urea, nitrogen, potassium and/or creatinine, altered activity of renal enzymes such as, for example,

glutamyl synthetase, altered urine osmolarity or urine volume, increased microalbuminuria, macroalbuminuria, lesions of glomeruli and arterioles, tubular dilatation, hyperphosphatemia and/or the need for dialysis. The present disclosure also relates to the isolated antibody or antigen-binding fragment according to the present disclosure or a conjugate or pharmaceutical composition comprising same for use in the treatment and/or prevention of sequelae of renal insufficiency, for example pulmonary edema, heart failure, uremia, anemia, electrolyte disturbances (e.g. hyperkaliemia, hyponatremia) and disturbances in bone and carbohydrate metabolism. The compounds according to the disclosure are also suitable for the treatment and/or prevention of polycystic kidney disease (PCKD) and of the syndrome of inadequate ADH secretion (SIADH).

Additionally, the isolated antibody or antigen-binding fragment according to the present disclosure or a conjugate or pharmaceutical composition comprising the same may be used for the treatment and/or prevention of vascular hyperpermeability, diabetic retinopathy, deterioration of the blood retinal barrier and consequent macular edema, preferably, age related macular edema, non-proliferative age-related macular edema and non-proliferative diabetic macular edema.

Further, the isolated antibody or antigen-binding fragment according to the present disclosure or a conjugate or pharmaceutical composition comprising same is suitable for the prevention or treatment of disease of the central or peripheral nervous system like neuropathic pain, spinal cord injury, multiple sclerosis, traumatic brain injury, brain edema or neurodegenerative diseases in which the neurodegenerative disease is Alzheimer’s disease, Parkinson’s disease, Huntington’s disease, amyotrophic lateral sclerosis, progressive 35 supranuclear paralysis, black substance degeneration, Shy-Drager syndrome, olivopontocerebellar atrophy or spinocerebellar degeneration.

Furthermore, the isolated antibody or antigen-binding fragment according to the present disclosure or a conjugate 40 or pharmaceutical composition comprising the same may be useful for the treatment and/or prevention of cancer, wherein the cancer is intestinal cancer, colorectal cancer, lung cancer, breast cancer, brain cancer, melanoma, renal cell cancer, leukemia, lymphoma, T-cell lymphoma, stomach cancer, pancreatic cancer, cervical cancer, endometrial cancer, ovarian cancer, esophageal cancer, liver cancer, squamous cell carcinoma of the head and neck, skin cancer, urinary tract cancer, prostate cancer, choriocarcinoma, pharyngeal cancer or larynx cancer.

The disorders mentioned above have been well characterized in humans, but also exist with a similar etiology in other animals, including mammals, and can be treated by administering pharmaceutical compositions according to the present disclosure.

The antibody or the antigen-binding fragment according to the present disclosure or a variant thereof might be co-administered with known medicaments, and in some instances the antibody or antigen-binding fragment thereof might itself be modified. For example, an antibody or an antigen-binding fragment thereof or a variant thereof could be conjugated to a drug or to another peptide or protein to potentially further increase efficacy.

Antibodies of the present disclosure or antigen-binding fragments thereof or variants thereof may be administered as the sole pharmaceutical agent or in combination with one or more additional therapeutic agents where the combination causes no unacceptable adverse effects.

Thus, in a further aspect, the present disclosure relates to the isolated antibody or antigen-binding fragment according to the present disclosure or the conjugate according to the present disclosure or the pharmaceutical composition according to the present disclosure for use in simultaneous, separate, or sequential combination with one or more further therapeutically active compounds.

Non-limiting examples of therapeutically active compounds to be used in combination with the antibody or antigen-binding fragment according to the present disclosure are:

blood pressure lowering agents, for example and preferably from the group of calcium antagonists, angiotensin II antagonists, ACE inhibitors, NEP inhibitors, vaso-peptidase inhibitors, endothelin antagonists, renin inhibitors, alpha-blockers, beta-blockers, mineralocorticoid receptor antagonists and diuretics; antidiabetic agents (hypoglycemic or antihyperglycemic agents), such as for example and preferably insulin and derivatives, sulfonylureas, biguanides, thiazolidinediones, acarbose, DPP4 inhibitors, GLP-1 analogues, or SGLT inhibitors (gliflozins); compounds inhibiting the signal transduction cascade, in particular tyrosine and/or serine/threonine kinase inhibitors, such as for example nintedanib, dasatinib, nilotinib, bosutinib, regorafenib, sorafenib, sunitinib, cediranib, axitinib, telatinib, imatinib, brivanib, pazopanib, vatalanib, gefitinib, erlotinib, lapatinib, canertinib, lestaurtinib, pelitinib, semaxanib or tandutinib; anti-inflammatory drugs such as non-steroidal anti-inflammatory drugs (NSAIDs) including acetylsalicylic acid (aspirin), ibuprofen and naproxen, glucocorticoids such as for example and preferably prednisolone, prednisolon, methylprednisolone, triamcinolone, dexamethasone, beclomethasone, betamethasone, flunisolide, budesonide or fluticasone, or 5-aminosalicylic acid derivatives, leukotriene antagonists, TNF-alpha inhibitors and chemokine receptor antagonists such as CCR1, 2 and/or 5 inhibitors, NF- κ B inhibitors and Nrf2 activators; anti-fibrotic drugs such as TGFbeta antagonist, or microRNA-21 inhibitors; organic nitrates and NO-donors, for example sodium nitroprusside, nitroglycerin, isosorbide mononitrate, isosorbide dinitrate, molsidomine or SIN-1, and inhalational NO; compounds that inhibit the degradation of cyclic guanosine monophosphate (cGMP), for example inhibitors of phosphodiesterases (PDE) 1, 2, 5 and/or 9, in particular PDE-5 inhibitors such as sildenafil, vardenafil, tadalafil, udenafil, dasantafil, avanafil, mirodenafil, lodenafil, CTP-499 or PF-00489791; calcium sensitizers, such as for example and preferably levosimendan; antithrombotic agents, particularly selected from the group consisting of platelet aggregation inhibitors, anti-coagulants and profibrinolytic substances; agents, that stimulate NO- and heme-dependent as well as

NO- and heme-independent the synthesis of cGMP, for example and with preference soluble guanylate cyclase (sGC) modulators, for example and with preference riociguat, cinaciguat, vericiguat or BAY 1101042; fat metabolism altering agents, for example and preferably from the group of thyroid receptor agonists, cholesterol synthesis inhibitors, such as for example and preferably HMG-COA-reductase or squalene synthesis inhibitors, ACAT inhibitors, CETP inhibitors, MTP inhibitors, PPAR-alpha, PPAR-gamma and/or PPAR-

delta agonists, cholesterol absorption inhibitors, lipase inhibitors, polymeric bile acid adsorbers, bile acid reabsorption inhibitors and lipoprotein (a) antagonists.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a platelet aggregation inhibitor, particularly aspirin, clopidogrel, ticlopidine or dipyridamole.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a thrombin inhibitor, particularly ximelagatran, dabigatran, melagatran, bivalirudin or enoxaparin.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a GPIIb/IIIa antagonist, particularly tirofiban or abciximab.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a factor Xa inhibitor, particularly selected from rivaroxaban, apixaban, otamixaban, fidexaban, razaxaban, fondaparinux, idraparinux, DU-176b, PMD-3112, YM-150, KFA-1982, EMD-503982, MCM-17, MLN-1021, DX 9065a, DPC 906, JTV 803, SSR-126512 and SSR-128428.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with heparin or a low molecular weight (LMW) heparin derivative.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a vitamin K antagonist, particularly selected from coumarin.

Blood pressure lowering agents are particularly selected from the group consisting of calcium antagonists, angiotensin II antagonists, ACE inhibitors, NEP inhibitors, vaso-peptidase inhibitors, endothelin antagonists, renin inhibitors, alpha-blockers, beta-blockers, mineralocorticoid receptor antagonists and diuretics.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a calcium antagonist, particularly selected from nifedipine, amlodipine, verapamil and diltiazem.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an angiotensin II receptor antagonist, particularly selected from the group consisting of losartan, candesartan, valsartan, telmisartan, irbesartan, olmesartan, eprosartan, embursartan and azilsartan.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an ACE inhibitor, particularly selected from the group consisting of enalapril, captopril, lisinopril, ramipril, delapril, fosinopril, quinopril, perindopril, benazepril and trandzapril.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an endothelin antagonist, particularly selected from the group consisting of bosentan, darusentan, ambrisentan, tezosentan, sitaxsentan, avosentan, macitentan and atrasentan.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a renin inhibitor, particularly selected from the group consisting of aliskiren, SPP-600 and SPP-800.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a mineralocorticoid receptor antagonist, particularly selected from the group consisting of finerenone, spironolactone, canrenone, potassium canrenoate, eplerenone, esaxerenone (CS-3150), or aperanone (MT-3995), CS-3150, and MT-3995.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a diuretic, particularly selected from the group consisting of furosemide, bumetanide, piretanide, torsemide, bendroflumethiazide, chlorothiazide, hydrochlorothiazide, xipamide, indapamide, hydroflumethiazide, methyclothiazide, polythiazide, trichloromethiazide, chlorothalidone, metolazone, quinethazone, acetazolamide, dichlorophenamide, methazolamide, glycerine, isosorbide, mannitol, amiloride and triamterene.

Fat metabolism altering agents are particularly selected from the group consisting of CETP inhibitors, thyroid receptor agonists, cholesterol synthesis inhibitors such as HMG-CoA-reductase or squalene synthesis inhibitors, ACAT inhibitors, MTP inhibitors, PPAR-alpha, PPAR-gamma and/or PPAR-delta agonists, cholesterol absorption inhibitors, polymeric bile acid adsorbers, bile acid reabsorption inhibitors, lipase inhibitors and lipoprotein (a) antagonists.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a Nrf2 activator, particularly selected from Bardoxolone methyl.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a thyroid receptor agonist, particularly selected from the group consisting of D-thyroxin, 3,5,3'-triiodothyronin (T3), CGS 23425 and axitirome (CGS 26214).

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an HMG-COA-reductase inhibitor from the class of statins, particularly selected from the group consisting of lovastatin, simvastatin, pravastatin, fluvastatin, atorvastatin, rosuvastatin and pitavastatin.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a PPAR-gamma modulator, particularly selected from pioglitazone and rosiglitazone.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a PPAR-delta modulator, particularly selected from the group consisting of ASP1128, GW 501516 and BAY 68-5042.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a cholesterol absorption inhibitor, particularly selected from the group consisting of ezetimibe, tiqueside and pamaqueside.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a lipase inhibitor, particularly selected from orlistat.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a polymeric bile acid adsorber, particularly selected from the group consisting of cholestyramine, colestipol, colesolvam, CholestaGel and colestimide.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a bile acid reabsorption inhibitor, particularly selected from the group consisting of ASBT (IBAT) inhibitors such as AZD-7806, S-8921, AK-105, BARI-1741, SC-435 and SC-635.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a lipoprotein (a) antagonist, particularly selected from the group consisting of gemcabene calcium (CI-1027) and nicotinic acid.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a TGFbeta antagonist, particularly selected from pirenidone and fresolimumab.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with anti-microRNA-21 oligonucleotides, particularly selected from Lademirsene.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with HIF-PH inhibitors, particularly selected from molidustat and roxadustat.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a CCR2 antagonist, particularly selected from CCX-140.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a TNFalpha antagonist, particularly selected from adalimumab.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a galectin-3 inhibitor, particularly selected from GCS-100.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a hepatocyte growth factor mimeticmimetics, particularly selected from Refanalin.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a p53 modulator, particularly selected from QPI-1002.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a NOX1/4 inhibitor, particularly selected from GKT-137831.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a medicament which affects the vitamin D metabolism, particularly selected from cholecalciferol and paracalcitol.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a cytostatic agent, particularly selected from cyclophosphamide.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with anti-VEGF therapy, particularly selected from the group consisting of ranibizumab, bevacizumab and affibercept.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an immunosuppressive agent, particularly selected from ciclosporin.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is

administered in combination with a phosphate binder, particularly selected from sevelamer and lanthanum carbonate.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a calcimimetic for therapy of hyperparathyroidism.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with agents for iron deficit therapy, particularly selected from iron products.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with agents for the therapy of hyperurikaemia, particularly selected from allopurinol and rasburicase.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with glycoprotein hormone for the therapy of anaemia, particularly selected from erythropoietin.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with biologics for immune therapy, particularly selected from the group consisting of abatacept, rituximab, eculizumab and belimumab.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with Jak inhibitors, particularly selected from the group consisting of ruxolitinib, tofacitinib, baricitinib, CYT387, GSK2586184, lesartan, pacritinib (SB1518) and TG101348.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with prostacyclin analogs for therapy of microthrombi.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an alkali therapy, particularly selected from sodium bicarbonate.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an mTOR inhibitor, particularly selected from everolimus and rapamycin.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an NHE3 inhibitor, particularly selected from AZD1722.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with an eNOS modulator, particularly selected from sapropterin.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with a CTGF inhibitor, particularly selected from FG-3019.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with one or more additional therapeutic agents selected from the group consisting of diuretics, angiotensin AI antagonists, ACE inhibitors, beta-receptor blockers, mineralocorticoid receptor antagonists, antidiabetics, organic nitrates and NO donors, activators and stimulators of the soluble guanylate cyclase (sGC), and positive-inotropic agents.

In particular embodiments, the isolated antibody or antigen-binding fragment according to the present disclosure is administered in combination with one or more additional

therapeutic agents selected from the group consisting of diuretics, angiotensin AI antagonists, ACE inhibitors, beta-receptor blockers, mineralocorticoid receptor antagonists, antidiabetics, organic nitrates and NO donors, activators and stimulators of the soluble guanylate cyclase (sGC), positive-inotropic agents, anti-inflammatory agents, immunosuppressive agents, phosphate binders and antibodies which modulate vitamin D metabolism.

Combination therapy includes administration of a single pharmaceutical dosage formulation which comprises the antibody or antigen-binding fragment according to the present disclosure or a variant thereof and one or more additional therapeutic agents, as well as administration of the antibody or antigen-binding fragment according to the present disclosure and each additional therapeutic agent in its own separate pharmaceutical dosage formulation. For example, an antibody of the disclosure or an antigen-binding fragment thereof or a variant thereof and a therapeutic agent may be administered to the patient together in a single liquid composition, or each agent may be administered in separate dosage formulation.

Where separate dosage formulations are used, the antibody or antigen-binding fragment according to the present disclosure or the variant thereof and one or more additional therapeutic agents may be administered at essentially the same time (e.g., concurrently) or at separately staggered times (e.g., sequentially).

The antibody or the antigen-binding fragment according to the present disclosure or a variant thereof might be used in combination with surgical interventions, including but not limited to:

major cardiovascular surgeries e.g. coronary artery bypass grafting (CABG), heart valve repair or replacement, insertion of a pacemaker or an implantable cardioverter defibrillator (ICD), maze surgery, aneurysm repair, aortid artery surgery/endarterectomy and thrombectomy;
major non-cardiac surgeries e.g., thoracic, orthopedic urologic surgeries.

Diagnostic Methods

Furthermore, the antibody or antigen-binding fragment according to the present disclosure may be utilized, as such or in compositions, in research and diagnostics, or as analytical reference standards, and the like.

Anti-Sema3A antibodies or antigen-binding fragments thereof can be used for detecting the presence of Sema3A. Thus, in a further aspect, the present disclosure relates to the isolated antibody or antigen-binding fragment according to the present disclosure or the antibody conjugate according to the present disclosure for use as a diagnostic agent.

Pharmaceutical Compositions and Administration

In a further aspect, the present disclosure relates to a pharmaceutical composition comprising the isolated antibody or antigen-binding fragment according to the present disclosure or the antibody conjugate according to the present disclosure. To treat any of the foregoing disorders, pharmaceutical compositions for use in accordance with the present disclosure may be formulated in any conventional manner using one or more physiologically acceptable carriers, excipients, or auxiliaries. Further details on techniques for formulation and administration may be found in the latest edition of Remington's Pharmaceutical Sciences (Ed. Maack Publishing Co, Easton, Pa.).

The antibody or antigen-binding fragment according to the present disclosure can be administered by any suitable means, which can vary, depending on the type of disorder being treated. Possible administration routes include oral,

parenteral, and topical administration. Methods of parenteral delivery include intra-arterial, intramuscular, subcutaneous, intramedullary, intrathecal, intraventricular, intravenous, intraperitoneal, or intransal administration. In addition, the antibody or antigen-binding fragment according to the present disclosure may be administered by pulse infusion, with, e.g., declining doses of the antibody. Preferably, administration is by injections, most preferably intravenous or subcutaneous injections, depending in part on whether the administration is brief or prolonged. The amount to be administered will depend on a variety of factors such as the clinical symptoms, weight of the individual, whether other drugs are administered, and the like. The skilled artisan will recognize that the route of administration will vary depending on the disorder or condition to be treated.

The pharmaceutical composition according to the present disclosure comprises the antibody or antigen-binding fragment according to the present disclosure alone or in combination with at least one other agent, such as a stabilizing compound. The antibody or antigen-binding fragment according to the present disclosure may be administered in any sterile, biocompatible pharmaceutical carrier, including, but not limited to, saline, buffered saline, dextrose, and water. In particular embodiments, the pharmaceutical composition according to the present disclosure may comprise one or more further pharmaceutically active compounds, in particular one or more further pharmaceutically active compounds that are suitable to treat Sema3A associated disorders. Any of these agents can be administered to a patient alone, or in combination with other agents or drugs, in pharmaceutical compositions where it is mixed with excipient(s) or pharmaceutically acceptable carriers. In particular embodiments, the pharmaceutically acceptable carrier is pharmaceutically inert.

Pharmaceutical compositions for oral administration can be formulated using pharmaceutically acceptable carriers well known in the art in dosages suitable for oral administration. Such carriers enable the pharmaceutical compositions to be formulated as tablets, pills, dragees, capsules, liquids, gels, syrups, slurries, suspensions and the like, for ingestion by the patient.

Pharmaceutical preparations for oral use can be obtained through combination of active compounds with solid excipient, optionally grinding a resulting mixture, and processing the mixture of granules, after adding suitable auxiliaries, if desired, to obtain tablets or dragee cores. Suitable excipients are carbohydrate or protein fillers such as sugars, including lactose, sucrose, mannitol, or sorbitol; starch from corn, wheat, rice, potato, or other plants; cellulose such as methylcellulose, hydroxypropylmethylcellulose, or sodium carboxymethyl cellulose; and gums including arabic and tragacanth; and proteins such as gelatin and collagen. If desired, disintegrating or solubilizing agents may be added, such as the cross-linked polyvinyl pyrrolidone, agar, alginic acid, or a salt thereof, such as sodium alginate.

Dragee cores can be provided with suitable coatings such as concentrated sugar solutions, which may also contain gum arabic, talc, polyvinyl pyrrolidone, carbopol gel, polyethylene glycol and/or titanium dioxide, lacquer solutions, and suitable organic solvents or solvent mixtures. Dyestuffs or pigments may be added to the tablets or dragee coatings for product identification or to characterize the quantity of active compound, i.e. dosage.

Pharmaceutical preparations that can be used orally include push-fit capsules made of gelatin, as well as soft, sealed capsules made of gelatin and a coating such as glycerol or sorbitol. Push-fit capsules can contain active

ingredients mixed with a filler or binders such as lactose or starches, lubricants such as talc or magnesium stearate, and optionally, stabilizers. In soft capsules, the active compounds may be dissolved or suspended in suitable liquids, such as fatty oils, liquid paraffin, or liquid polyethylene glycol with or without stabilizers.

Pharmaceutical formulations for parenteral administration include aqueous solutions of active compounds. For injection, the pharmaceutical compositions of the disclosure may be formulated in aqueous solutions, preferably in physiologically compatible buffers such as Hank's solution, Ringer's solution, or physiologically buffered saline. Aqueous injection suspensions may contain substances that increase viscosity of the suspension, such as sodium carboxymethyl cellulose, sorbitol, or dextran. Additionally, suspensions of the active compounds may be prepared as appropriate oily injection suspensions. Suitable lipophilic solvents or vehicles include fatty oils such as sesame oil, or synthetic fatty acid esters, such as ethyl oleate or triglycerides, or liposomes. Optionally, the suspension may also contain suitable stabilizers or agents which increase the solubility of the compounds to allow for the preparation of highly concentrated solutions.

For topical or nasal administration, penetrants appropriate to the particular barrier to be permeated are used in the formulation. Such penetrants are generally known in the art.

The pharmaceutical compositions of the present disclosure may be manufactured in a manner that is known in the art, e.g., by means of conventional mixing, dissolving, granulating, dragee-making, levigating, emulsifying, encapsulating, entrapping or lyophilizing processes.

The pharmaceutical composition may be provided as a salt and can be formed with acids, including but not limited to hydrochloric, sulfuric, acetic, lactic, tartaric, malic, succinic, etc. Salts tend to be more soluble in aqueous or other protonic solvents that are the corresponding free base forms. In other cases, the preferred preparation may be a lyophilized powder in 1 mM-50 mM histidine or phosphate or Tris, 0.1%-2% sucrose and/or 2%-7% mannitol at a pH range of 4.5 to 7.5 optionally comprising additional substances like polysorbate that is combined with buffer prior to use.

After pharmaceutical compositions comprising a compound of the disclosure formulated in an acceptable carrier have been prepared, they can be placed in an appropriate container and labeled for treatment of an indicated condition. For administration of anti-Sema3A antibodies or antigen-binding fragment thereof, such labeling would include amount, frequency and method of administration.

Therapeutically Effective Dose

The determination of an effective dose is well within the capability of those skilled in the art. Determining a therapeutically effective amount of the novel antibody of this disclosure or an antigen-binding fragment thereof or a variant thereof, largely will depend on particular patient characteristics, route of administration, and the nature of the disorder being treated. General guidance can be found, for example, in the publications of the International Conference on Harmonization and in REMINGTON'S PHARMACEUTICAL SCIENCES, chapters 27 and 28, pp. 484-528 (18th ed., Alfonso R. Gennaro, Ed., Easton, Pa.: Mack Pub. Co., 1990). More specifically, determining a therapeutically effective amount will depend on such factors as toxicity and efficacy of the medicament. Toxicity may be determined using methods well known in the art and found in the foregoing references. Efficacy may be determined utilizing

the same guidance in conjunction with the methods described below in the Examples.

For any compound, the therapeutically effective dose can be estimated initially either in cell culture assays, or in animal models, usually mice, rabbits, dogs, pigs or monkeys. The animal model is also used to achieve a desirable concentration range and route of administration. Such information can then be used to determine useful doses and routes for administration in humans.

A therapeutically effective dose refers to that amount of antibody or antigen-binding fragment thereof, that ameliorates the symptoms or condition. Therapeutic efficacy and toxicity of such compounds can be determined by standard pharmaceutical procedures in cell cultures or experimental animals, e.g., ED₅₀ (the dose therapeutically effective in 50% of the population) and LD₅₀ (the dose lethal to 50% of the population). The dose ratio between therapeutic and toxic effects is the therapeutic index, and it can be expressed as the ratio, ED₅₀/LD₅₀. Pharmaceutical compositions that exhibit large therapeutic indices are preferred. The data obtained from cell culture assays and animal studies are used in formulating a range of dosage for human use. The dosage of such compounds lies preferably within a range of circulating concentrations that include the ED₅₀ with little or no toxicity. The dosage varies within this range depending upon the dosage form employed, sensitivity of the patient, and the route of administration.

The exact dosage is chosen by the individual physician in view of the patient to be treated. Dosage and administration are adjusted to provide sufficient levels of the active moiety or to maintain the desired effect. Additional factors that may be taken into account include the severity of the disease state, age, weight and gender of the patient; diet, time and frequency of administration, drug combination(s), reaction sensitivities, and tolerance/response to therapy. Long acting pharmaceutical compositions might be administered for example every 3 to 4 days, every week, once every two weeks, or once every three weeks, depending on half-life and clearance rate of the particular formulation.

Normal dosage amounts may vary from 0.1 to 100,000 micrograms, up to a total dose of about 10 g, depending upon the route of administration. Guidance as to particular dosages and methods of delivery is provided in the literature. See U.S. Pat. Nos. 4,657,760; 5,206,344; or 5,225,212. Kits

In a further aspect, the present disclosure relates to a kit comprising the isolated antibody or antigen-binding fragment according to the present disclosure or the conjugate according to the present disclosure and instructions for use. In particular embodiments, the kit comprises one or more containers filled with one or more of the ingredients of the aforementioned compositions of the disclosure. Associated with such container(s) can be a notice in the form prescribed by a governmental agency regulating the manufacture, use or sale of pharmaceuticals or biological products, reflecting approval by the agency of the manufacture, use or sale of the product for human administration.

DRAWINGS

FIG. 1A: Effects of Sema3A inhibition with TPP-15370 (grey bar), TPP-11489 (striped bar) and TPP-17755 (squared bar) on Sema3A-induced albumin excretion in mice. Shown are mean±S.D. (n=10). ***, ****:p<0.001 p<0.0001 vs. isotype control. Dunnett's post hoc test.

FIG. 1B: Effects of Sema3A inhibition with TPP-23298 (grey bars), TPP-11489 (dotted bar) and TPP-17755 (striped

bar) on Sema3A-induced albumin excretion in mice. Shown are mean±S.D. (n=10). ***, ****:p<0.001 p<0.0001 vs. isotype control. Dunnett's post hoc test.

FIG. 2A: Sema3A induced albuminuria in mice after treatment with TPP-15370 (white circles) and TPP-23298 (black circles) in comparison to TPP-11489 (black triangles). The comparisons were performed in two separate experiments. Shown are mean values. (n=10). n.s.=statistically not significant vs. TPP-15370; *:p<0.05 vs. TPP-23298. Unpaired T-test.

FIG. 2B: Sema3A induced albuminuria in mice after treatment with TPP-15370 (white circles) and TPP-23298 (black circles) in comparison to TPP-17755 (black squares). The comparisons were performed in two separate experiments. Shown are mean values. (n=10). n.s.=statistically not significant vs. TPP-15370; *:p<0.05 vs. TPP-23298. Unpaired T-test.

FIG. 2C: Sema3A induced albuminuria in mice after treatment with TPP-15370 (white circles) and TPP-23298 (black circles) in comparison to TPP-30788 (black rhombus). The comparisons were performed in two separate experiments. Shown are mean values. (n=10). n.s.=statistically not significant vs. TPP-15370; *:p<0.05 vs. TPP-23298. Unpaired T-test.

FIGS. 3A-3C: Effects of Sema3A inhibition with TPP-23374 (dotted bars) TPP-23298 (grey bars) and TPP-15370 (striped bars) on FIG. 3A: serum creatinine levels, FIG. 3B: serum urea levels and FIG. 3C: urinary albumin excretion after I/R injury in mice. Shown are mean±S.D. (n=8-10). *, **, ***:p<0.05, p<0.01, p<0.0001 vs. isotype control. Dunnett's post hoc test.

FIGS. 4A-4C: Effects of Sema3A inhibition with TPP-15370 (grey bars), TPP-11489 (striped bars) and TPP-17755 (squared bars) on FIG. 4A: serum creatinine levels, FIG. 4B: serum urea levels and FIG. 4C: urinary albumin excretion after I/R injury in mice. Shown are mean±S.D. (n=8-10). *, **, ***:p<0.05, p<0.01, p<0.0001 vs. isotype control. Dunnett's post hoc test.

FIGS. 5A-5C: Effects of Sema3A inhibition with TPP-23298 (grey bars), TPP-11489 (striped bars) and TPP-17755 (squared bars) on FIG. 5A: serum creatinine levels, FIG. 5B: serum urea levels and FIG. 5C: urinary albumin excretion after I/R injury in mice. Shown are mean±S.D. (n=10-12). *, **, ***:p<0.05, p<0.01, p<0.0001 vs. isotype control. Dunnett's post hoc test.

FIGS. 6A-6C: Effects of Sema3A inhibition with TPP-15374 (grey bars), TPP-11489 (striped bars) on FIG. 6A: serum creatinine levels, FIG. 6B: serum urea levels and FIG. 6C: urinary albumin excretion after I/R injury in mice. Shown are mean±S.D. (n=10-12). *, **, ***:p<0.05, p<0.01, p<0.0001 vs. isotype control. Dunnett's post hoc test.

FIG. 7: Effects of Sema3A inhibition with TPP-15370 (grey bars), TPP-11489 (striped bars) on proteinuria in 55 Alport mice. Shown are mean±S.D. (n=8-10). ****: p<0.0001 vs. isotype control. Dunnett's post hoc test.

FIGS. 8A-8D: Effects of Sema3A inhibition with TPP-15370 (grey bars), TPP-11489 (striped bars)) on FIG. 8A: serum creatinine levels, FIG. 8B: serum urea levels and fibrosis FIG. 8C: myofibroblast and FIG. 8D: collagen deposition in Alport mice. Shown are mean±S.D. ***, ****:p<0.05, p<0.01, p<0.0001 vs. isotype control. Dunnett's post hoc test. (n=8-10). *, **,

FIGS. 9A-9D: Effects of Sema3A inhibition with TPP-23298 in a single dose preventive setting in a unilateral kidney IRI model in pigs, 105 min of ischemia. TPP-23298 (FIG. 9A; black dots) or control IgG (open circles) (10

mg/kg) were given 30 min before inflating the balloon in the left renal artery. Values from SHAM animals are indicated diamonds. Time course of plasma creatinine concentrations of individual animals (FIG. 9A), and time course of mean change of creatinine plasma concentrations versus base line values at start of experimentation (0 h) (FIG. 9B). Mean values of creatinine clearance for 24-27 h interval. Creatinine clearance side separated for left (damaged) and right (non-damaged) kidneys and kidneys from sham animals (FIG. 9C). Global creatinine clearance (FIG. 9D); means \pm SEM, p-value in (FIG. 9B) from t-test, */***/ in (FIG. 9C) and FIG. 9D): p<0.05/0.001, one-way ANOVA versus corresponding control followed by Dunnett's multiple comparison

FIGS. 10A-10C: Schematic representation of a sandwich-based epitope binning experiment using SPR (see also Example 5A): FIG. 10A) One antibody is immobilized to a SPR chip, Sema3A is injected, and the binding is monitored; FIG. 10B) A second (competitive) antibody is injected on to the complex of the immobilized mAb bound to Sema3A, and the binding is monitored; FIG. 10C) A second (non-competitive) antibody is injected on to the complex of the immobilized mAb bound to Sema3A, and the binding is monitored.

FIGS. 11A-11C: HRA image analysis steps: FIG. 11A) Fluorescence microscopy image of DAPI/CM cells; FIG. 11B) Identification of cells in the selected area; FIG. 11C) Calculation of cells-free region size (grey area).

FIG. 12: The percent inhibition of Sema3A in a HUVEC repulsion assay at an antibody concentration of 80 pM is shown (see Example 11). Each column represents one antibody in the following left to right order: TPP-23298 (black column), TPP-30788, TPP-TPP-30789, TPP-30790, and TPP-30791.

EXAMPLES

Example 1: Sema3A Sequences and Tool Generation

TABLE 2

Tools used in this disclosure				
TPP-No.	Protein	Boundaries [aa]	Uniprot ID	Catalog No.
TPP-13211	Human Semaphorin3A-Fc (R&D Systems)	26-771	Q14563	1250-S3
No TPP-No.	Human Semaphorin3G (Abnova)	1-782	Q9NS98	H00056920-P01
No TPP-No.	Human Semaphorin3F-Fc (R&D Systems)	19-772	Q13275	9878-S3
TPP-13357	Mouse Semaphorin3A-Fc (R&D Systems)	21-747	O08665	5926-S3
TPP-19068	Human Semaphorin3A - Sema Domain	21-569	Q14563	Produced inhouse
TPP-19069	Mouse Semaphorin3A - Sema Domain	21-569	O08665	Produced inhouse
TPP-19122	Cyto Semaphorin3A - Sema Domain	21-569	Q63548	Produced inhouse
TPP-19120	Rat Semaphorin3A - Sema Domain	21-569	E2QX94	Produced inhouse
TPP-19121	Dog Semaphorin3A - Sema Domain	21-569	A0A2K5VGJ0	Produced inhouse
TPP-20176	Pig Semaphorin3A - Sema Domain	49-658	A0A480WHT2	Produced inhouse

Sema3A domains were produced by mammalian cell culture using transiently transfected HEK293-6E cells (National Research Council Canada). All constructs were under

the control of a CMV promoter and sequences contain a C-terminal FXa cleavage site followed by a 6x his-tag. Cell culture was performed using F17 medium (Life Technologies) supplemented with 0.1% pluronic F68 (Life Technologies) and 4 mM Glutamax (Life Technologies) 24 h post-transfection, 1% FCS ultra-low IgG (Life Technologies) and 0.5 mM valproic acid (Sigma Aldrich) were added. Cell supernatant was sterile filtered and subsequently purified or concentrated via crossflow filtration prior to purification.

10 Sema3A domains were purified using a two-step purification consisting of affinity and size exclusion chromatography. In brief, cell culture supernatant was loaded on to a Ni²⁺-NTA column (GE Healthcare) connected to an Äkta Avant system (GE Healthcare). Column was equilibrated with 4 CV of 50 mM NaH₂PO₄, 300 mM NaCl, pH 8 and washed afterwards with 10 CV of running buffer until baseline was reached. Elution was carried out using 6 CV of 15 running buffer containing 250 mM imidazole, pH 8.0. Fractions of the elution peak were unified, concentrated using a 20 Vivaflow 200 Hydrosart membrane (cut-off 10 kDa, Sartorius) and subjected to size exclusion chromatography using a Superdex 200 column (GE Healthcare) connected to an Äkta Pure 25 system. The column was equilibrated and run in DPBS, pH 7.4. Fractions of the domain elution peak were 25 unified and concentrated using a Vivaflow 200 Hydrosart membrane (cut-off 10 kDa, Sartorius). The final protein quality was assessed on an analytical size exclusion chromatography (Superdex 200) for purity and monodispersity as well as SDS-PAGE. Sema domains were aliquoted and 30 snap frozen in liquid nitrogen and stored at -80° C. until further use.

Example 2: Antibody Generation from BioInvent Antibody Libraries

35 A fully human antibody phage display library (BioInvent n-CoDeR Fab lambda library) was used to isolate human monoclonal antibodies of the present disclosure by selection against recombinant human Sema3A (TPP-13211, R&D Systems) using the following protocol. Briefly, Immuno-

tubes (Nunc) were coated for one hour at room temperature (RT) with the 100 µg of the target molecule (huSema3A) or an irrelevant Fc-containing off-target in 1 ml PBS (Phos-

phate Buffered Saline) with end-over-end rotation. The target and depletion antigen-coated immunotube as well as an empty immunotube were washed 4 times with PBS+ 0.05% Tween20 (PBST) and subsequently blocked using 3 ml of a 3% Milk powder in PBST solution for 1 h at RT with end-over-end rotation. An aliquot of the phage library was thawed and allowed to block in a solution of 3% milk powder in PBST for 1 h at RT with end-over-end rotation. The non-coated depletion immunotube was washed 3 times in 4 ml PBS before addition of the blocked phage library and incubation with end-over-end rotation for 30 min at RT. This step was repeated for the non-target antigen-coated depletion immunotube. The huSema3A-coated immunotube was washed 3 times in 4 ml PBS before addition of the depleted library and incubation for 90 min at room temperature with end-over-end rotation. After stringent washing (4 x with 4 ml PBST and 1 x with 4 ml PBS) Fab-expressing phages binding specifically to the coated target were eluted using 500 µl 100 nM TEA, 10 min incubation at room temperature followed by neutralization by addition of 500 µl Tris-HCl pH 7.5. 500 µl of eluted phage were used to infect *Escherichia coli* strain HB101. Subsequently the phages were amplified in *Escherichia coli* strain HB101 using M13KO7 Helper Phage (Invitrogen™). In two subsequent selection rounds the target concentration was decreased to 25 µg/ml. For a first qualitative assessment, 88 randomly picked Fab-expressing phage clones from each selection round were expressed in single wells and tested for binding to huSema3A compared to an irrelevant off-target. The clone pool from Round 3 in this example was found to contain a 60% positive hit rate and was chosen for further screening.

In a next step, the expression of soluble Fabs was enabled by bulk removal of the gene III fusion in this pool and 2208 single clones were picked for expression in *Escherichia coli* strain Top10 and evaluation of Fab-containing supernatants in a huSema3A binding ELISA. The VH and VL sequences for all 2208 clones was also determined using NGS methods. 154 distinct clones positive for binding to huSema3A were identified. These positive binding Fab fragments were tested in a confirmatory binding ELISA and were also evaluated for binding to mouse Sema3A-Fc (TPP-13357, R&D Systems) as well as specificity testing using an additional off target molecule, murine Sema3F (R&D Systems). Based on this analysis, 48 human/mouse cross-reactive Sema3A binding Fabs were prioritized. These Fab fragments were subsequently purified from 25 ml expression cultures using Capture Select CH1 matrix (LifeTechnologies), eluted using 12.5 mM Citric acid at pH 2.5 and finally buffer exchanged to PBS using a Zeba™ Spin desalting plate (ThermoFisher). A kinetic ranking was performed for all 48 purified Fab fragments by surface plasmon resonance (SPR), examining the binding to both human and mouse Sema3A and reformatted in to a full-length human IgG1 and again tested for binding in SPR (see Example 4).

Example 3: Sequence Optimization, Germlining & Affinity Maturation of Lead Antibodies TPP-15370 and TPP-15374

IgG1 antibodies TPP-15370 and TPP-15374 were subjected to lead optimization procedures aiming to (i) optimize its affinity, (ii) increase functional efficiency, (iii) reduce the risk of sequence-based immunogenicity and (iv) improve compatibility with downstream development processes.

Affinity maturation was done by a first single mutation gathering round followed by recombination of the most

affinity- and potency-increasing amino acid exchanges in a germlined and sequence optimized antibody backbone.

For mutation gathering NNK (N=A or G or C or T, K=G or T) randomizations at the following individual amino acid positions were generated by site directed mutagenesis using synthetic oligonucleotides including NNK for codon-diversification. For TPP-15370 the following regions were analyzed for their effect on affinity: GFTFSSYGMH (residues 26 to 35 of VH SEQ ID NO: 41), WVSAGTGGDTYY-
10 ADSVMG (residues 47 to 65 of VH SEQ ID NO: 41), ARRDDYTSRDAFDV (residues 96 to 109 of VH SEQ ID NO: 41), SGSSSNIGSNTVNWY (residues 23 to 37 of VL SEQ ID NO: 45), LLIYYDDLLPS (residues 47 to 57 of VL SEQ ID NO: 45), and AAWDDSLNGYVV (residues 90 to 15 101 of VL SEQ ID NO: 45).

For TPP-15374 the following regions were analyzed for their effect on affinity: GFTFSSYEMN (residues 26 to 35 of VH SEQ ID NO: 61), WVSGISWNNSGSIYGADSVKG (residues 47 to 66 of VH SEQ ID NO: 61), ARSGYSSS-
20 WFDPDFDY (residues 97 to 112 of VH SEQ ID NO: 61), TGSSSNIGAGYDVHWY (residues 23 to 38 of VL SEQ ID NO: 65), LLIYGNNSNRP (residues 48 to 58 of VL SEQ ID NO: 65), and SSYAGSNPYV (residues 91 to 101 of VL SEQ ID NO: 65).

The resulting single NNK libraries were sequenced and about 1000 single amino acid exchange variants of TPP15370 and TPP-15374, respectively, were identified. They were expressed by transient transfection of mammalian cells and resulting expression supernatants were normalized in terms of antibody concentrations to be screened in surface plasmon resonance and competition ELISA.

For the germlining and sequence optimization process of TPP-15370 and TPP-15374 the closest germline families for light and heavy chain were selected and scrutinized for potential CMC relevant residues. Deviations from closest human germlines in CDR regions and FW regions and potential CMC relevant residues in CDR regions were adjusted by site directed mutagenesis and tested for in functional and biophysical assays (unspecific binding, temperature stability in DSC). The resulting single reversions and following combinatorial IgG variants were expressed by transient transfection of mammalian cells and resulting expression supernatants were normalized in terms of antibody concentrations to be screened in binding assays (SPR, competition ELISA) and functional assays. This led to germlined and sequence optimized molecules TPP-21565 for TPP-15370 and TPP-18533 for TPP-15374. TPP-21565 carries in comparison to TPP-15370 reversions L55R and R80Q in the light chain and G33A, H35S, M64K and V109Y in the heavy chain. TPP-18533 carries in comparison to TPP-15374 reversions A10V, T13A, S78T, R81Q, S82A in the light chain.

For the final recombination library of TPP-21565 eight single substitution variants that were shown in the NNK library screening step to exhibit improved affinity and functional efficiency were selected. Light chain mutations A90H, G98D, G98V, Y99I and V100P and heavy chain mutations S30Y, S35L and T53Y were recombined in one recombination library (continuous amino acid nomenclature, reference 60 is TPP-21565 as defined by SEQ ID NOS: 121-VH and 125-VL).

For the final recombination library of TPP-18533 eleven single substitution variants that were shown in the NNK library screening step to exhibit improved affinity and functional efficiency were selected. Light chain mutations N28D, N53A, S91K, S91Q, A94E, S96I and S96P and heavy chain mutations T28D, S30D, S57W and G59Y were recombined

in one recombination library (continuous amino acid nomenclature, reference is TPP-18533 as defined by SEQ ID NOs: 101-VH and 105-VL).

For TPP-18533 oligonucleotides were generated to introduce selected mutations or the corresponding wild type amino acid at each selected position. Library construction was performed using sequential rounds of overlap extension PCR. The final PCR product was ligated into a mammalian IgG4 (S228P) expression vector and variants were sequenced using massive-parallel sequencing techniques. For TPP-21565 the recombinatorial variants were designed as distinct clones and cloned into an IgG4 (S228P) containing expression plasmid.

More than 1000 unique combinatorial amino acid exchange variants of TPP-18533 and more than 100 unique combinatorial variants of TPP-21565 were generated in that way, expressed by transient transfection of mammalian cells, and resulting expression supernatants were normalized in terms of antibody concentrations to be screened in varying number in SPR, competition ELISA and functional assays. Based on the result in these assays, mutants were either categorized as ‘improved’ or ‘non-improved’.

Table 1 and 1A lists i.a. preferred antibodies candidates according to the present disclosure that were selected in the combination library screening step as being most potent in terms of binding to Sema3A and in terms of antagonizing the Sema3A-dependent biological activity as well as the respective amino acid and nucleic acid sequences of antibodies according to the present disclosure.

Example 4: Determination of Affinity and Species Cross-Reactivity Using Surface Plasmon Resonance

To assess the binding kinetics and affinity of anti-Sema3A antibodies as well as their species cross-reactivity profile, binding assays were conducted using surface plasmon resonance (SPR). Binding assays were performed on a Biacore T200 instrument or on a Biacore 8K+ instrument (Cytiva) at 25° C. using assay buffer HBS P+, 300 mM NaCl, 0.75 mM CaCl₂, 2.5 mM MgCl₂, 1 mg/ml BSA, 0.05% NaN₃. Antibodies were captured either via anti-human Fc IgGs (“Human antibody capture kit”, Order No. BR100839, Cytiva) or in case of Fc-tagged analytes by anti-human Fab IgGs (“Human Fab capture kit”, Order No. 28958325, Cytiva) covalently amine coupled to a Series S CM5 sensor chip (Cytiva). The amine coupling was carried out according to the manufacturer’s instructions using 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide hydrochloride (EDC), N-hydroxysuccinimide (NHS) and ethanolamine HCl, pH 8.5 (“Amine Coupling Kit” BR-1000-50, Cytiva.). For phage display hits Fc-tagged human and mouse Sema3A was used as analytes in a concentration range from 1.56-200 nM. Human, mouse, cynomolgus, rat, dog and pig monovalent Sema3A domain were used as analytes in a concentration series from 0.024-3.125 nM in multi cycle kinetics mode or in 100 nM for binding analysis only. The sensor surface was regenerated with glycine pH 2.0 after each antigen injection. Obtained sensograms were double referenced (subtraction of reference flow cell signal and buffer injection) and were fitted to a 1:1 Langmuir binding model to derive kinetic data using the Biacore T200 Evaluation software. Results are shown in Tables 3,4 and 4a.

TABLE 3

Affinity of anti-Sema3A IgG1 antibodies derived from phage display hits determined by SPR using TPP-13211 and TPP-13357.		
	Mouse K _D [M]	Human K _D [M]
TPP-15355	4.0E-09	3.5E-09
TPP-15356	n.b.	3.2E-09
TPP-15357	1.0E-07	5.0E-08
TPP-15358	3.1E-09	9.5E-10
TPP-15359	n.b.	1.1E-08
TPP-15360	1.1E-07	7.2E-09
TPP-15361	n.b.	5.5E-09
TPP-15362	n.b.	n.b.
TPP-15363	n.b.	2.4E-09
TPP-15364	n.b.	2.6E-09
TPP-15365	2.4E-07	6.5E-08
TPP-15366	1.4E-08	1.3E-08
TPP-15367	5.4E-09	2.2E-09
TPP-15368	8.2E-07	1.5E-07
TPP-15369	4.1E-08	3.5E-08
TPP-15370	3.2E-09	2.8E-09
TPP-15371	7.4E-09	4.5E-09
TPP-15372	n.b.	3.7E-09
TPP-15373	2.0E-07	1.3E-07
TPP-15374	1.8E-08	1.8E-08
TPP-15375	5.8E-09	5.2E-09
TPP-15376	8.4E-09	5.8E-09
TPP-15377	3.3E-09	1.9E-09
TPP-15378	n.d.	1.2E-08
TPP-15379	4.3E-07	2.1E-07
TPP-15380	n.b.	n.b.
TPP-15381	9.9E-09	3.3E-09
TPP-15382	2.5E-07	1.9E-07
TPP-15383	5.3E-08	2.8E-08
TPP-15384	9.6E-09	9.1E-09
TPP-15385	8.5E-09	7.2E-09
TPP-15386	n.b.	n.b.
TPP-15387	1.6E-07	1.1E-07
TPP-15388	1.7E-07	1.3E-08
TPP-15389	4.2E-09	2.8E-09
TPP-15390	9.8E-08	5.7E-08
TPP-15391	n.b.	7.0E-09
TPP-15392	n.d.	n.d.
TPP-15393	5.9E-08	9.3E-09
TPP-15394	n.d.	n.d.
TPP-15395	1.1E-06	2.2E-07
TPP-15396	6.2E-09	2.1E-09
TPP-15397	2.7E-07	9.7E-09
TPP-15398	8.5E-09	8.4E-09
TPP-15399	1.9E-07	1.5E-07
TPP-15400	4.9E-09	4.6E-09
TPP-15401	7.6E-07	1.2E-08

n.b. = no binding,

n.d. = not determinable

The majority of phage display hits bind to human and mouse dimeric Sema3A in the lower nanomolar range.

TABLE 4

Affinity of anti-Sema3A antibodies derived from TPP-15370 and TPP-15374 determined by SPR using TPP-19068, TPP-19069, TPP-19122, TPP-19120, TPP-19121, TPP-20176 as analytes as well as prior art antibodies (TPP-30972 was purified from HEK cell expression).

Nomenclature	Mouse K_D [M]	Pig K_D [M]	Cyno K_D [M]	Dog K_D [M]	Human K_D [M]	Rat K_D [M]
TPP-11489 (Chiome)	1.6E-07	1.0E-07	6.3E-08	5.0E-08	7.3E-08	3.3E-08
TPP-17755 (Samsung)	3.9E-09	4.0E-09	1.4E-08	7.5E-09	6.9E-09	5.4E-09
TPP-30791 (BI clone IV)	2.8E-11	2.9E-11	5.7E-11	7.8E-11	1.2E-11	1.7E-11
TPP-30790 (BI clone III)	4.0E-11	3.6E-11	7.7E-11	1.0E-10	1.5E-11	2.2E-11
TPP-30789 (BI clone II)	4.2E-11	3.9E-11	7.9E-11	1.1E-10	2.2E-11	2.6E-11
TPP-30788 (BI clone I)	4.3E-11	3.8E-11	7.8E-11	1.1E-10	1.8E-11	2.6E-11
TPP-30792 (3H4 Univ Ramot)	no binding	no binding	no binding	no binding	no binding	no binding
TPP-15370	7.2E-09	9.0E-09	4.0E-08	2.2E-08	1.0E-08	1.4E-08
TPP-23298	7.4E-11	6.7E-11	7.8E-11	7.0E-11	8.7E-11	3.0E-11
TPP-23334	6.2E-11	1.4E-11	1.5E-11	8.4E-12	2.1E-11	5.6E-11
TPP-23337	5.0E-11	1.1E-11	2.6E-11	4.5E-12	5.0E-11	1.1E-10
TPP-23338	4.5E-11	4.6E-11	4.2E-11	5.3E-11	5.4E-11	
TPP-23340	5.9E-11	6.2E-11	6.0E-11	5.8E-11	2.2E-11	
TPP-23341	9.2E-11	8.6E-11	8.7E-11	8.4E-11	9.1E-11	
TPP-23345	6.3E-11	5.5E-11	6.2E-11	4.6E-11	6.5E-11	
TPP-23346	6.4E-11	5.8E-11	6.1E-11	6.1E-11	7.2E-11	
TPP-23347	5.5E-11	5.3E-11	5.4E-11	5.1E-11	6.0E-11	
TPP-23373	8.3E-11	7.8E-11	7.2E-11	1.0E-10	1.1E-10	
TPP-23374	1.6E-11	below 3 pM	below 3 pM	7.3E-12	8.1E-12	3.3E-12
TPP-23375	4.2E-11	4.7E-11	4.5E-11	4.5E-11	5.3E-11	
TPP-15374	8.3E-09	7.2E-09	4.6E-08	1.9E-08	1.5E-08	9.8E-09
TPP-18533	8.1E-09		6.4E-09		8.7E-09	
TPP-25497					5.2E-11	
TPP-25256					4.9E-11	
TPP-25255					5.1E-11	
TPP-25257					5.3E-11	
TPP-25248					5.0E-11	
TPP-25064					4.9E-11	
TPP-26111					5.2E-11	
TPP-25224					4.9E-11	
TPP-25448					5.3E-11	
TPP-25655					4.9E-11	

All derivative antibodies of TPP-15370 and TPP-15374 have a significantly increased affinity to the Sema3A domain in the lower picomolar range compared to their parental antibodies as well as to most prior art antibodies.

TABLE 4a

Nomenclature	Human K_D [M]
TPP-23298	1.3E-10
TPP-17755 (Samsung)	6.2E-09
TPP-11489 (Chiome)	n.d.
TPP-30788 (BI clone I)	9.8E-11
TPP-31357 (Fab of 3H4 Univ Ramot)	3.5E-10

n.d. = not determinable due to multiphasic behaviour

In contrast to the full length 3H4 IgG1 (TPP-30792) which showed no binding in SPR to Sema3A molecules, the Fab variant of TPP-30792, TPP-31357 shows binding to human Sema3A, but with less affinity as TPP-23298.

Example 5: Determination of Binding Activity Using Surface Plasmon Resonance

To assess the binding activity of anti-Sema3A antibodies binding assays were conducted using surface plasmon resonance (SPR). Binding assays were performed on a Biacore T200 instrument (Cytiva) at 25° C. using assay buffer HBS P+, 300 mM NaCl, 0.75 mM CaCl₂, 2.5 mM MgCl₂, 1 mg/ml BSA, 0.05% NaN₃. Antibodies were captured via anti-human Fc IgGs ("Human antibody capture kit", Order No. BR100839, Cytiva) covalently amine coupled to a Series S CM5 sensor chip (Cytiva). The amine coupling was carried out according to the manufacturer's instructions using 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide hydrochloride (EDC), N-hydroxysuccinimide (NHS) and ethanolamine HCl, pH 8.5 ("Amine Coupling Kit" BR-1000-50, Cytiva.). Human, mouse, cynomolgus, rat, dog and pig monovalent Sema3A domain were used as analytes in a concentration series from 0.024-3.125 nM in multi cycle kinetics mode. The sensor surface was regenerated with glycine pH 2.0 after each antigen injection. Obtained sensograms were double referenced (subtraction of reference flow cell signal and buffer injection) and were fitted to a 1:1 Langmuir binding model using the Biacore T200 Evaluation software obtaining the experimental fitted R_{Max} value. To

calculate the binding activity first the theoretical R_{Max} needs to be calculated according to equation 1:

$$R_{Max} = \frac{R_{Ligand} * Mr_{Analyte} * Valency_{Ligand}}{Mr_{Ligand}}$$

Equation 1: Theoretical calculation of R_{Max} . R_{Ligand} =Ligand Level in RU, Mr =molecular weight, $Valency_{Ligand}$ =number of binding sites per antibody molecule, here 2

Binding activity was determined by dividing the experimental determined R_{Max} by the theoretical calculated R_{Max} according to equation 2:

$$\text{Activity in \%} = \frac{R_{Max \text{ experimental}}}{R_{Max \text{ theoretical}}} * 100$$

Equation 2: Calculation of binding activity in %

TABLE 5

Summary of ligand levels after capture, experimental, theoretical and binding activity of tested antibodies					
Ligand	Analyte	Ligand Level [RU]	Experimental Rmax [RU]	Theoretical Rmax [RU]	Binding Activity [%]
TPP-11489 (Chiome)	Rat	798	212	681	31
TPP-15370	Sema3A	53	51	45	113
TPP-15374	domain	53	42	45	94
TPP-17755 (Samsung)		54	26	46	56
TPP-23298		46	42	39	108
TPP-30791 (BI clone IV)		46	42	39	109
TPP-30790 (BI clone III)		62	50	53	94
TPP-30789 (BI clone II)		50	44	42	104
TPP-30788 (BI clone I)		46	43	40	109
TPP-11489 (Chiome)	Dog	797	148	680	22
TPP-15370	Sema3A	53	51	45	114
TPP-15374	domain	53	44	45	98
TPP-17755 (Samsung)		54	25	46	55
TPP-23298		45	42	39	107
TPP-30791 (BI clone IV)		47	43	40	106
TPP-30790 (BI clone III)		61	48	52	92
TPP-30789 (BI clone II)		50	44	43	102
TPP-30788 (BI clone I)		47	42	40	106
TPP-11489 (Chiome)	Pig	801	525	684	77
TPP-15370	Sema3A	53	50	45	111
TPP-15374	domain	53	47	45	103
TPP-17755 (Samsung)		54	28	46	60
TPP-23298		46	42	39	107
TPP-30791 (BI clone IV)		49	44	42	105
TPP-30790 (BI clone III)		61	48	52	92
TPP-30789 (BI clone II)		51	45	43	103
TPP-30788 (BI clone I)		47	43	40	107
TPP-11489 (Chiome)	Cyno	800	85	682	13
TPP-15370	Sema3A	53	63	45	139
TPP-15374	domain	53	47	45	104
TPP-17755 (Samsung)		53	24	45	53
TPP-23298		46	41	39	106
TPP-30791 (BI clone IV)		47	43	40	107
TPP-30790 (BI clone III)		62	48	52	92
TPP-30789 (BI clone II)		50	44	42	103
TPP-30788 (BI clone I)		47	43	40	107
TPP-11489 (Chiome)	Human	798	257	681	38
TPP-15370	Sema3A	53	51	45	112
TPP-15374	domain	53	45	45	101
TPP-17755 (Samsung)		54	25	46	55
TPP-23298		46	42	39	107
TPP-30791 (BI clone IV)		48	44	41	107
TPP-30790 (BI clone III)		61	48	52	93
TPP-30789 (BI clone II)		49	45	42	106

TABLE 5-continued

Summary of ligand levels after capture, experimental, theoretical and binding activity of tested antibodies						
5	Ligand	Analyte	Ligand Level [RU]	Experimental Rmax [RU]	Theoretical Rmax [RU]	Binding Activity [%]
10	TPP-30788 (BI clone I)		47	43	40	107
	TPP-11489 (Chiome)	Mouse	796	803	680	118
	TPP-15370	Sema3A	53	50	45	111
	TPP-15374	domain	53	48	45	106
	TPP-17755 (Samsung)		54	26	46	57
	TPP-23298		46	42	39	108
15	TPP-30791 (BI clone IV)		47	43	40	107
	TPP-30790 (BI clone III)		62	49	52	93
	TPP-30789 (BI clone II)		51	45	43	103
	TPP-30788 (BI clone I)		47	43	40	108

20 The binding activity calculated in the SPR experiment is a measure of the activity of the surface-attached ligand. As can be seen from Table 5, TPP-15370, TPP-15374, TPP-23298 and TPPs 30788-30791 are able to bind to all tested Sema3A domains with around 100% activity meaning all binding regions are fully able to bind. Prior art antibody TPP-17755 only reaches an activity level of 50-60% depending on the species. Prior art antibody TPP-11489 shows an even more reduced level of below 50%, except for mouse and pig where it is higher. Strikingly, to reach such 25 an activity level, the ligand level of TPP-11489 needs to be over 10-fold higher as compared to the other antibodies pointing in general to a much lower binding activity as compared to TPP-15370, TPP-15374 and TPP-23298.

35 Example 6: Competition ELISA

For screening in a competition ELISA setup, human Sema3a (TPP-13211) was coated onto 384-well plates (Greiner bio-one, 781077) with a concentration of 0.5 µg/ml 40 in coating buffer (Carbonate-Basis pH 9.6, Candor 121125) over night at 10° C. After washing the plates 3 times with 50 µl PBS 0.05% Tween the plates were blocked with 50 µl Smart Block® (Candor 113500) for 1 h at 20° C. and washed again 3 times as described.

45 Subsequently, 20 µl of pre-mixed antibody solution was added to the plates and incubate for 18 h at 10° C. For the pre-mixed antibody solution, for each well, one biotinylated, parental antibody being either TPP-15370 or TPP-15374 was mixed in a ratio 1:1, 1:5 or 5:1 with an antibody 50 containing one or more amino acid variations within its CDR regions (recombination variants) and not containing any biotin tag. As additional controls an isotype control antibody not demonstrating any binding to human Sema3A was also used as competition antibody. The total concentration of the added antibody solution was 0.25 µg/ml. During 55 the incubation time the antibodies bound to the plates in a competitive manner as they compete for the same epitope on the human Sema3A protein.

After subsequent washing with 50 µl PBS 0.05% Tween 60 for 3 times, 20 µl of a Streptavidin-HRP solution (R&D Systems, DY998, 1:200 in PBS 0.05% Tween 10% Smart Block) were added and incubated for 1 h and 20° C. followed by subsequent washing 3 times with 50 µl PBS 0.05% Tween and addition of 20 µl Amplex Red solution 65 (Invitrogen A12222, 1:1000 in NaP-buffer 50 mM pH7.6 with 1:10000 of 30% H2O2). After a final incubation for 20 min at 20° C. the signal was determined using an emission

wavelength of 595 nm and excitation of 530 nm. Due to the biotinylation of the parental antibodies TPP-15370 and TPP-15374 only the binding of these variants can be detected. Hence, competition with an antibody variant demonstrating superior binding shows a lower binding signal in comparison to e.g. competition of the parental antibody with a non-biotinylated version of itself.

In total, 103 recombination variants of TPP-15370 and 1136 recombination variants for TPP-15374 were measured. For analysis, and to allow for correction of plate-to-plate variations, the ELISA raw values were normalized to the value of the competition with the isotype control antibody TPP-9809.

Table 6 lists the values for the competition ELISA for selected recombination variants of TPP-15370 and TPP-15374. Depicted are the ratios vs. the isotype control antibody TPP-9809 in the measurement with a 1 to 5 or a 1 to 1 ratio, respectively.

TABLE 6

Values for the competition ELISA for recombination variants of TPP-15374 and TPP-15370. Depicted are the ratios vs. the isotype control antibody for selected recombination variants, respectively, when normalized to the isotype control antibody TPP-9809 in the measurement with a 1 to 5 or a 1 to 1 ratio, respectively

TPP-15374 family		TPP-15370 family		
TPP Number	VAL norm to TPP-9809 (1 to 5 ratio)	VAL norm to TPP-9809 (1 to 1 ratio)	TPP Number	VAL norm to TPP-9809 (1 to 5 ratio)
TPP-15374	0.41	0.69	TPP-15370	0.54
TPP-9809	1.00	1.00	TPP-9809	1.00
TPP-25497	0.26	0.39	TPP-23298	0.09
TPP-25256	0.15	0.41	TPP-23334	0.11
TPP-25255	0.17	0.37	TPP-23337	0.14
TPP-25257	0.18	0.36	TPP-23338	
TPP-25248	0.20	0.36	TPP-23340	
TPP-25064	0.19	0.48	TPP-23341	0.18
TPP-26111	0.18	0.49	TPP-23345	0.08
TPP-25224	0.17	0.43	TPP-23346	0.13
TPP-25448	0.19	0.47	TPP-23347	0.16
TPP-25655	0.23	0.39	TPP-23373	0.20
			TPP-23374	0.08
			TPP-23375	0.16
				0.30

Example 5a: Epitope Binning Using Surface Plasmon Resonance (SPR)

An epitope binning experiment was performed to determine the epitope bins of anti-Sema3A antibodies using SPR by employing a classical sandwich approach. In this experiment, one antibody is immobilized to a SPR chip, Sema3A is injected, and the binding is monitored (FIG. 10A). After successful binding of Sema3A to the first antibody, a second antibody is injected on to the complex of the immobilized mAb bound to Sema3A and the additional binding is monitored (FIG. 10B and FIG. 10C). If the second antibody competes with the first antibody for the binding to Sema3A than no additional binding signal is detected after injection of the second antibody, showing that the two antibodies bind to the same or very adjacent Sema3A epitope (FIG. 10C). If the second antibody does not compete with the first antibody for the binding to Sema3A than an additional binding signal is detected after injection of the second antibody, showing that the two antibodies bind to different Sema3A epitopes (FIG. 10B).

Experiments were performed on a Biacore T200 instrument (Cytiva) at 25° C. using assay buffer HBS P+, 300 mM NaCl, 0.75 mM CaCl₂, 2.5 mM MgCl₂, 1 mg/ml BSA, 0.05% NaN₃. Antibodies were covalently amine coupled to a Series S CM5 sensor chip (Cytiva). The amine coupling was carried out according to the manufacturer's instructions using 1-ethyl-3-(3-dimethylaminopropyl) carbodiimide hydrochloride (EDC), N-hydroxysuccinimide (NHS) and ethanolamine HCl, pH 8.5 ("Amine Coupling Kit" BR-1000-50, Cytiva.). Human, monovalent Sema3A domain was used as first analyte in a concentration of 200 nM followed by a second injection of the competitor antibody. This setup was performed with all possible combinations. The sensor surface was regenerated with glycine pH 2.0 after each antigen injection. Table 6a shows the binning results.

TABLE 6a

Matrix view of the epitope binning results (+ = additional binding, - = no additional binding)		
First antibody/ second antibody	TPP-30788 (BI Clone I)	TPP-23298 (Samsung)
TPP-30788 (BI Clone I)	+	+
TPP-23298	+	-
TPP-17755 (Samsung)	+	-

"+" means injection of second antibody resulted in additional binding signal showing that the two tested antibodies bind to two different Sema3A epitopes
"-" means injection of second antibody did not result in additional binding signal showing that the two tested antibodies compete for binding to overlapping or adjacent epitopes Sema3A epitopes

The binning experiment strongly points to another epitope for TPP-23298 compared to TPP-30788 (BI clone I) meaning that both antibodies target an independent/different epitope on Sema3A, whereas TPP-23298 might have overlapping or adjacent epitopes with TPP-17755 (Samsung).

Example 7: Assessment of Binding to Off-Targets

To assess the specificity of an anti-Sema3A mAb (TPP-15370, parental mAb) an off-target screen using Retrogenix technology was conducted. For primary screening, 5484

expression vectors, encoding both ZsGreen1 and a full-length human plasma membrane protein or a cell-surface tethered human secreted protein, were arrayed in duplicate across 16 microarray slides. Human HEK293 cells were used for reverse transfection/expression.

The test antibody was added to each slide after cell fixation giving a final concentration of 20 µg/ml. Detection of binding was performed by using the same AF647 anti-hIgG Fc detection antibody as used in the Pre-screen. Two replicate slides were screened for each of the 16 slide-sets. Hits were classified as ‘strong, medium, weak or very weak’, depending on the intensity of the duplicate spots.

Following a screen for binding against fixed HEK293 cells expressing 5484 human plasma membrane proteins and human secreted proteins, Retrogenix’s technology identified no specific off-target interactions for test antibody TPP-15370. Binding to Sema3A—its primary target—was observed. These data indicate high specificity of TPP-15370 for its primary target.

Example 8: Selectivity of Anti-Sema3A mAbs

Semaphorin proteins can be subdivided in five classes occurring in vertebrates (class 3-7). To assess the selectivity profile of parental anti-Sema3A mAbs TPP-15370 and TPP-15374 in the Semaphorin 3 class (Sema3A-G) an ELISA assay was conducted using Sema3A, Sema3B, Sema3C, Sema3D, Sema3E, and Sema3F molecules from R&D Systems. Both antibodies showed no binding to Sema3B, Sema3C, Sema3D, Sema3E and Sema3F.

Because Sema3G has been recently identified as kidney protective (PMID: 27180624), it was important to test whether the antibodies do not bind to Sema3G. For the assessment of binding selectivity to Sema3A vs Sema3G, 1 nM recombinant human Sema3A-Fc chimera (R&D Systems) or recombinant human GST-Sema3G (Abnova) were coated on Maxisorb plates, incubated with antibodies in a dose-response curve from 0.00015-10 µg/ml, and the binding of antibodies quantified using HRP coupled anti-human antiserum and chemiluminescent substrate.

TABLE 7

Antibody	Off-target ELISA values for testing of Sema3G as off-target			
	Coating: SEMA3A	Coating: SEMA3G	SEMA3G/ SEMA3A	Selectivity Score
	EC50 [nM]			
TPP-23298	1.6	>66667	>41666	
TPP-23334	9.2	>66667	>7220	
TPP-23337	15.5	>66667	>4308	
TPP-23338	9.6	>66667	>6949	
TPP-23340	12.3	>66667	>5435	
TPP-23341	21.3	>66667	>3133	
TPP-23347	8.4	>66667	>7918	
TPP-23373	17.6	>66667	>3786	
TPP-23374	6.1	>66667	>10951	
TPP-23375	7.7	>66667	>8651	
TPP-11489 (Chiome)	Weak binding (EC50 not determinable)	>66667	n.d.	
TPP-17755 (Samsung)	Slight dose-response (not determinable)	>66667	n.d.	
TPP-30791 (BI clone IV)	0.08	>66667	>833337	
TPP-30790 (BI clone III)	0.08	>66667	>833337	
TPP-30789 (BI clone II)	0.10	>66667	>666670	
TPP-30788 (BI clone I)	0.15	>66667	>444446	

All tested antibodies of the present disclosure as well as prior art antibodies do not bind to kidney protective Sema3G, as shown in Table 7.

Sema3A is a secreted protein that contains two furin cleavage sites and is present in an active and inactive cleaved form. In the in vivo situation Sema3A exists in both forms side by side. To test if anti-Sema3A antibodies are able to differentiate between the inactive and active form and to test how antibodies perform in binding to active Sema3A (resembled by full-length Sema3A (TPP-13211) in contrast to a inactive version as it only contains the Sema3A domain (resembled by cleaved Sema3A TPP-19068), an ELISA assay was performed. As readout out the ELISA signals of the tested antibody to the active Sema3A has been divided by the ELISA signals of the tested antibody to the inactive Sema3A.

TABLE 7a

Antibody	Ratio for binding of anti-Sema3A antibodies to active vs. inactive Sema3A as determined by ELISA
	Ratio ELISA binding TPP-13211/TPP-19068*
TPP-23298	0.66 ± 0.14
TPP-30788 (BI clone I)	0.19 ± 0.03
TPP-30789 (BI clone II)	0.20 ± 0.07
TPP-30790 (BI clone III)	0.19 ± 0.03
TPP-30791 (BI clone IV)	0.21 ± 0.004

*A Ratio ELISA binding TPP-13211/TPP-19068 below 1 shows a higher binding activity to active Sema3A.

A Ratio ELISA binding TPP-13211/TPP-19068 above 1 shows a higher binding activity to inactive Sema3A.

The binding analysis as shown in Table 7a clearly showed that the antibody of the present disclosure (TPP-23298) shows increased binding to active Sema3A than TPP-30788-TPP-30791 (BI clones) presumably since they target a different epitope indicating a higher selectivity for active Sema3A.

Example 9: In Vitro Efficacy in a Mesangial Cell Migration Assay

A confluent monolayer of human primary mesangial cells was generated by seeding cells in serum-containing culture medium into image lock plates for 24 hours. After switching to serum-free culture medium, scratch wounds were created using the WoundMaker tool, after which the cells were treated with 1 nM recombinant human Sema3A-Fc chimera (R&D Systems) in the absence or presence of inhibitory antibodies. The cells were imaged in the Incucyte and after 24 hrs the extent of wound closure was assessed using the Incucyte Integrated Cell Migration Analysis software module.

TABLE 8

Antibody	EC50 values for phage display hits and recombination variants in the MCM assay
	EC50 [nM]
TPP-15051 (Chiome)	42.87
TPP-15354	31.87
TPP-15355	>200
TPP-15356	>200
TPP-15357	158.13
TPP-15358	>200
TPP-15359	>200

TABLE 8-continued

Antibody	EC50 [nM]
TPP-15360	37.47
TPP-15361	118.67
TPP-15362	>200
TPP-15363	>200
TPP-15364	>200
TPP-15365	>200
TPP-15366	2.27
TPP-15367	148.07
TPP-15368	>200
TPP-15369	45.47
TPP-15370	4.13
TPP-15371	>200
TPP-15372	86.87
TPP-15373	123.53
TPP-15374	5.07
TPP-15375	>200
TPP-15376	>200
TPP-15377	>200
TPP-15378	67.00
TPP-15379	>200
TPP-15380	125.53
TPP-15381	>200
TPP-15382	199.87
TPP-15384	1.60
TPP-15385	1.20
TPP-15386	>200
TPP-15387	>200
TPP-15388	>200
TPP-15389	103.60
TPP-15390	>200
TPP-15391	>200
TPP-15392	62.53
TPP-15393	131.93
TPP-15394	>200
TPP-15395	>200
TPP-15396	82.67
TPP-15397	>200
TPP-15398	6.00
TPP-15399	197.13
TPP-15400	4.73
TPP-15401	>200
TPP-17755 (Samsung)	11.33
TPP-23298	0.40
TPP-23334	0.67
TPP-23337	0.33
TPP-23338	0.60
TPP-23340	0.87
TPP-23341	0.90
TPP-23345	0.93
TPP-23346	1.27
TPP-23347	0.67
TPP-23373	0.63
TPP-23374	0.30
TPP-23375	1.03
TPP-30788 (BI clone I)	1.43

We identified antibodies with potencies in the three-digit picomolar range in the human Mesangial Cell Migration Assay, which is considerably more potent than the prior art antibodies, as shown in Table 8.

Example 10: In Vitro Efficacy in a Growth Cone Collapse Assay

In the direction of determining the potency of the antibodies against Sema3A induced cytoskeletal collapse, a growth cone collapse assay was used similarly as described (PMID: 12077190) with a few modifications. In brief, mouse dorsal root ganglion (DRG) neurons were isolated from E13 C57B1/6J mouse embryos, cultured on poly-L-lysine and laminin-coated 96-wells with Neurobasal medium+100 ng/ml NGF+B-27+10% FCS. After 20 hours,

the cells were treated for 1 hour with 10 nM recombinant human Sema3A-Fc chimera (RnD Systems) in the absence or presence of inhibitory antibodies followed by PFA fixation and staining with Alexa488-phalloidin. The extent of growth cone collapse was assessed using immunofluorescence microscopy via actin growth cone area/shape/texture for more than 100 growth cones per well.

TABLE 9

Antibody	EC50 (nM)
TPP-15051 (Chiome)	243.40
TPP-15354	67.73
TPP-15355	>200
TPP-15356	>200
TPP-15357	50.73
TPP-15358	>200
TPP-15359	>200
TPP-15360	31.07
TPP-15361	>200
TPP-15362	>200
TPP-15363	>200
TPP-15364	>200
TPP-15365	142.87
TPP-15366	4.13
TPP-15367	170.87
TPP-15368	>200
TPP-15369	76.60
TPP-15370	4.33
TPP-15371	>200
TPP-15372	109.47
TPP-15373	>200
TPP-15374	8.13
TPP-15375	>200
TPP-15376	>200
TPP-15377	>200
TPP-15378	138.60
TPP-15379	>200
TPP-15380	135.40
TPP-15381	>200
TPP-15382	>200
TPP-15384	18.80
TPP-15385	6.00
TPP-15386	>200
TPP-15387	>200
TPP-15388	>200
TPP-15389	160.67
TPP-15390	>200
TPP-15391	>200
TPP-15392	>200
TPP-15393	>200
TPP-15394	>200
TPP-15395	66.47
TPP-15396	180.80
TPP-15397	>200
TPP-15398	12.00
TPP-15399	>200
TPP-15400	25.73
TPP-15401	>200
TPP-17755 (Samsung)	52.67
TPP-23298	2.40
TPP-23334	2.24
TPP-23337	2.12
TPP-23374	2.19

The identified antibodies also show potencies in the single digit nanomolar range in the murine Growth Cone Collapse Assay, again considerably more potent than the tested prior art antibodies (two- to three-digit nanomolar potency), as shown in Table 9.

Example 11: In Vitro Efficacy in a HUVEC
Repulsion Assay

Recombinant human Sema3A-Fc chimera (R&D Systems) is not identical to Sema3A in human biofluids because it contains several mutated amino acids and an extra protein fragment at its carboxy-terminus. Furthermore, the above described assays (human Mesangial Cell Migration Assay and murine Growth Cone Collapse Assay) use Sema3A in homogenous distribution, which is in contrast to the gradient distribution described for Sema3A in tissues. We hypothesized that these differences could result in a different potency of the antibodies towards recombinant versus endogenous protein. Therefore, we adapted an assay using a gradient of human wild-type Sema3A as agonist (PMID: 17569671). In brief, in this HUVEC repulsion assay, human embryonic kidney 293 cells (HEK293) cells expressing human Sema3A of the sequence of SEQ ID NO: 600, were seeded on a confluent monolayer of human umbilical vein endothelial cells (HUVEC) in EGM-2 medium in the absence or presence of inhibitory antibodies, cultured for 72 hours, fixed, stained with DAPI and the extent of cell repulsion assessed by immunofluorescence microscopy (measurement of cell free areas). Consequently, the substrate human Sema3A exists in excess.

Based on immunofluorescence microscopy images of the DAPI/CM stained cells (CM=HCS CellMask™ Stain, stains the whole cell in order to define the total cell area) data analysis is performed as follows: Cells are identified based on the DAPI/CM signals (FIG. 11B). The cell area for analysis is defined and selected. In this area the cell-free region is calculated (FIG. 11C). Percent inhibition is calculated based on the “cell free-region” that is induced by Sema3A in the antibody-treated wells in comparison to the isotype-treated wells. Percent inhibition is plotted over antibody concentration and EC-50 values of the respective antibodies are calculated.

In detail the following steps are performed for the data analysis:

1. Four fields are imaged per well which corresponds to 80% of the well area. All of these fields stitched together are used for the detection of the cells via the DAPI/CM fluorescence.
2. The “cell area” is calculated based on the DAPI/CM area.
3. The “cell-free region” is calculated based on the “total area” subtracted by the “cell area”.
4. Percent inhibition is calculated based on the “cell free-region” that is induced by Sema3A in the antibody-treated wells vs the isotype-treated wells.
5. The software GraphPad Prism is used to determine the EC50 values using nonlinear regression (Variable slope model=four-parameter dose-response curve).

TABLE 10

EC50 values for selected antibodies in the repulsion assay, first experiment

Antibody	EC50 (pM)
TPP-15370	800
TPP-23298	80
TPP-23334	120
TPP-23337	170
TPP-23340	180
TPP-23341	113
TPP-23373	180

TABLE 10-continued

EC50 values for selected antibodies in the repulsion assay, first experiment		
	Antibody	EC50 (pM)
5	TPP-23374	77
	TPP-23375	123

TABLE 10a

EC50 values for TPP-23298 in the repulsion assay in a second experiment to compare to prior art antibodies		
	Antibody	EC50 (pM)
10	TPP-23298	54
15	TPP-30788 (BI clone I)	104
20	TPP-30789 (BI clone II)	165
25	TPP-30790 (BI clone III)	121
30	TPP-30791 (BI clone IV)	221
35	TPP-17755 (Samsung)	2794
	TPP-11489 (Chiome)	>20000

The potency distinction to the prior art antibodies in the human Mesangial Cell Migration Assay and murine Growth Cone Collapse Assay above, is even more pronounced in this HUVEC Repulsion Assay that uses a gradient of native wt Sema3A (mixture of processed inactive and undigested active Sema3A) as shown in Table 10 and 10a. The improved potency in HUVEC repulsion assay in comparison to TPP-17755, to TPP-11489, to TPP-30788, to TPP-30789, TPP-30790, or to TPP-30791 is quantified measuring the picomolar activity as shown by the corresponding EC-50 values. While TPP-23298 shows two-digit picomolar activities, prior art antibody potencies of TPP-17755, TPP-11489, TPP-30788, TPP-30789, TPP-30790, or TPP-30791, are in the three-digit picomolar or even nanomolar range.

As an alternative illustration of the results, the improved potency in HUVEC repulsion assay is quantified by measuring the cell-free region at a specified concentration of 80 pM of the respective antibodies. TPP-23298 shows a higher percent inhibition of Sema3A than to TPP-30788, to TPP-30789, TPP-30790, or to TPP-30791 (FIG. 12).

Analyzing the data from both assays displayed in table 10 and 10a TPP-23298 shows the highest potency against cellular Sema3A induced HUVEC repulsion. The BI Antibodies TPP-30788, TPP-30789, TPP-30790 and TPP-30791 exhibited slightly higher EC50 values (2-5-fold). The Samsung Antibody TPP-17755 has a significantly lower potency than the TPP-23298 (50-fold). The Chiome Antibody TPP-11489 did only show inhibitory activity at the highest tested concentrations resulting in a predicted EC50 value >400-fold above antibody according to the present disclosure.

That shows that under conditions, that resembles a native environment without any spiked exogenous, recombinant semaphorin3A, the antibodies according to the present disclosure inhibit Sema3A-induced cell repulsion with the strongest activity, as shown in Table 10 and 10a.

Example 12: In Vivo Assay for Detecting Protective Renal Effects: Inhibition of Sema3a-Induced Albuminuria in Mice

Sema3A inhibitors decrease urinary albumin excretion induced via systemic injection of recombinant Sema3A. The beneficial effect of the compounds on albuminuria reduction were investigated in a Sema3A-induced albuminuria model as follows:

Male C57B1/6 mice (8- to 10-wk-old) purchased from Taconic were injected intravenously with anti-Sema3A antibodies. Thirty minutes after antibody application albuminuria was induced by intravenous injection of human recombinant Sema3A (1.0 mg/kg, R&D Systems). Animals were placed into metabolic cages and urine was collected for 4 h. Urinary creatinine was measured via clinical biochemistry analyzer (Pentra400). For the assessment of urinary albumin, a mouse specific Albumin ELISA (Abcam) was used according to manufacturer's protocol. Both urinary creatinine and albumin were used to calculate urinary albumin to creatine ratio (ACR). Differences between groups were analyzed by one-way ANOVA with Dunnett's corrections for multiple comparisons. Statistical significance is defined as p<0.05. All statistical analyses were done using GraphPad Prism 8.

Table 11-15a show dose-response experiments with TPP-15370, TPP-15374, TPP-11489, TPP-17755, TPP-30788 and TPP-23298 in the Sema3A-induced albuminuria model in mice. Effects on albuminuria reduction with TPP-15370, TPP-23298 in comparison to TPP-11489 and/or TPP-17755 and/or TPP-30788 are shown in FIGS. 1A-2C.

The antibodies according to the present disclosure reduce Sema3A-induced urinary Albumin excretion.

TABLE 11

Dose-response of Sema3A-induced albuminuria reduction after treatment with TPP-15370	
	urinary albumin to creatinine ratio [µg/mg]
control; Mean ± SD	345.30 ± 102.15****
15 [mg/kg] isotype control; Mean ± SD	1392.80 ± 350.70
1 [mg/kg] TPP-15370; Mean ± SD	1030.80 ± 216.27**
5 [mg/kg] TPP-15370; Mean ± SD	693.84 ± 203.18****
15 [mg/kg] TPP-15370; Mean ± SD	273.10 ± 146.02****

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,
*/**/***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 12

Dose-response of Sema3A-induced albuminuria reduction after treatment with TPP-15374	
	urinary albumin to creatinine ratio [µg/mg]
Control; Mean ± SD	226.40 ± 65.50****
15 [mg/kg] isotype control; Mean ± SD	1061.43 ± 216.47
1 [mg/kg] TPP-15374; Mean ± SD	782.60 ± 122.43**
5 [mg/kg] TPP-15374; Mean ± SD	690.19 ± 190.27****
15 [mg/kg] TPP-15374; Mean ± SD	592.87 ± 123.93****

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,
*/**/***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 13

Dose-response of Sema3A-induced albuminuria reduction after treatment with TPP-23298	
	urinary albumin to creatinine ratio [µg/mg]
Control; Mean ± SD	345.30 ± 102.15****
15 [mg/kg] isotype control; Mean ± SD	1281.65 ± 447.14
1 [mg/kg] TPP-23298; Mean ± SD	623.37 ± 240.41****

TABLE 13-continued

Dose-response of Sema3A-induced albuminuria reduction after treatment with TPP-23298	
	urinary albumin to creatinine ratio [µg/mg]
5 [mg/kg] TPP-23298; Mean ± SD	471.07 ± 164.97****
15 [mg/kg] TPP-23298; Mean ± SD	320.60 ++± 166.36****

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,
*/**/***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 14

Dose-response of Sema3A-induced albuminuria reduction after treatment with TPP-11489	
	urinary albumin to creatinine ratio [µg/mg]
Control; Mean ± SD	237.23 ± 92.61****
15 [mg/kg] isotype control; Mean ± SD	1404.81 ± 411.55
1 [mg/kg] TPP-11489; Mean ± SD	1204.81 ± 426.64
5 [mg/kg] TPP-11489; Mean ± SD	664.02 ± 228.96****
15 [mg/kg] TPP-11489; Mean ± SD	572.42 ± 211.05****

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,
*/**/***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 15

Dose-response of Sema3A-induced albuminuria reduction after treatment with TPP-17755	
	urinary albumin to creatinine ratio [µg/mg]
Control; Mean ± SD	298.02 ± 91.06****
15 [mg/kg] isotype control; Mean ± SD	1053.75 ± 162.28
1 [mg/kg] TPP-17755; Mean ± SD	932.57 ± 221.09
5 [mg/kg] TPP-17755; Mean ± SD	823.11 ± 196.93*
15 [mg/kg] TPP-17755; Mean ± SD	711.09 ± 181.65***

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,
*/**/***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 15a

Dose-response of Sema3A-induced albuminuria reduction after treatment with TPP-30788	
	urinary albumin to creatinine ratio [µg/mg]
Control; Mean ± SD	266.67 ± 115.66****
15 [mg/kg] isotype control; Mean ± SD	1546.59 ± 312.43
1 [mg/kg] TPP-30788; Mean ± SD	1234.13 ± 353.48
5 [mg/kg] TPP-30788; Mean ± SD	958.30 ± 196.93**
15 [mg/kg] TPP-30788; Mean ± SD	841.46 ± 438.51****

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,
*/**/***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

Example 13: In Vivo Assay for Detecting Protective Renal Effects: Acute Ischemia/Reperfusion Injury (I/R) Model in Mice

Unilaterally nephrectomized mice may benefit from treatment with Sema3A inhibitors after ischemia reperfusion injury. The beneficial effect of Sema3A antibodies on kidney function was investigated in a kidney ischemia-reperfusion injury model in mice as follows:

Laboratory bred male C57B1/6J mice 6-8 weeks old were obtained from Charles River. Mice were maintained under standard laboratory conditions, 12-hour light-dark cycles with access to normal chow and drinking water at libitum. For the ischemia reperfusion injury model, a total of 8-10 was used in each control and experimental group.

Animals were anesthetized with continuous inhaled isoflurane. Right nephrectomy was performed through a right flank incision 7 days before the ischemic procedures in the contralateral kidneys. One-hour before the initiation of renal ischemia antibodies and adequate isotype control were administrated to mice via i.v. injection. Mice were anesthetized and a left flank incision was made. Renal vessels were exposed by dissection of the left renal pedicle. Non-traumatic vascular clamps were used to stop blood flow (artery and vein) during 25 min (mice) of ischemia. Reperfusion was established by removing the clamps. The abdominal wall (muscular layer and skin) was closed with 5.0 polypropylene sutures. Temgesic® (Buprenorphin, 0.025 mg/kg s.c.) was applied as an analgesic.

Urine of each animal was collected in metabolic cages over night before sacrifice at 24 h post ischemia. Urinary creatinine was measured by a clinical biochemistry analyzer (Pentra400). For the assessment of urinary albumin, a mouse specific Albumin Kit (Hitachi) was used within the Pentra analyzer. Both urinary creatinine and albumin were used to determine Albuminuria (albumin/creatinine ratio). Upon sacrifice, blood samples were obtained under terminal anesthesia. After centrifugation of the blood samples, serum was isolated. Both serum creatinine and serum urea were measured via clinical biochemistry analyzer (Pentra 400). Differences between groups were analyzed by one-way ANOVA with Dunnett's corrections for multiple comparisons. Statistical significance is defined as $p < 0.05$. All statistical analyses were done using GraphPad Prism 8.

Table 16-20 show dose-response experiments with TPP-15370, TPP-15374, TPP-11489, TPP-17755 and TPP-23298 in an acute renal ischemia/reperfusion injury model in mice. FIGS. 3A-3C show the efficacy of TPP-23374, TPP-23298 and TPP-15370 after treatment with 15 mg/kg in the I/R model. Treatment effects with TPP-15370, TPP-23298 and TPP-15374 in comparison to TPP-11489 and/or TPP-17755 are shown in FIGS. 4A-6C.

The antibodies attenuated ischemia/reperfusion induced kidney damage by reducing serum creatinine and serum urea (surrogates for glomerular filtration rate) and excretion of urinary albumin.

TABLE 16

Dose-response of TPP-15370 in mouse I/R injury model			
	serum creatinine [mg/dl]	serum urea [mg/dl]	urinary albumin to creatinine ratio [µg/mg]
SHAM	0.34 ± 0.05****	102.78 ± 9.45****	58.50 ± 19.22****
Mean ± SD			
15 [mg/kg]	1.72 ± 0.30	385.63 ± 41.69	1699.47 ± 461.60
isotype control			
Mean ± SD			
1 [mg/kg]	1.61 ± 0.52	396.51 ± 86.91	1165.37 ± 445.50**
TPP-15370			
Mean ± SD			
5 [mg/kg]	1.22 ± 0.32*	297.92 ± 70.02**	705.21 ± 192.26**
TPP-15370			
Mean ± SD			

TABLE 16-continued

Dose-response of TPP-15370 in mouse I/R injury model			
	serum creatinine [mg/dl]	serum urea [mg/dl]	urinary albumin to creatinine ratio [µg/mg]
15 [mg/kg]	0.89 ± 0.27****	261.95 ± 27.76***	554.52 ± 133.99****
TPP-15370			
Mean ± SD			

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,

****= significant with $p < 0.05/0.01/0.001/0.0001$ vs isotype control

TABLE 17

Dose-response of TPP-15374 in mouse I/R injury model			
	serum creatinine [mg/dl]	serum urea [mg/dl]	urinary albumin to creatinine ratio [µg/mg]
SHAM	0.26 ± 0.02****	113.90 ± 29.95****	39.36 ± 10.19****
Mean ± SD			
15 [mg/kg]	2.09 ± 0.19	494.52 ± 29.75	3942.50 ± 1790.29
isotype control			
Mean ± SD			
1 [mg/kg]	1.84 ± 0.39	478.10 ± 66.55	2774.43 ± 946.18
TPP-15374			
Mean ± SD			
5 [mg/kg]	1.66 ± 0.32*	416.49 ± 98.47*	2195.95 ± 900.56*
TPP-15374			
Mean ± SD			
15 [mg/kg]	1.43 ± 0.34****	389.02 ± 512.8**	1495.88 ± 560.06**
TPP-15374			
Mean ± SD			

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,

****= significant with $p < 0.05/0.01/0.001/0.0001$ vs isotype control

TABLE 18

Dose-response of TPP-11489 in mouse I/R injury model			
	serum creatinine [mg/dl]	serum urea [mg/dl]	urinary albumin to creatinine ratio [µg/mg]
SHAM	0.22 ± 0.02****	57.64 ± 14.62****	27.87 ± 13.55****
Mean ± SD			
15 [mg/kg]	1.99 ± 0.29	410.18 ± 39.80	1569.47 ± 277.70
isotype control			
Mean ± SD			
1 [mg/kg]	2.00 ± 0.12	453.84 ± 26.54	1600.96 ± 338.48
TPP-11489			
Mean ± SD			
5 [mg/kg]	1.92 ± 0.16	416.87 ± 49.81	1437.08 ± 323.46
TPP-11489			
Mean ± SD			
15 [mg/kg]	1.68 ± 0.42*	367.67 ± 39.32	1186.32 ± 366.49*
TPP-11489			
Mean ± SD			

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons,

****= significant with $p < 0.05/0.01/0.001/0.0001$ vs isotype control

TABLE 19

	serum creatinine [mg/dl]	serum urea [mg/dl]	urinary albumin to creatinine ratio [μg/mg]
SHAM	0.21 ± 0.06****	91.20 ± 34.20****	75.45 ± 42.78****
Mean ± SD	15 [mg/kg]	1.75 ± 0.30	444.25 ± 64.25
isotype control			1791.23 ± 543.46
Mean ± SD	1 [mg/kg]	1.74 ± 0.27	430.30 ± 75.96
TPP-17755			1659.08 ± 577.99
Mean ± SD	5 [mg/kg]	1.84 ± 0.24	439.83 ± 73.68
TPP-17755			1661.14 ± 460.41
Mean ± SD	15 [mg/kg]	1.31 ± 0.37**	346.62 ± 78.14**
TPP-17755			1351.64 ± 795.59
Mean ± SD			

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons.
*/**/***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 20

	serum creatinine [mg/dl]	serum urea [mg/dl]	urinary albumin to creatinine ratio [μg/mg]
SHAM	0.26 ± 0.04****	115.80 ± 6.76****	71.05 ± 865.39****
Mean ± SD	15 [mg/kg]	2.53 ± 0.15	498.92 ± 45.45
isotype control			3968.71 ± 453.52
Mean ± SD	1 [mg/kg]	2.38 ± 0.22	482.06 ± 25.84
TPP-23298			2383.77 ± 1111.94**
Mean ± SD	5 [mg/kg]	2.20 ± 0.36*	425.64 ± 58.85*
TPP-23298			1966.11 ± 677.69****
Mean ± SD	15 [mg/kg]	2.02 ± 0.28***	422.79 ± 71.44**
TPP-23298			1949.56 ± 700.58****
Mean ± SD			

8-10 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons. One-way ANOVA with Dunnett's corrections for multiple comparisons, */**/***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

Example 14: In Vivo Assay for Detecting Protective Renal Effects: Alport Syndrome Model (Col4α3 Deficient Mice)

The phenotype of Alport mice is similar to that of Alport patients, including characteristic thickening and splitting of the glomerular basement membrane as well as strong proteinuria. Alport mice may benefit from treatment with Sema3A inhibitors due to increased Sema3A expression in kidneys of those mice. The beneficial effect of Sema3A blocking antibodies on kidney function was investigated in the Alport mouse model as follows: A colony of knockout Col4α3 (129-Col4α3<tm1Dec>/J) mice (Jackson Laboratory, USA) was established by mating heterozygous animals within the breeding facilities at Bayer A G, Wuppertal, Germany. Male and female homozygous and wild-type Col4α3 mice at an age of 4-5 weeks were obtained from the animal breeding facilities at Bayer A G and used for this study.

The homozygous mice (HOM) were randomized into groups (n=10 each group) according to their age and gender. Mice were dosed once weekly with isotype control and

TPP-15370 and TPP-23298. TPP-11489 was administered biweekly. Urine of each animal was collected in metabolic cages once weekly starting before initiation of treatment. Urinary creatinine as well as total protein was measured by a clinical biochemistry analyzer (Pentra400). Both urinary creatinine and albumin were used to determine proteinuria (protein/creatinine ratio). Upon sacrifice at day 21 or day 28 post treatment start, blood samples were obtained under terminal anesthesia. After centrifugation of the blood samples, serum was isolated. Both serum creatinine and serum urea were measured via clinical biochemistry analyzer (Pentra 400).

Kidneys were collected and divided in two parts. One part was snap-frozen in liquid nitrogen for mRNA analysis. The other part was stored in Davidson's fixative for the preparation of histological sections. Total RNA was isolated from parts of harvested kidneys. Kidney tissue was homogenized, and RNA was obtained and transcribed to cDNA. Using TaqMan real time PCR renal mRNA expression of profibrotic markers was analyzed in kidney tissues. For the assessment of fibrosis on the protein level paraffin tissue sections were stained with alpha-smooth muscle actin (αSMA) and Sirius Red/Fast Green Collagen staining using standard procedures.

Quantitative measurements of alpha-smooth muscle actin (αSMA)-positive as well as Sirius Red (Collagen) positive areas within the kidneys were obtained by computer image analysis using the Axio Scan Z1 (Zeiss) microscope and the Zen software.

All data are expressed as means±S.D. Differences between groups were analyzed by one-way ANOVA with Dunnett's corrections for multiple comparisons. Statistical significance was defined as p<0.05. All statistical analyses were done using GraphPad Prism 8.

Tables 21A-21C and 22A-22C show effects on proteinuria, kidney function and kidney fibrosis obtained after treatment with TPP-15370 and TPP-23298 in the Alport model. Effects after treatment with TPP-15370 in comparison to TPP-11489 on proteinuria, kidney function and kidney fibrosis are displayed in FIGS. 7 and 8A-8D.

The antibodies according to the present disclosure stopped the progression of kidney disease in a mouse model of Alport syndrome. The antibodies according to the present disclosure reduced the excretion of urinary protein, reduced creatinine and serum urea (surrogates for glomerular filtration rate) as well as fibrosis quantified via myofibroblasts staining and collagen deposition.

TABLE 21A

Effects of TPP-15370 on proteinuria progression in Alport mouse model				
urinary protein to creatinine ratio [%] increase from baseline				
	baseline	day 7	day 14	day 21
HOM	100.00 ± 53.71	118.65 ± 47.18	167.49 ± 55.77	192.03 ± 40.23
15 [mg/kg]				
isotype control				
Mean ± SD				
HOM	100.00 ± 54.02	114.61 ± 50.48	149.35 ± 95.41	164.92 ± 47.18
5 [mg/kg]				
TPP-15370				
Mean ± SD				

TABLE 21A-continued

Effects of TPP-15370 on proteinuria progression in Alport mouse model				
urinary protein to creatinine ratio [%] increase from baseline				
	baseline	day 7	day 14	day 21
HOM	100.00 ±	114.61 ±	95.41 ±	93.04 ±
15 [mg/kg]	65.59	50.48	52.50**	31.26****
TPP-15370				
Mean ± SD				

10 animal/group, data are expressed as relative means ± SD percentage values calculated vs. baseline (set to 100). Differences between groups were analyzed by one-way ANOVA with Dunnett's corrections for multiple comparisons. Statistical significance was defined as p ≤ 0.05.

TABLE 21B

Effects of TPP-15370 on functional parameters at day 21 in Alport mouse model		
	serum creatinine [mg/dl]	serum urea [mg/dl]
HOM	0.71 ± 0.26	380.61 ± 120.28
15 [mg/kg]		
isotype control		
Mean ± SD		
HOM	0.39 ± 0.16**	255.25 ± 56.80**
5 [mg/kg]		
TPP-15370		
Mean ± SD		
HOM	0.44 ± 0.21**	256.71 ± 95.03**
15 [mg/kg]		
TPP-15370		
Mean ± SD		

10-15 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons. One-way ANOVA with Dunnett's corrections for multiple comparisons, ***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 21C

Effects of TPP-15370 on fibrosis at day 28 in Alport mouse model		
	Myofibroblasts % αSMA reduction	Collagen % Sirius Red reduction
HOM	100.00 ± 53.53	100.00 ± 47.78
15 [mg/kg]		
isotype control		
Mean ± SD		
HOM	50.18 ± 21.00**	80.08 ± 51.58
5 [mg/kg]		
TPP-15370		
Mean ± SD		
HOM	54.86 ± 17.60**	100.26 ± 50.97
15 [mg/kg]		
TPP-15370		
Mean ± SD		

10-15 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons. One-way ANOVA with Dunnett's corrections for multiple comparisons, ***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 22A

Effects of TPP-23298 on proteinuria progression in Alport mouse model				
urinary protein to creatinine ratio [%] increase from baseline				
	baseline	day 14	day 21	day 28
10 HOM	100.00 ±	185.29 ±	228.62 ±	283.62 ±
15 [mg/kg]	70.94	88.09	160.68	77.37
isotype control				
Mean ± SD				
15 HOM	100.00 ±	148.01 ±	155.25 ±	151.82 ±
5 [mg/kg]	55.72	77.13	61.60	45.84****
TPP-23298				
Mean ± SD				
20 HOM	100.00 ±	154.58 ±	120.54 ±	125.71 ±
15 [mg/kg]	56.02	91.21	37.21****	34.25****
TPP-23298				
Mean ± SD				

10 animal/group, data are expressed as relative means ± SD percentage values calculated vs. baseline (set to 100). Differences between groups were analyzed by one-way ANOVA with Dunnnett's corrections for multiple comparisons. Statistical significance was defined as p ≤ 0.05.

TABLE 22B

Effects of TPP-23298 on functional parameters at day 28 in Alport mouse model		
	serum creatinine [mg/dl]	serum urea [mg/dl]
30 HOM	0.29 ± 0.07	208.89 ± 0.07
15 [mg/kg]		
isotype control		
Mean ± SD		
35 HOM	0.22 ± 0.09*	175.54 ± 0.03
5 [mg/kg]		
TPP-23298		
Mean ± SD		
40 HOM	0.19 ± 0.03***	141.84 ± 0.03***
15 [mg/kg]		
TPP-23298		
Mean ± SD		

10-15 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons. One-way ANOVA with Dunnett's corrections for multiple comparisons, ***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

TABLE 22C

Effects of TPP-23298 on fibrosis at day 28 in Alport mouse model		
	Myofibroblasts % αSMA positive area	Collagen % Sirius Red positive area
50 HOM	100.00 ± 53.53	100.00 ± 47.78
15 [mg/kg]		
isotype control		
Mean ± SD		
55 HOM	50.18 ± 21.00**	80.08 ± 51.58
5 [mg/kg]		
TPP-23298		
Mean ± SD		
60 HOM	54.86 ± 17.60**	100.26 ± 50.97
15 [mg/kg]		
TPP-23298		
Mean ± SD		

10-15 animal/group, One-way ANOVA with Dunnett's corrections for multiple comparisons. One-way ANOVA with Dunnett's corrections for multiple comparisons, ***/****= significant with p < 0.05/0.01/0.001/0.0001 vs isotype control

Example 15: In Vivo Away for Detecting Protective Renal Effects: Unilateral Kidney IRI Model in Pig

TPP-23298 was tested in a minimal invasive, unilateral kidney artery balloon-catheter occlusion model in adult minipigs with a post-reperfusion follow-up of about 24 hours. Female Göttingen mini pigs of a body weight range 14 to 17 kg (Ellegaard, Denmark) were used for the experiments. Animals were randomly assigned to experimental groups.

TPP-23298 was administered in a blinded, controlled study to 6 animals in comparison to 6 matched IgG-treated controls. Animals which were subjected to all treatment procedures without kidney artery occlusion and received phosphate buffered saline vehicle only served as sham treated reference group.

TPP-23298 was administered at weight adjusted doses in a final volume of 1 ml/kg phosphate buffered saline as a bolus by slow intravenous injection before start of kidney artery occlusion (preventive setting).

For the intervention on day 1 of experimentation pigs were anesthetized by a combination of Propofol and Fentanyl and artificially ventilated over an oro-tracheal tube under muscular relaxation by Pancuronium. Volume was continuously substituted by continuous infusion of Ringer lactate solution. Before starting surgery, antibiotic and thrombosis prophylaxis were provided by administration of Enrofloxacin i.m. and Heparin i.v., respectively. Blood pressure and heart rate were monitored with a non-invasive veterinary device equipped with a foreleg cuff.

All following interventions were performed under strictly aseptic conditions. A catheter was tunneled subcutaneously through the dorsal neck skin to a jugular vein for drug administration. A sheath was placed into the—preferably left—femoral artery and fixed, through which a hockey-stick catheter with a balloon catheter inside was advanced upstream into the abdominal aorta and inserted with its tip into the orifice of the left or right kidney artery. The balloon catheter was then protruded, and the balloon was inflated to interrupt blood flow to the kidney. Correct positioning of the balloon was controlled by Doppler ultrasound using a commercial ultrasound diagnostic apparatus. Plasma samples were collected at baseline and 2 h after start of ischemia.

Kidney ischemia was relieved exactly at pre-defined time points after start of occlusion (ranging from 90 to 120 min) by deflating the balloon and withdrawing the catheter and the sheath. After vascular suture and wound closure animals were re-awakened from anesthesia and after onset of spontaneous breathing extubated.

About 22 to 23 hours after the kidney artery occlusion animals were re-anesthetized by a combination of Ketaset/Dormicum and Pancuronium and artificially ventilated as described. Blood pressure and heart rate were invasively monitored via a carotid artery catheter. Volume substitution was provided at a flow rate of 10 ml/kg/h Ringer Lactate intravenously. Via a small incision in the lower abdomen both ureters were dissected on the urinary bladder wall and catheters were inserted to collect urine side separately for volume determination and urinalysis. Recordings and sample collections were started when all parameters were stable, which was typically the case 24 hours after occlusion. Blood samples were collected at baseline and every hour for three hours (24-27 h interval). In parallel urine was collected for three intervals of 1 h.

After urine volume flow (V_U) and urinary creatinine concentrations ($[Crea]_U$) were determined creatinine clearance (CL_{Crea}) was calculated side separately according to

the standard formula $CL_{Crea} = V_U * [Crea]_U / [Crea]_{Pl}$ in which $[Crea]_{Pl}$ stands for plasma creatinine concentration. Global CL_{Crea} was calculated by adding CL_{Crea} of left and right kidney of each animal.

The results are depicted in FIGS. 9A-9D. TPP-23298 when administered in a preventive manner 30 min before occlusion prevented deterioration of ischemia/reperfusion-induced creatinine clearance significantly in this experimental setting after a unilateral kidney artery occlusion of 105 min.

Example 16: Expression Titer of Anti-Sema3A Antibodies in Mammalian Cell Culture

HEK293-6E cells were transfected with pTT5 plasmids coding for the heavy and light chain of anti-Sema3A antibodies or with the Fab fragment of TPP-30792 (TPP-31357). Two days prior to transfection, HEK293-6E cells were split to a density of 5×10^5 cells/mL in FreeStyleTM F17 Expression Medium (Gibco, A1383501) with 0.1% Pluronic F68 (Gibco, 24040032) and 4 mM GlutaMax (Gibco, 35050061) in a shake flask, making up 90% of the desired expression volume. HEK293-6E cells were cultivated at 37° C., 5% CO₂ shaking at 75 rpm.

For transfection, the DNA and polyethylenimine (Polysciences, 29366) are mixed in FreeStyleTM F17 Expression Medium (Gibco, A1383501) with 4 mM GlutaMax (Gibco, 35050061) making up 10% of the final expression volume. The solution is incubated for 10 minutes and added to the shake flask.

24 hours after transfection, 1% (v/v) ultra-low IgG FBS (Gibco, 16250078) and 0.05% (v/v) 1N valproic acid (Sigma, P4543) are added to the shake flask.

The cell viability and density are monitored every day starting 4 days post transfection, the supernatant is harvested by centrifugation and sterile filtration when the viability is determined to be 70%. To determine the production titer, 100 µL of the harvested supernatant are loaded to a 0.1 mL Poros A affinity column (Thermo Scientific, 2100100) via HPLC-system (Agilent, 1100 HPLC system) using 50 mM sodium phosphate (Sigma, S0751, S9763), 150 mM NaCl (Sigma, S6546), 5% 2-propanol (sigma, 34863), pH 7.2 as running buffer. Subsequently, the protein is eluted using 12 mM HCl (Sigma, H9892), 150 mM NaCl, 5% 2-propanol pH 2. A calibration curve from 5 µg/mL to 150 µg/mL is set up using a protein of known size and is applied to the Poros A column via HPLC-system as well. Taking the size and extinction coefficient of the protein in the supernatant into consideration, the exact titer can be calculated using the standard curve. Expression in CHO is similar to HEK cells except that plasmid pTT22AKT was used for TPP-30792.

TABLE 23

Expression Titer of anti-Sema3A antibodies in mammalian cells in mg/L	
	Titer [mg/L]
TPP-23298	203.6
TPP-17755 (Samsung)	277.0
TPP-11489 (Chiome)	132.0
TPP-30791 (BI clone IV)	333.0
TPP-30790 (BI clone III)	160.9
TPP-30789 (BI clone II)	187.6
TPP-30788 (BI clone I)	240.2
TPP-30792 (3H4 Univ Ramot)	3.0 (HEK), 3.2 (CHO)
TPP-31357 (Fab of TPP-30792)	Not determined

The antibody of the present disclosure as well as all prior art antibodies except TPP-30792 can be produced with high titers in mammalian cells, as shown in Table 23. TPP-30792 could not be expressed in a significant amount in either HEK or CHO cells. In total 125 µg of TPP-30792 could be purified out of 4.5 liters of HEK293 cell culture. Similarly, the Fab fragment of TPP30792 (TPP-31357) yielded only 200 µg purified Fab out of 5 liters HEK293 cell culture.

Example 17: Analysis of CMC Parameter Stability and Solubility of Anti-Sema3A Antibodies

It is known that high concentrated protein solutions of more than 50 mg/ml usually exhibit also higher viscosities compared to lower concentrated protein solutions. Increased viscosity negatively affects the deliverability of the protein solutions especially in low application volumes and it may increase the injection time and pain at the site of injection. In addition to that, high viscosity impacts high-scale protein production in the industry. Thus, reducing viscosity of high concentrated protein solutions while maintaining stability for a long shelf life is i.a. important for the therapeutical in vivo setting.

Proteins in high concentrated solutions are often less stable than in diluted solutions, since the proteins tend to aggregate and may reversibly self-associate at higher concentrations. Aggregation may negatively impact structural integrity and therefore also the amount of functional, bio-available protein in the therapeutical in vivo setting. This further complicates delivery by injection.

Solubility of proteins is another important quality criterion. Increased solubility of the isolated protein allows for the preparation of highly concentrated solutions required for the therapeutical in vivo setting.

Thus, providing a high concentrated protein solution with reduced viscosity and increased stability and solubility is beneficial for therapeutic applicability of therapeutic molecules.

To assess the CMC (Chemistry, Manufacturing, Control) parameters stability, solubility and viscosity of anti-Sema3A antibodies for potential therapeutic use, antibodies TPP-23289 and TPP-30788 (BI clone I) were diluted in PBS to 25 mg/ml and incubated at 700 rpm and 40° C. for two weeks. While antibodies are usually stored at 4°–10° C. for short-term or frozen at ≤−18° C. or ≥−81° C. for long term

an exposure of mammalian antibodies to temperatures higher than ≥40° C. (mammalian average body temperature is 36° C.-39° C.) resembles a thermal stress condition. In this thermal stress condition accelerated protein stability/stress 5 stability is tested. Analysis of stability was assessed by size-exclusion chromatography using a Superdex 200 column (Cytiva) coupled to an Åkta system (Cytiva) in PBS buffer as well as capillary gel electrophoresis using a Caliper system (Perkin Elmer). Changes in profile were calculated 10 as percentage to non-stressed starting material. Solubility was determined by concentrating anti-Sema3A antibodies using an Amicon spin filter (Millipore) with a cut-off of 30 kDa in PBS buffer. The solubility was determined at 90% recovery from the concentrator and protein concentration 15 was measured using Absorption at UV280 nm.

TABLE 24

Overview of CMC parameters for TPP-23289 and TPP-30788; SEC = size-exclusion chromatography, cGE = capillary gel electrophoresis				
CMC Parameter	Method	Analysis	TPP-23289	TPP-30788 (BI clone I)
Stability at 40° C.	SEC* cGE**	Δ % monomer Δ % LC ± HC	1 <1	-5.5 -4.7
Solubility	concentrator	mg/ml at 90% recovery	225	105
Viscosity	SEC* Viscosizer	Δ % monomer cP	<1 5.1 (150 mg/ml)	<1 5.3 (127 mg/ml)

*SEC = Size exclusion chromatography;

**cGE = capillary gel electrophoresis

Stability, solubility and viscosity are critical CMC parameters for therapeutic molecules as described above. The structural integrity after a thermal stress condition, like exposure to 40° C., or concentrating step is analyzed via SEC and/or cGE to see the effect of the applied stress on the structural integrity. Less than 1% change after the applied stress compared to the start points to a stable molecule whereas deviations >1% points to instabilities in the molecule. TPP-23289 shows a much higher solubility in PBS compared to TPP-30788 by a factor >2 which is very beneficial for e.g. enabling low application volume. Furthermore, TPP-23289 is more stable and more resistant to heat stress than TPP-30788 and is less viscous in PBS buffer.

TABLE 1

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).
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TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-11489	Chiome Prior Art (hIgG1)	VH	PRT	SEQ ID NO: 1
TPP-11489	Chiome Prior Art (hIgG1)	HCDR1	PRT	SEQ ID NO: 2
TPP-11489	Chiome Prior Art (hIgG1)	HCDR2	PRT	SEQ ID NO: 3
TPP-11489	Chiome Prior Art (hIgG1)	HCDR3	PRT	SEQ ID NO: 4
TPP-11489	Chiome Prior Art (hIgG1)	VL	PRT	SEQ ID NO: 5
TPP-11489	Chiome Prior Art (hIgG1)	LCDR1	PRT	SEQ ID NO: 6
TPP-11489	Chiome Prior Art (hIgG1)	LCDR2	PRT	SEQ ID NO: 7
TPP-11489	Chiome Prior Art (hIgG1)	LCDR3	PRT	SEQ ID NO: 8
TPP-11489	Chiome Prior Art (hIgG1)	VH	DNA	SEQ ID NO: 9
TPP-11489	Chiome Prior Art (hIgG1)	HCDR1	DNA	SEQ ID NO: 10
TPP-11489	Chiome Prior Art (hIgG1)	HCDR2	DNA	SEQ ID NO: 11
TPP-11489	Chiome Prior Art (hIgG1)	HCDR3	DNA	SEQ ID NO: 12
TPP-11489	Chiome Prior Art (hIgG1)	VL	DNA	SEQ ID NO: 13
TPP-11489	Chiome Prior Art (hIgG1)	LCDR1	DNA	SEQ ID NO: 14

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 respresents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-11489	Chiome Prior Art (hIgG1)	LCDR2	DNA	SEQ ID NO: 15
TPP-11489	Chiome Prior Art (hIgG1)	LCDR3	DNA	SEQ ID NO: 16
TPP-11489	Chiome Prior Art (hIgG1)	Heavy Chain	PRT	SEQ ID NO: 17
TPP-11489	Chiome Prior Art (hIgG1)	Light Chain	PRT	SEQ ID NO: 18
TPP-11489	Chiome Prior Art (hIgG1)	Heavy Chain	DNA	SEQ ID NO: 19
TPP-11489	Chiome Prior Art (hIgG1)	Light Chain	DNA	SEQ ID NO: 20
TPP-15051	Chiome Prior Art (mIgG1)	VH	PRT	SEQ ID NO: 21
TPP-15051	Chiome Prior Art (mIgG1)	HCDR1	PRT	SEQ ID NO: 22
TPP-15051	Chiome Prior Art (mIgG1)	HCDR2	PRT	SEQ ID NO: 23
TPP-15051	Chiome Prior Art (mIgG1)	HCDR3	PRT	SEQ ID NO: 24
TPP-15051	Chiome Prior Art (mIgG1)	VL	PRT	SEQ ID NO: 25
TPP-15051	Chiome Prior Art (mIgG1)	LCDR1	PRT	SEQ ID NO: 26
TPP-15051	Chiome Prior Art (mIgG1)	LCDR2	PRT	SEQ ID NO: 27
TPP-15051	Chiome Prior Art (mIgG1)	LCDR3	PRT	SEQ ID NO: 28
TPP-15051	Chiome Prior Art (mIgG1)	VH	DNA	SEQ ID NO: 29
TPP-15051	Chiome Prior Art (mIgG1)	HCDR1	DNA	SEQ ID NO: 30
TPP-15051	Chiome Prior Art (mIgG1)	HCDR2	DNA	SEQ ID NO: 31
TPP-15051	Chiome Prior Art (mIgG1)	HCDR3	DNA	SEQ ID NO: 32
TPP-15051	Chiome Prior Art (mIgG1)	VL	DNA	SEQ ID NO: 33
TPP-15051	Chiome Prior Art (mIgG1)	LCDR1	DNA	SEQ ID NO: 34
TPP-15051	Chiome Prior Art (mIgG1)	LCDR2	DNA	SEQ ID NO: 35
TPP-15051	Chiome Prior Art (mIgG1)	LCDR3	DNA	SEQ ID NO: 36
TPP-15051	Chiome Prior Art (mIgG1)	Heavy Chain	PRT	SEQ ID NO: 37
TPP-15051	Chiome Prior Art (mIgG1)	Light Chain	PRT	SEQ ID NO: 38
TPP-15051	Chiome Prior Art (mIgG1)	Heavy Chain	DNA	SEQ ID NO: 39
TPP-15051	Chiome Prior Art (mIgG1)	Light Chain	DNA	SEQ ID NO: 40
TPP-15370	IgG1, hit from panning	VH	PRT	SEQ ID NO: 41
TPP-15370	IgG1, hit from panning	HCDR1	PRT	SEQ ID NO: 42
TPP-15370	IgG1, hit from panning	HCDR2	PRT	SEQ ID NO: 43
TPP-15370	IgG1, hit from panning	HCDR3	PRT	SEQ ID NO: 44
TPP-15370	IgG1, hit from panning	VL	PRT	SEQ ID NO: 45
TPP-15370	IgG1, hit from panning	LCDR1	PRT	SEQ ID NO: 46
TPP-15370	IgG1, hit from panning	LCDR2	PRT	SEQ ID NO: 47
TPP-15370	IgG1, hit from panning	LCDR3	PRT	SEQ ID NO: 48
TPP-15370	IgG1, hit from panning	VH	DNA	SEQ ID NO: 49
TPP-15370	IgG1, hit from panning	HCDR1	DNA	SEQ ID NO: 50
TPP-15370	IgG1, hit from panning	HCDR2	DNA	SEQ ID NO: 51
TPP-15370	IgG1, hit from panning	HCDR3	DNA	SEQ ID NO: 52
TPP-15370	IgG1, hit from panning	VL	DNA	SEQ ID NO: 53
TPP-15370	IgG1, hit from panning	LCDR1	DNA	SEQ ID NO: 54
TPP-15370	IgG1, hit from panning	LCDR2	DNA	SEQ ID NO: 55
TPP-15370	IgG1, hit from panning	LCDR3	DNA	SEQ ID NO: 56
TPP-15370	IgG1, hit from panning	Heavy Chain	PRT	SEQ ID NO: 57
TPP-15370	IgG1, hit from panning	Light Chain	PRT	SEQ ID NO: 58
TPP-15370	IgG1, hit from panning	Heavy Chain	DNA	SEQ ID NO: 59
TPP-15370	IgG1, hit from panning	Light Chain	DNA	SEQ ID NO: 60
TPP-15374	IgG1, hit from panning	VH	PRT	SEQ ID NO: 61
TPP-15374	IgG1, hit from panning	HCDR1	PRT	SEQ ID NO: 62
TPP-15374	IgG1, hit from panning	HCDR2	PRT	SEQ ID NO: 63
TPP-15374	IgG1, hit from panning	HCDR3	PRT	SEQ ID NO: 64
TPP-15374	IgG1, hit from panning	VL	PRT	SEQ ID NO: 65
TPP-15374	IgG1, hit from panning	LCDR1	PRT	SEQ ID NO: 66
TPP-15374	IgG1, hit from panning	LCDR2	PRT	SEQ ID NO: 67
TPP-15374	IgG1, hit from panning	LCDR3	PRT	SEQ ID NO: 68
TPP-15374	IgG1, hit from panning	VH	DNA	SEQ ID NO: 69
TPP-15374	IgG1, hit from panning	HCDR1	DNA	SEQ ID NO: 70
TPP-15374	IgG1, hit from panning	HCDR2	DNA	SEQ ID NO: 71
TPP-15374	IgG1, hit from panning	HCDR3	DNA	SEQ ID NO: 72
TPP-15374	IgG1, hit from panning	VL	DNA	SEQ ID NO: 73
TPP-15374	IgG1, hit from panning	LCDR1	DNA	SEQ ID NO: 74
TPP-15374	IgG1, hit from panning	LCDR2	DNA	SEQ ID NO: 75
TPP-15374	IgG1, hit from panning	LCDR3	DNA	SEQ ID NO: 76
TPP-15374	IgG1, hit from panning	Heavy Chain	PRT	SEQ ID NO: 77
TPP-15374	IgG1, hit from panning	Light Chain	PRT	SEQ ID NO: 78
TPP-15374	IgG1, hit from panning	Heavy Chain	DNA	SEQ ID NO: 79
TPP-15374	IgG1, hit from panning	Light Chain	DNA	SEQ ID NO: 80
TPP-17755	Samsung Prior Art F11	VH	PRT	SEQ ID NO: 81
TPP-17755	Samsung Prior Art F11	HCDR1	PRT	SEQ ID NO: 82
TPP-17755	Samsung Prior Art F11	HCDR2	PRT	SEQ ID NO: 83
TPP-17755	Samsung Prior Art F11	HCDR3	PRT	SEQ ID NO: 84
TPP-17755	Samsung Prior Art F11	VL	PRT	SEQ ID NO: 85

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-17755	Samsung Prior Art F11	LCDR1	PRT	SEQ ID NO: 86
TPP-17755	Samsung Prior Art F11	LCDR2	PRT	SEQ ID NO: 87
TPP-17755	Samsung Prior Art F11	LCDR3	PRT	SEQ ID NO: 88
TPP-17755	Samsung Prior Art F11	VH	DNA	SEQ ID NO: 89
TPP-17755	Samsung Prior Art F11	HCDR1	DNA	SEQ ID NO: 90
TPP-17755	Samsung Prior Art F11	HCDR2	DNA	SEQ ID NO: 91
TPP-17755	Samsung Prior Art F11	HCDR3	DNA	SEQ ID NO: 92
TPP-17755	Samsung Prior Art F11	VL	DNA	SEQ ID NO: 93
TPP-17755	Samsung Prior Art F11	LCDR1	DNA	SEQ ID NO: 94
TPP-17755	Samsung Prior Art F11	LCDR2	DNA	SEQ ID NO: 95
TPP-17755	Samsung Prior Art F11	LCDR3	DNA	SEQ ID NO: 96
TPP-17755	Samsung Prior Art F11	Heavy Chain	PRT	SEQ ID NO: 97
TPP-17755	Samsung Prior Art F11	Light Chain	PRT	SEQ ID NO: 98
TPP-17755	Samsung Prior Art F11	Heavy Chain	DNA	SEQ ID NO: 99
TPP-17755	Samsung Prior Art F11	Light Chain	DNA	SEQ ID NO: 100
TPP-18533	germline IgG1 of TPP-15374	VH	PRT	SEQ ID NO: 101
TPP-18533	germline IgG1 of TPP-15374	HCDR1	PRT	SEQ ID NO: 102
TPP-18533	germline IgG1 of TPP-15374	HCDR2	PRT	SEQ ID NO: 103
TPP-18533	germline IgG1 of TPP-15374	HCDR3	PRT	SEQ ID NO: 104
TPP-18533	germline IgG1 of TPP-15374	VL	PRT	SEQ ID NO: 105
TPP-18533	germline IgG1 of TPP-15374	LCDR1	PRT	SEQ ID NO: 106
TPP-18533	germline IgG1 of TPP-15374	LCDR2	PRT	SEQ ID NO: 107
TPP-18533	germline IgG1 of TPP-15374	LCDR3	PRT	SEQ ID NO: 108
TPP-18533	germline IgG1 of TPP-15374	VH	DNA	SEQ ID NO: 109
TPP-18533	germline IgG1 of TPP-15374	HCDR1	DNA	SEQ ID NO: 110
TPP-18533	germline IgG1 of TPP-15374	HCDR2	DNA	SEQ ID NO: 111
TPP-18533	germline IgG1 of TPP-15374	HCDR3	DNA	SEQ ID NO: 112
TPP-18533	germline IgG1 of TPP-15374	VL	DNA	SEQ ID NO: 113
TPP-18533	germline IgG1 of TPP-15374	LCDR1	DNA	SEQ ID NO: 114
TPP-18533	germline IgG1 of TPP-15374	LCDR2	DNA	SEQ ID NO: 115
TPP-18533	germline IgG1 of TPP-15374	LCDR3	DNA	SEQ ID NO: 116
TPP-18533	germline IgG1 of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 117
TPP-18533	germline IgG1 of TPP-15374	Light Chain	PRT	SEQ ID NO: 118
TPP-18533	germline IgG1 of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 119
TPP-18533	germline IgG1 of TPP-15374	Light Chain	DNA	SEQ ID NO: 120
TPP-21565	germline IgG1 of TPP-15370	VH	PRT	SEQ ID NO: 121
TPP-21565	germline IgG1 of TPP-15370	HCDR1	PRT	SEQ ID NO: 122
TPP-21565	germline IgG1 of TPP-15370	HCDR2	PRT	SEQ ID NO: 123
TPP-21565	germline IgG1 of TPP-15370	HCDR3	PRT	SEQ ID NO: 124
TPP-21565	germline IgG1 of TPP-15370	VL	PRT	SEQ ID NO: 125
TPP-21565	germline IgG1 of TPP-15370	LCDR1	PRT	SEQ ID NO: 126
TPP-21565	germline IgG1 of TPP-15370	LCDR2	PRT	SEQ ID NO: 127
TPP-21565	germline IgG1 of TPP-15370	LCDR3	PRT	SEQ ID NO: 128
TPP-21565	germline IgG1 of TPP-15370	VH	DNA	SEQ ID NO: 129
TPP-21565	germline IgG1 of TPP-15370	HCDR1	DNA	SEQ ID NO: 130
TPP-21565	germline IgG1 of TPP-15370	HCDR2	DNA	SEQ ID NO: 131
TPP-21565	germline IgG1 of TPP-15370	HCDR3	DNA	SEQ ID NO: 132
TPP-21565	germline IgG1 of TPP-15370	VL	DNA	SEQ ID NO: 133
TPP-21565	germline IgG1 of TPP-15370	LCDR1	DNA	SEQ ID NO: 134
TPP-21565	germline IgG1 of TPP-15370	LCDR2	DNA	SEQ ID NO: 135
TPP-21565	germline IgG1 of TPP-15370	LCDR3	DNA	SEQ ID NO: 136
TPP-21565	germline IgG1 of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 137
TPP-21565	germline IgG1 of TPP-15370	Light Chain	PRT	SEQ ID NO: 138
TPP-21565	germline IgG1 of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 139
TPP-21565	germline IgG1 of TPP-15370	Light Chain	DNA	SEQ ID NO: 140
TPP-23298	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 141
TPP-23298	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 142
TPP-23298	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 143
TPP-23298	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 144
TPP-23298	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 145
TPP-23298	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 146
TPP-23298	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 147
TPP-23298	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 148
TPP-23298	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 149
TPP-23298	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 150
TPP-23298	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 151
TPP-23298	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 152
TPP-23298	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 153
TPP-23298	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 154
TPP-23298	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 155
TPP-23298	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 156

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-23298	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 157
TPP-23298	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 158
TPP-23298	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 159
TPP-23298	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 160
TPP-23334	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 161
TPP-23334	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 162
TPP-23334	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 163
TPP-23334	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 164
TPP-23334	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 165
TPP-23334	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 166
TPP-23334	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 167
TPP-23334	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 168
TPP-23334	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 169
TPP-23334	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 170
TPP-23334	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 171
TPP-23334	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 172
TPP-23334	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 173
TPP-23334	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 174
TPP-23334	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 175
TPP-23334	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 176
TPP-23334	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 177
TPP-23334	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 178
TPP-23334	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 179
TPP-23334	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 180
TPP-23337	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 181
TPP-23337	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 182
TPP-23337	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 183
TPP-23337	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 184
TPP-23337	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 185
TPP-23337	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 186
TPP-23337	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 187
TPP-23337	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 188
TPP-23337	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 189
TPP-23337	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 190
TPP-23337	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 191
TPP-23337	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 192
TPP-23337	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 193
TPP-23337	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 194
TPP-23337	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 195
TPP-23337	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 196
TPP-23337	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 197
TPP-23337	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 198
TPP-23337	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 199
TPP-23337	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 200
TPP-23338	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 201
TPP-23338	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 202
TPP-23338	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 203
TPP-23338	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 204
TPP-23338	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 205
TPP-23338	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 206
TPP-23338	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 207
TPP-23338	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 208
TPP-23338	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 209
TPP-23338	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 210
TPP-23338	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 211
TPP-23338	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 212
TPP-23338	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 213
TPP-23338	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 214
TPP-23338	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 215
TPP-23338	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 216
TPP-23338	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 217
TPP-23338	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 218
TPP-23338	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 219
TPP-23338	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 220
TPP-23340	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 221
TPP-23340	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 222
TPP-23340	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 223
TPP-23340	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 224
TPP-23340	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 225
TPP-23340	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 226
TPP-23340	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 227

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-23340	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 228
TPP-23340	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 229
TPP-23340	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 230
TPP-23340	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 231
TPP-23340	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 232
TPP-23340	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 233
TPP-23340	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 234
TPP-23340	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 235
TPP-23340	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 236
TPP-23340	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 237
TPP-23340	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 238
TPP-23340	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 239
TPP-23340	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 240
TPP-23341	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 241
TPP-23341	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 242
TPP-23341	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 243
TPP-23341	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 244
TPP-23341	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 245
TPP-23341	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 246
TPP-23341	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 247
TPP-23341	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 248
TPP-23341	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 249
TPP-23341	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 250
TPP-23341	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 251
TPP-23341	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 252
TPP-23341	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 253
TPP-23341	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 254
TPP-23341	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 255
TPP-23341	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 256
TPP-23341	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 257
TPP-23341	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 258
TPP-23341	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 259
TPP-23341	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 260
TPP-23345	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 261
TPP-23345	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 262
TPP-23345	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 263
TPP-23345	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 264
TPP-23345	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 265
TPP-23345	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 266
TPP-23345	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 267
TPP-23345	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 268
TPP-23345	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 269
TPP-23345	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 270
TPP-23345	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 271
TPP-23345	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 272
TPP-23345	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 273
TPP-23345	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 274
TPP-23345	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 275
TPP-23345	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 276
TPP-23345	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 277
TPP-23345	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 278
TPP-23345	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 279
TPP-23345	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 280
TPP-23346	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 281
TPP-23346	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 282
TPP-23346	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 283
TPP-23346	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 284
TPP-23346	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 285
TPP-23346	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 286
TPP-23346	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 287
TPP-23346	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 288
TPP-23346	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 289
TPP-23346	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 290
TPP-23346	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 291
TPP-23346	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 292
TPP-23346	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 293
TPP-23346	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 294
TPP-23346	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 295
TPP-23346	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 296
TPP-23346	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 297
TPP-23346	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 298

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-23346	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 299
TPP-23346	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 300
TPP-23347	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 301
TPP-23347	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 302
TPP-23347	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 303
TPP-23347	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 304
TPP-23347	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 305
TPP-23347	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 306
TPP-23347	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 307
TPP-23347	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 308
TPP-23347	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 309
TPP-23347	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 310
TPP-23347	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 311
TPP-23347	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 312
TPP-23347	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 313
TPP-23347	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 314
TPP-23347	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 315
TPP-23347	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 316
TPP-23347	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 317
TPP-23347	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 318
TPP-23347	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 319
TPP-23347	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 320
TPP-23373	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 321
TPP-23373	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 322
TPP-23373	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 323
TPP-23373	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 324
TPP-23373	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 325
TPP-23373	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 326
TPP-23373	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 327
TPP-23373	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 328
TPP-23373	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 329
TPP-23373	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 330
TPP-23373	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 331
TPP-23373	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 332
TPP-23373	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 333
TPP-23373	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 334
TPP-23373	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 335
TPP-23373	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 336
TPP-23373	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 337
TPP-23373	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 338
TPP-23373	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 339
TPP-23373	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 340
TPP-23374	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 341
TPP-23374	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 342
TPP-23374	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 343
TPP-23374	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 344
TPP-23374	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 345
TPP-23374	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 346
TPP-23374	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 347
TPP-23374	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 348
TPP-23374	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 349
TPP-23374	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 350
TPP-23374	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 351
TPP-23374	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 352
TPP-23374	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 353
TPP-23374	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 354
TPP-23374	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 355
TPP-23374	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 356
TPP-23374	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 357
TPP-23374	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 358
TPP-23374	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 359
TPP-23374	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 360
TPP-23375	Recombi Variant of TPP-15370	VH	PRT	SEQ ID NO: 361
TPP-23375	Recombi Variant of TPP-15370	HCDR1	PRT	SEQ ID NO: 362
TPP-23375	Recombi Variant of TPP-15370	HCDR2	PRT	SEQ ID NO: 363
TPP-23375	Recombi Variant of TPP-15370	HCDR3	PRT	SEQ ID NO: 364
TPP-23375	Recombi Variant of TPP-15370	VL	PRT	SEQ ID NO: 365
TPP-23375	Recombi Variant of TPP-15370	LCDR1	PRT	SEQ ID NO: 366
TPP-23375	Recombi Variant of TPP-15370	LCDR2	PRT	SEQ ID NO: 367
TPP-23375	Recombi Variant of TPP-15370	LCDR3	PRT	SEQ ID NO: 368
TPP-23375	Recombi Variant of TPP-15370	VH	DNA	SEQ ID NO: 369

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-23375	Recombi Variant of TPP-15370	HCDR1	DNA	SEQ ID NO: 370
TPP-23375	Recombi Variant of TPP-15370	HCDR2	DNA	SEQ ID NO: 371
TPP-23375	Recombi Variant of TPP-15370	HCDR3	DNA	SEQ ID NO: 372
TPP-23375	Recombi Variant of TPP-15370	VL	DNA	SEQ ID NO: 373
TPP-23375	Recombi Variant of TPP-15370	LCDR1	DNA	SEQ ID NO: 374
TPP-23375	Recombi Variant of TPP-15370	LCDR2	DNA	SEQ ID NO: 375
TPP-23375	Recombi Variant of TPP-15370	LCDR3	DNA	SEQ ID NO: 376
TPP-23375	Recombi Variant of TPP-15370	Heavy Chain	PRT	SEQ ID NO: 377
TPP-23375	Recombi Variant of TPP-15370	Light Chain	PRT	SEQ ID NO: 378
TPP-23375	Recombi Variant of TPP-15370	Heavy Chain	DNA	SEQ ID NO: 379
TPP-23375	Recombi Variant of TPP-15370	Light Chain	DNA	SEQ ID NO: 380
TPP-25064	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 381
TPP-25064	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 382
TPP-25064	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 383
TPP-25064	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 384
TPP-25064	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 385
TPP-25064	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 386
TPP-25064	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 387
TPP-25064	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 388
TPP-25064	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 389
TPP-25064	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 390
TPP-25064	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 391
TPP-25064	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 392
TPP-25064	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 393
TPP-25064	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 394
TPP-25064	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 395
TPP-25064	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 396
TPP-25064	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 397
TPP-25064	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 398
TPP-25064	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 399
TPP-25064	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 400
TPP-25224	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 401
TPP-25224	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 402
TPP-25224	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 403
TPP-25224	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 404
TPP-25224	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 405
TPP-25224	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 406
TPP-25224	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 407
TPP-25224	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 408
TPP-25224	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 409
TPP-25224	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 410
TPP-25224	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 411
TPP-25224	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 412
TPP-25224	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 413
TPP-25224	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 414
TPP-25224	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 415
TPP-25224	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 416
TPP-25224	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 417
TPP-25224	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 418
TPP-25224	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 419
TPP-25224	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 420
TPP-25248	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 421
TPP-25248	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 422
TPP-25248	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 423
TPP-25248	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 424
TPP-25248	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 425
TPP-25248	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 426
TPP-25248	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 427
TPP-25248	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 428
TPP-25248	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 429
TPP-25248	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 430
TPP-25248	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 431
TPP-25248	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 432
TPP-25248	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 433
TPP-25248	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 434
TPP-25248	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 435
TPP-25248	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 436
TPP-25248	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 437
TPP-25248	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 438
TPP-25248	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 439
TPP-25248	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 440

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-25255	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 441
TPP-25255	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 442
TPP-25255	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 443
TPP-25255	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 444
TPP-25255	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 445
TPP-25255	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 446
TPP-25255	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 447
TPP-25255	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 448
TPP-25255	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 449
TPP-25255	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 450
TPP-25255	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 451
TPP-25255	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 452
TPP-25255	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 453
TPP-25255	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 454
TPP-25255	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 455
TPP-25255	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 456
TPP-25255	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 457
TPP-25255	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 458
TPP-25255	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 459
TPP-25255	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 460
TPP-25256	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 461
TPP-25256	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 462
TPP-25256	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 463
TPP-25256	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 464
TPP-25256	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 465
TPP-25256	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 466
TPP-25256	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 467
TPP-25256	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 468
TPP-25256	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 469
TPP-25256	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 470
TPP-25256	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 471
TPP-25256	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 472
TPP-25256	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 473
TPP-25256	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 474
TPP-25256	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 475
TPP-25256	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 476
TPP-25256	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 477
TPP-25256	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 478
TPP-25256	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 479
TPP-25256	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 480
TPP-25257	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 481
TPP-25257	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 482
TPP-25257	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 483
TPP-25257	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 484
TPP-25257	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 485
TPP-25257	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 486
TPP-25257	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 487
TPP-25257	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 488
TPP-25257	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 489
TPP-25257	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 490
TPP-25257	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 491
TPP-25257	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 492
TPP-25257	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 493
TPP-25257	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 494
TPP-25257	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 495
TPP-25257	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 496
TPP-25257	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 497
TPP-25257	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 498
TPP-25257	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 499
TPP-25257	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 500
TPP-25448	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 501
TPP-25448	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 502
TPP-25448	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 503
TPP-25448	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 504
TPP-25448	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 505
TPP-25448	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 506
TPP-25448	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 507
TPP-25448	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 508
TPP-25448	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 509
TPP-25448	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 510
TPP-25448	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 511

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-25448	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 512
TPP-25448	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 513
TPP-25448	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 514
TPP-25448	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 515
TPP-25448	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 516
TPP-25448	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 517
TPP-25448	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 518
TPP-25448	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 519
TPP-25448	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 520
TPP-25497	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 521
TPP-25497	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 522
TPP-25497	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 523
TPP-25497	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 524
TPP-25497	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 525
TPP-25497	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 526
TPP-25497	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 527
TPP-25497	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 528
TPP-25497	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 529
TPP-25497	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 530
TPP-25497	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 531
TPP-25497	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 532
TPP-25497	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 533
TPP-25497	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 534
TPP-25497	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 535
TPP-25497	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 536
TPP-25497	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 537
TPP-25497	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 538
TPP-25497	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 539
TPP-25497	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 540
TPP-25655	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 541
TPP-25655	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 542
TPP-25655	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 543
TPP-25655	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 544
TPP-25655	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 545
TPP-25655	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 546
TPP-25655	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 547
TPP-25655	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 548
TPP-25655	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 549
TPP-25655	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 550
TPP-25655	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 551
TPP-25655	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 552
TPP-25655	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 553
TPP-25655	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 554
TPP-25655	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 555
TPP-25655	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 556
TPP-25655	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 557
TPP-25655	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 558
TPP-25655	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 559
TPP-25655	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 560
TPP-26111	Recombi Variant of TPP-15374	VH	PRT	SEQ ID NO: 561
TPP-26111	Recombi Variant of TPP-15374	HCDR1	PRT	SEQ ID NO: 562
TPP-26111	Recombi Variant of TPP-15374	HCDR2	PRT	SEQ ID NO: 563
TPP-26111	Recombi Variant of TPP-15374	HCDR3	PRT	SEQ ID NO: 564
TPP-26111	Recombi Variant of TPP-15374	VL	PRT	SEQ ID NO: 565
TPP-26111	Recombi Variant of TPP-15374	LCDR1	PRT	SEQ ID NO: 566
TPP-26111	Recombi Variant of TPP-15374	LCDR2	PRT	SEQ ID NO: 567
TPP-26111	Recombi Variant of TPP-15374	LCDR3	PRT	SEQ ID NO: 568
TPP-26111	Recombi Variant of TPP-15374	VH	DNA	SEQ ID NO: 569
TPP-26111	Recombi Variant of TPP-15374	HCDR1	DNA	SEQ ID NO: 570
TPP-26111	Recombi Variant of TPP-15374	HCDR2	DNA	SEQ ID NO: 571
TPP-26111	Recombi Variant of TPP-15374	HCDR3	DNA	SEQ ID NO: 572
TPP-26111	Recombi Variant of TPP-15374	VL	DNA	SEQ ID NO: 573
TPP-26111	Recombi Variant of TPP-15374	LCDR1	DNA	SEQ ID NO: 574
TPP-26111	Recombi Variant of TPP-15374	LCDR2	DNA	SEQ ID NO: 575
TPP-26111	Recombi Variant of TPP-15374	LCDR3	DNA	SEQ ID NO: 576
TPP-26111	Recombi Variant of TPP-15374	Heavy Chain	PRT	SEQ ID NO: 577
TPP-26111	Recombi Variant of TPP-15374	Light Chain	PRT	SEQ ID NO: 578
TPP-26111	Recombi Variant of TPP-15374	Heavy Chain	DNA	SEQ ID NO: 579
TPP-26111	Recombi Variant of TPP-15374	Light Chain	DNA	SEQ ID NO: 580
TPP-13211	huSema3a_FXaFc	Chain 1	PRT	SEQ ID NO: 581
TPP-19068	human Sema3a_FXaHis6	Chain 1	PRT	SEQ ID NO: 582

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-19069	mouse Sema3a_FXaHis6	Chain 1	PRT	SEQ ID NO: 583
TPP-19120	rat-Sema3a_FXaHis6	Chain 1	PRT	SEQ ID NO: 584
TPP-19121	dog-Sema3a_FXaHis6	Chain 1	PRT	SEQ ID NO: 585
TPP-19122	cyno-Sema3a_FXaHis6	Chain 1	PRT	SEQ ID NO: 586
TPP-20176	pigSema3A_FXaHis6	Chain 1	PRT	SEQ ID NO: 587
TPP-30788	Böhringer (BI) Clone I	VH	PRT	SEQ ID NO: 800
TPP-30788	Böhringer (BI) Clone I	HCDR1	PRT	SEQ ID NO: 801
TPP-30788	Böhringer (BI) Clone I	HCDR2	PRT	SEQ ID NO: 802
TPP-30788	Böhringer (BI) Clone I	HCDR3	PRT	SEQ ID NO: 803
TPP-30788	Böhringer (BI) Clone I	VL	PRT	SEQ ID NO: 804
TPP-30788	Böhringer (BI) Clone I	LCDR1	PRT	SEQ ID NO: 805
TPP-30788	Böhringer (BI) Clone I	LCDR2	PRT	SEQ ID NO: 806
TPP-30788	Böhringer (BI) Clone I	LCDR3	PRT	SEQ ID NO: 807
TPP-30788	Böhringer (BI) Clone I	VH	DNA	SEQ ID NO: 808
TPP-30788	Böhringer (BI) Clone I	VL	DNA	SEQ ID NO: 809
TPP-30788	Böhringer (BI) Clone I	Heavy Chain	PRT	SEQ ID NO: 810
TPP-30788	Böhringer (BI) Clone I	Light Chain	PRT	SEQ ID NO: 811
TPP-30788	Böhringer (BI) Clone I	Heavy Chain	DNA	SEQ ID NO: 812
TPP-30788	Böhringer (BI) Clone I	Light Chain	DNA	SEQ ID NO: 813
TPP-30789	Böhringer (BI) Clone II	VH	PRT	SEQ ID NO: 814
TPP-30789	Böhringer (BI) Clone II	HCDR1	PRT	SEQ ID NO: 815
TPP-30789	Böhringer (BI) Clone II	HCDR2	PRT	SEQ ID NO: 816
TPP-30789	Böhringer (BI) Clone II	HCDR3	PRT	SEQ ID NO: 817
TPP-30789	Böhringer (BI) Clone II	VL	PRT	SEQ ID NO: 818
TPP-30789	Böhringer (BI) Clone II	LCDR1	PRT	SEQ ID NO: 819
TPP-30789	Böhringer (BI) Clone II	LCDR2	PRT	SEQ ID NO: 820
TPP-30789	Böhringer (BI) Clone II	LCDR3	PRT	SEQ ID NO: 821
TPP-30789	Böhringer (BI) Clone II	VH	DNA	SEQ ID NO: 822
TPP-30789	Böhringer (BI) Clone II	VL	DNA	SEQ ID NO: 823
TPP-30789	Böhringer (BI) Clone II	Heavy Chain	PRT	SEQ ID NO: 824
TPP-30789	Böhringer (BI) Clone II	Light Chain	PRT	SEQ ID NO: 825
TPP-30789	Böhringer (BI) Clone II	Heavy Chain	DNA	SEQ ID NO: 826
TPP-30789	Böhringer (BI) Clone II	Light Chain	DNA	SEQ ID NO: 827
TPP-30790	Böhringer (BI) Clone III	VH	PRT	SEQ ID NO: 828
TPP-30790	Böhringer (BI) Clone III	HCDR1	PRT	SEQ ID NO: 829
TPP-30790	Böhringer (BI) Clone III	HCDR2	PRT	SEQ ID NO: 830
TPP-30790	Böhringer (BI) Clone III	HCDR3	PRT	SEQ ID NO: 831
TPP-30790	Böhringer (BI) Clone III	VL	PRT	SEQ ID NO: 832
TPP-30790	Böhringer (BI) Clone III	LCDR1	PRT	SEQ ID NO: 833
TPP-30790	Böhringer (BI) Clone III	LCDR2	PRT	SEQ ID NO: 834
TPP-30790	Böhringer (BI) Clone III	LCDR3	PRT	SEQ ID NO: 835
TPP-30790	Böhringer (BI) Clone III	VH	DNA	SEQ ID NO: 836
TPP-30790	Böhringer (BI) Clone III	VL	DNA	SEQ ID NO: 837
TPP-30790	Böhringer (BI) Clone III	Heavy Chain	PRT	SEQ ID NO: 838
TPP-30790	Böhringer (BI) Clone III	Light Chain	PRT	SEQ ID NO: 839
TPP-30790	Böhringer (BI) Clone III	Heavy Chain	DNA	SEQ ID NO: 840
TPP-30790	Böhringer (BI) Clone III	Light Chain	DNA	SEQ ID NO: 841
TPP-30791	Böhringer (BI) Clone IV	VH	PRT	SEQ ID NO: 842
TPP-30791	Böhringer (BI) Clone IV	HCDR1	PRT	SEQ ID NO: 843
TPP-30791	Böhringer (BI) Clone IV	HCDR2	PRT	SEQ ID NO: 844
TPP-30791	Böhringer (BI) Clone IV	HCDR3	PRT	SEQ ID NO: 845
TPP-30791	Böhringer (BI) Clone IV	VL	PRT	SEQ ID NO: 846
TPP-30791	Böhringer (BI) Clone IV	LCDR1	PRT	SEQ ID NO: 847
TPP-30791	Böhringer (BI) Clone IV	LCDR2	PRT	SEQ ID NO: 848
TPP-30791	Böhringer (BI) Clone IV	LCDR3	PRT	SEQ ID NO: 849
TPP-30791	Böhringer (BI) Clone IV	VH	DNA	SEQ ID NO: 850
TPP-30791	Böhringer (BI) Clone IV	VL	DNA	SEQ ID NO: 851
TPP-30791	Böhringer (BI) Clone IV	Heavy Chain	PRT	SEQ ID NO: 852
TPP-30791	Böhringer (BI) Clone IV	Light Chain	PRT	SEQ ID NO: 853
TPP-30791	Böhringer (BI) Clone IV	Heavy Chain	DNA	SEQ ID NO: 854
TPP-30791	Böhringer (BI) Clone IV	Light Chain	DNA	SEQ ID NO: 855
TPP-30792	3H4 (Ramot) Clon I	VH	PRT	SEQ ID NO: 856
TPP-30792	3H4 (Ramot) Clon I	HCDR1	PRT	SEQ ID NO: 857
TPP-30792	3H4 (Ramot) Clon I	HCDR2	PRT	SEQ ID NO: 858
TPP-30792	3H4 (Ramot) Clon I	HCDR3	PRT	SEQ ID NO: 859
TPP-30792	3H4 (Ramot) Clon I	VL	PRT	SEQ ID NO: 860
TPP-30792	3H4 (Ramot) Clon I	LCDR1	PRT	SEQ ID NO: 861
TPP-30792	3H4 (Ramot) Clon I	LCDR2	PRT	SEQ ID NO: 862
TPP-30792	3H4 (Ramot) Clon I	LCDR3	PRT	SEQ ID NO: 863
TPP-30792	3H4 (Ramot) Clon I	VH	DNA	SEQ ID NO: 864
TPP-30792	3H4 (Ramot) Clon I	VL	DNA	SEQ ID NO: 865

TABLE 1-continued

Amino acid sequences and nucleic acid sequences of preferred antibodies according to the present disclosure and of three prior art antibodies. TPP-11489 corresponds to Chiome antibody Humanized-2 derived of clone No. 4-2 strain (WO 2014/123186); TPP-15051 represents a murine IgG1 variant thereof. TPP-30788-TPP-30791 corresponds to Böhringer Ingelheim antibody (BI) Clone I-IV (WO 2020/225400). TPP-30792 corresponds to University Ramot antibody clone I (WO 2020/261281).

TPP ID	Antibody Description	Sequence Region	Sequence Type	SEQ ID
TPP-30792	3H4 (Ramot) Clon I	Heavy Chain	PRT	SEQ ID NO: 866
TPP-30792	3H4 (Ramot) Clon I	Light Chain	PRT	SEQ ID NO: 867
TPP-30792	3H4 (Ramot) Clon I	Heavy Chain	DNA	SEQ ID NO: 868
TPP-30792	3H4 (Ramot) Clon I	Light Chain	DNA	SEQ ID NO: 869
TPP-31357	Fab of 3H4 Univ Ramot	VH	PRT	SEQ ID NO: 870
TPP-31357	Fab of 3H4 Univ Ramot	HCDR1	PRT	SEQ ID NO: 871
TPP-31357	Fab of 3H4 Univ Ramot	HCDR2	PRT	SEQ ID NO: 872
TPP-31357	Fab of 3H4 Univ Ramot	HCDR3	PRT	SEQ ID NO: 873
TPP-31357	Fab of 3H4 Univ Ramot	VL	PRT	SEQ ID NO: 874
TPP-31357	Fab of 3H4 Univ Ramot	LCDR1	PRT	SEQ ID NO: 875
TPP-31357	Fab of 3H4 Univ Ramot	LCDR2	PRT	SEQ ID NO: 876
TPP-31357	Fab of 3H4 Univ Ramot	LCDR3	PRT	SEQ ID NO: 877
TPP-31357	Fab of 3H4 Univ Ramot	VH	DNA	SEQ ID NO: 878
TPP-31357	Fab of 3H4 Univ Ramot	VL	DNA	SEQ ID NO: 879
TPP-31357	Fab of 3H4 Univ Ramot	Heavy Chain	PRT	SEQ ID NO: 880
TPP-31357	Fab of 3H4 Univ Ramot	Light Chain	PRT	SEQ ID NO: 881
TPP-31357	Fab of 3H4 Univ Ramot	Heavy Chain	DNA	SEQ ID NO: 882
TPP-31357	Fab of 3H4 Univ Ramot	Light Chain	DNA	SEQ ID NO: 883

TABLE 1A

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID NO	SEQ Type	SEQUENCE
1	PRT	EVQLLESGGGGLVQPGGSLRLSCAASGFTFSSYPMGWVRQAPGKGLEWV AGIDDDGDSDTRYAPAVKGRATISRDNISKNTVYLQMNSLRAEDTAVYY CAKHTGIGANSAGSIDAWGQQTLVTVSS
2	PRT	SYPMG
3	PRT	GIDDDGDSDTRYAPAVKG
4	PRT	HTGIGANSAGSIDA
5	PRT	SYELTQPPSVSPGQTARITCSGGGSYTGSYYYGWYQQKPGQAPVTI YNNKRPSDIPERFSGSLSGTTNTLTISGVQAEDYYCGSADNSGDAF GTGTVT
6	PRT	SGGGSYTGSYYYG
7	PRT	YNNKRPS
8	PRT	GSADNSGDA
9	DNA	GAAGTTCTAGCTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCTTCACCTTTAGCAGCT ATCCTATGGGCTGGGCTCGACAGGCCCTGGCAAAGGACTTGAATGG GTGGCGCATCGACGACGATGGCGATAGCGATAACAAGATAACGCC CTGGCGTAAGGGCAGGCCACCATCTCCAGAGACAACAGCAAGAA CACCGTGATACCTGCAGATGAACAGCTTGAGAGCCGAGGACACCGCC GTGTACTATTGTGCCAACACAGGCATCGGCCATTCTGCCGG CTCTATTGATGCCCTGGGCCAGGGAACACTGGTCACAGTTCTTC
10	DNA	AGCTATCCTATGGGC
11	DNA	GGCATCGACGACGATGGCGATAGCGATAACAAGATAACGCCCTGCCGT GAAGGGC
12	DNA	CACACAGGCATCGGCCAACCTCTGCCCTCTATTGATGCC
13	DNA	AGCTATGAGCTGACACAGCCTCCAAGCGTGTCCGTCTCCTGGACA GACCGCCAGAACATGTAGCGCGAGGCAGCTACACGGCAGC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		TACTACTATGGCTGGTATCAGCAGAACGCCGGACAGGCCCTGTGAC CGTGATCTACTACAACAAACAAGCGGCCAGCGACATCCCCGAGAGAT TTCTGGCTCTGTAGCGGCCAGCCAAACACACTGACAATCTCTGGC GTGCAGGCCGAGGACAGGCCGATTACTATTGTGGCAGGCCGATAA TAGGCCGACGCCCTTGGCACCGCACAAAGTTACAGTCCTGA
14	DNA	AGCGCGGGAGGCAGCTACACCGGCAGCTACTATGGC
15	DNA	TACAACAAACAAGCGGCCAGC
16	DNA	GGCAGCGCCGATAATAGCGGCCAGC
17	PRT	EVQLLESGGGLVQPQGSLRLSCAASGFTFSSYPMGVWRQAPGKLEWV AGIDDDGSDSTRYAPAVKGRATISRDNSKNTVYLQMNLSRAEDTAVYY CAKHTGIGANSAGSIDAWGQGTLVTVSASTKGPSVPLAPSSKSTSGGT AALGCLVKDYPPEPVTVWSWSALTSVHFPAVLQSSGLYSSLSSVTV PSSSLGTQTYICNVNHPKPSNTKVDKKVEPKSCDKTHTCPCCPAPELLGGP SVFLFPKPKDTLMISRTPETVTVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTI SKAKQGPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPPSDIAVEWESNG QPNENYKTTPPVVLDSGSFFLYSKLTVDKSRWQQCNVFSCSVVMHEALH NHYTQKSLSLSPG
18	PRT	SYELTQPPSVSVPQQTARITCSGGGSYTGSYYYGWYQQKPGQAPVTI YYNNKRPSDIPERFSGSLSGTTNTLTIISGVQAEDAEADYYCGSADNSGDAF GTGTKVTVLGQPKAAPSUTLFPSSSEELQANKATLVLCLISDFYPGAVTVA WKADSSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSQCQV THEGSTVEKTVPTECS
19	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGCTTACCTTTAGCAGCT ATCCTATGGCTGGGCTGGCACAGGCCCTGGCAAAGGACTTGAATGG GTGCCGCCATCGACGACGATGGCGATAGCGATAACAAGATACTGCC CTGCCGTGAAGGCCAGGCCACATCTCCAGAGACAACAGCAAGAA CACCGTGACTCGCAGATGAACAGCTGAGAGCCGAGGACACCGCC GTGTAATTGTGCCAAGCACAGGCATCGCGCCAAATTCTGCC CTCTATTGATCCTGGGCCAGGGAAACTGGTACAGTTCTTCAG CCAGCACCAAGGCCCTGGCTTCCCTGGCCCTAGCAGCAAG AGCACATCTGGCGAACAGCCGCCCTGGCTGCCTGTGAAGGACTA CTTTCCGAGCCGTGACCCTGTCTGGAACTCTGGCGCTGTGACAA GCCGCGTGCACACCTTCCAGCCGTGCTGAGAGCAGGCCCTGTAC TCTCTGAGCAGCGTGTGACAGTGGCCAGCAGCTCTGGCACCCA GACCTACATCTGCAACGTGAACCAAGGCCAGCAACACCAAGGTG GACAAGAGGTGGAACCCAAGCTCGACAAGAGCCACACCTGT CCCCCTTGCTCTGCCCGAAGTGCCTGGAGGCCCTTCGTGTTCTGT TCCCCCCTAACGCAAGGACACCCCTGATGATCAGCGGAGCCCGAA GTGACCTGCGTGGTGGATGTGTCCTCACGAGGACCTGAAGTGAA GTTCAATGGTACGTGGACGCCGTGGAGATGCAACACGCCAGCCA AGCCTAGAGAGGAAACGATACAACAGCACCTACCGGGTGGTCCGT GCTGACAGTGTGCACTGGACTGGCTGAACGGCAAAGAGTACAAAG TGCAAGGTGTCAACAAGGCCCTGCCGTGCCCATCGAGAAAACCAT CAGCAAGGCCAGGGCCAGGCCGAACCCCAAGGTACACACTG CCCCCAAGCAGGGACAGCTGACCAAGAACCCAGGTGCCCCCTGACCTG TCTCGTGAAGGCTTCTACCCCTCCGATATGCCGTGAAATGGGAGA GCAACGGCCAGCCCGAGAACAAACTACAAGACCACCCCCCTGTGCTG GACAGCGACGGCTATTCTCTGTACAGCAAGCTGACCGTGGACAA GTCCTGGCAGCGGGCAACGCTGTTCACTGAGCGTGTGACAG AGGCCCTGCAACACCAACTACACCCAGAGTCCCTGAGCCCTGAGCC GGC
20	DNA	AGCTATGAGCTGACACAGCCTCAAGCGTGTCCGTGTCCTGGACA GACGCCAGAACATCACATGTAGCGCCGAGCGTACACCGCGAC TACTACTATGGCTGGTATCAGCAGAACGCCGGACAGGCCCTGTGAC CGTGATCTACTACAACAAAGCGGCCAGCGACATCCCCGAGAGAT TTCTGGCTCTGTAGCGGCCAGCCAAACACACTGACAATCTCTGGC GTGCAGGCCGAGGACAGGCCGATTACTATTGTGGCAGGCCGATAA TAGCGCCGACGCCCTTGGCACCGCACCAAGTTACAGTGTAGGCC AGCCTAAAGCGCCCTAGCGTACCCCTGTGCTGAGCGACTT GAACTGAGGCCACAAGGCCACCCCTGTGCTGAGCGACTT CTATCTGGCGCCGTGACCGTGGCTGGAAGGCCGATAGCTCTCTG TGAAGGCCGGTGGAAACCACCAACCCCTAGCAAGCAGGCCAA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		CAAAATACGCCGCCAGCAGCTACCTGAGCCTGACCCCCGAGCAGTGGAA AGTCCCACAGATCCTACAGCTGCCAACAGTGACCCACGAGGGCAGCACCG GTGGAAAAGACAGTGGCCCTACCGAGTCAGC
21	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFSSYPMGVWRQAPGKGLEWV AGIDDDGDSDTRYAPAVKGRATISRDNSKNTVYLQMNNSRAEDTAVYY CAKHTGIGANSAGSIDAWGQQGTLTVSS
22	PRT	SYPMG
23	PRT	GIDDDGDSDTRYAPAVKG
24	PRT	HTGIGANSAGSIDA
25	PRT	SYELTQPPSVSPGQTARITCSGGGSYTGSYYYGWWQQKPGQAPVTIVI YYNNKRPSDIPERFSGSLSGTTNTLTISGVQAEDADYYCGSADNSGDAF GTGTTKVTL
26	PRT	SGGGSYTGSYYYG
27	PRT	YNNKRPS
28	PRT	GSADNSGDA
29	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCACCTTAGCAGCT ATCCTATGGGCTGGGCTCGACAGGCCCTGGCAAAGGACTTGAATGG GTGCGCGCATCGACGACGATGGCGATAGCGATAACAAGATAACGCCC CTGCCGTGAAGGGCAGGCCACCATCTCCAGAGACAACAGCAAGAA CACCGTGTACCTGCAGATGAACTGAGAGCCGAGGGACACCGCC GTGTACTATTGTGCCAACACAGGCATGGCGCCAATTCTGCCGG CTCTATTGATGCCCTGGGCCAGGGAACACTGGTCACAGTTCTTC
30	DNA	AGCTATCCTATGGGC
31	DNA	GGCATCGACGACGATGGCGATAGCGATAACAAGATAACGCCCTGCCGT GAAGGGC
32	DNA	CACACAGGCATGGCGCCAATTCTGCCGGCTCTATTGATGCC
33	DNA	AGCTATGAGCTGACACAGCCTCCAAGCGTGTCCGTGTCCTGGACA GACCGCCAGAACATCACATGTAGCGCCGAGGCAGCTACACCGGCAGC TACTACTATGGCTGGTATCAGCAGAACAGCCGGACAGGCCCTGTGAC CGTGATCTACTAACAAACAAAGCGGCCAGCGACATCCCGAGAGAT TTTCTGGCTCTCTGAGGGCACCCACACACTGACAATCTCTGGC GTGCAGGCCGAGGGACAGGGCGATTACTATTGTGCCAGGCCGATAA TAGCGGCCGACGCCCTTGGCACCGGACCAAAGTTACAGTGCTA
34	DNA	AGCGGGCGAGGCAGCTACACCGCAGCTACTACTATGGC
35	DNA	TACAACAACAAGCGGCCAGC
36	DNA	GGCAGCGCCGATAATAGCGGGGACGCC
37	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFSSYPMGVWRQAPGKGLEWV AGIDDDGDSDTRYAPAVKGRATISRDNSKNTVYLQMNNSRAEDTAVYY CAKHTGIGANSAGSIDAWGQQGTLTVSSAKTTPPSVYPLAPGSAAQTS MVTGLCLVKGYFPEPVTVTWSGSLSGVHTFPAVLQSDLYTLLSSVTV PSSTWPSETVTCNVAPHASSTKVDKIVPRDCGCKPCICTVPEVSSVFI PKPKDVLITITLTPKVTCVVVDISKDDPEVQFSWFDDVEVHTAQTPRE EQFNSTFRSVSELPIMHQDWLNGKEFKCRVNSAAPPAPIEKTKGRP KAPQVYTI PPPKEQMAKDVKSLTCMTDFPPEDITVEWQWNGQPAENYK NTQPIMDTDGSYFVYSKLNQKSWEAGNTFTCSVHLHEGLHNHTEKS LSHSPGK
38	PRT	SYELTQPPSVSPGQTARITCSGGGSYTGSYYYGWWQQKPGQAPVTIVI YYNNKRPSDIPERFSGSLSGTTNTLTISGVQAEDADYYCGSADNSGDAF GTGTTKVTLGQPKSSPSVTLFPPSSEELETNKATLVCITIDFYPGVTV WKVDGTPVTQGMETTQPSKQSNNKYMASSYLTLTARAWERHSSYSCQ VTHEGHTVEKSLSRADCS

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No.	SEQ Type	SEQUENCE
39	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCACCTTTAGCAGCT ATCCTATGGGCTGGGCTCCGACAGGCCCTGGCAAAGGACTTGAATGG GTGCCGCCATCGACGACGATGGCGATAGCGATAAAAGATAACGCC CTGCCGTGAAGGGCAGGCCACCATCTCCAGAGACAACGCCAAGAA CACCGTGTACCTGCAGATGAAACAGCCTGAGAGCCGAGGCC GTGTACTATTGTGCAAGAACACAGGCATCGGCCAATTCCTGCC CTCTATTGATGCCCTGGGGCAGGGAAACACTGGTACACAGTTCTCAG CCAAGACCAACCCCCCCCAGCGTGTACCTCTGGCTCTGGATCTGCC GCCAGACCAACAGCATGGTACCCCTGGCTGCCCTGTGAAGGGCTA CTTCCCGTGAGCCTGTAACCTGGAACAGCGCTCTCTGTCTAG CGGCGTGCACACCTTCCAGCCGCTGCTGCAGAGCGACCTGTACACCC TGAGCACGGCTGACGGTGTGCTTAGCAGCACCTGCCAGCAGCAAAAGGTGGACA GTGACCTGCAACGTGCCACCCCTGCCAGCAGCACAAAGGTGGACA AGAAAATCGTGGCCCCGGACTGCGGTGCAAGGCCCTGTATCTGTACC GTGCCCCGAGGTGTCAGCTGTTCATCTCCCACCCAAGGCCAAGGA CGTGTGACCATCACCTGACCCCAAAGTGACCTGTGTTGTTGG ACATCAGCAAGGACGACCCGAGGTGCAAGTGTTGTTGTTGTTGGAC GACGTGGAAAGTGCACACAGCCAGACCCAGGCCAGAGGAAACAGT TCAACAGCACCTCAGAAGCGTGTCCAGGCTGCCATCATGCACCAAG GACTGGCTGAACGGAAAGAGTTCAAGTGCAAGTGAAACAGCG CCTTCCCTGCCCATCGAGAAAACCATCTCAAGACAAAGGGCAGA CCCAAGGCCCTCAGGTGACACAATCCCCCACCCAAAGAACAGAT GGCAGGACAAGGACATACCGTGGAACTGGCAAGGCCAGGCCAG GAAGTACAAGAACACCCAGCTATCATGGCACCCAGGCCAGCTACT TCGTGTACAGCAAGCTGAACGTGCAAGAAGTCAACTGGGAGGCC CAACACCTCACCTGTAGCGTGTGCAACGAGGGCTGACAATCACC ACACCGAGAAGTCCCTGCCCCACAGGCCCTGGCAAG
40	DNA	AGCTATGAGCTGACACAGCCTCCAAGCGTGTCCGTGTCCTGGACA GACCGCCAGAAATCACATGTTAGCGGCCAGGCAGCTACACGGCAGC TACTACTATGGCTGGTATCAGCAGAAAGCCCGACAGGCCCTGTGAC CGTGATCTACTACAACAAAGGCCAGCCGACATCCCGAGAGAT TTTCTGGCTCTGTGAGCGGCCACCAACACACTGACAATCTCTGGC GTGCAGGCCGAGGACGGGCCGATTACTATTGTGCCAGGCCGATAA TAGCGGCCGACCCCTTGGCACCCGACCAAAGTTACAGTGCTAGGCC AGCCCAAGAGCAGCCCTAGCGTGACCCCTGTCACCATCAGCGAG GAACTGGAAACAAACAAGGCCACCCCTGTGCAACCATCAGCGACTT CTACCCGGCTGTCGTCAGCGTGGACTGGAAGGTGGACGCCACCCAG TGACCCAGGGCATGGAAACACCCAGCCAGCAAGCAGCAACAA CAAGTACATGCCAGCAGCTACCCGACCTGACCCAGGCCAGCGTGG AGAGACACAGCTCTACAGCTGCAAGTGACCCACGAGGGCCACAC CGTGGAAAAGAGCCTGAGCAGAGGCCACTGCAGC
41	PRT	EVQLLESGGGLVQPQPGSRLSCAASGFTFSSYGMHWVRQAPGKGLEW SAIGTGGDTYYADSVMRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDVWQGQLTVTVSS
42	PRT	SYGMH
43	PRT	AIGTGGDTYYADSVMG
44	PRT	RDDYTSRDAFDV
45	PRT	QSVLTOPPSASGTPQRVTI SCGSNNSNIGSNTVNWYQQLPGTAKLILYY DDLLPSPGVDRFGSKSGTSASLAISGLRSEDEADYYCAAWDDSLNGYV VFGGGTKLTVL
46	PRT	SGSSSNIGSNTVN
47	PRT	YDDLLPS
48	PRT	AAWDDDSLNGYVV
49	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCACCTTTAGCAGCT ATGGCATGCAGTGGCTCCGACAGGCCCTGGCAAAGGACTTGAATGG GTGTGCCCATCGGCACAGGCCGAGTACCTACTATGCCGATAGCGT GATGGCGAGATTCAACCATCAGCCGGACACAGCAAGAACACCCCTG TACCTGCAAGATGAAACAGCCTGAGAGCGAGGCCACCGCCGTACTA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		TTGCCAGAGGGACGACTACACCAGCAGGGATGCCCTCGATGTGT GGGGCCAGGGAACTGGTACCGTTACCTTC
50	DNA	AGCTATGGCATGCAC
51	DNA	GCCATCGGCACAGGCCGATACTACTATGCCGATAGCGTGATGGG C
52	DNA	AGGGACGACTACACCAGCAGGGATGCCCTCGATGTG
53	DNA	CAGTCCTGACACAGCCTCCAGCGCTCTGGCACACCTGGACA GAGAGTGGACCATCAGCTGTAGCGGCAGCAGCTCAACATCGGCAGC AACACCGTGAACGTTATCAGCAGCTGGCACAGGCCCTAAACT GCTGATCTACTACGACGACCTGCTGCCAGCGCGTGGCCGATAGAT TTTCTGGCAGCAAGAGCGCACAAAGGCCAGCCTGCGTATCTCTGGA CTGAGAGATCTGAGGACGAGGCCGACTACTATTGCCCGCCCTGGGACGA TAGCCTGAACGGCTATGTGGTTTCCGGGGAGGACCAAGCTGACCG TGCTA
54	DNA	AGCGGCAGCAGCTCAAACATCGGCAGCAACACCGTGAAC
55	DNA	TACGACGACCTGCTGCCCTAGC
56	DNA	GCCGCCTGGGACGATAGCCTGAACGGCTATGTGGTT
57	PRT	EVQLESGGGLVQPQPGSLRLSCAASGFTFSSYGMHWVRQAPGKLEWV SAIGTGGDTYYADSVMRFTISRDNNSKNTLYLQMNSLRAEDTAVYYCA RRADDYTSRDAFDVWGGTIVTSSASTKGPSVFPLAPSSKSTSGGTAAL GCLVKDVFPEPVTVWSNSGALTSGVHTFPAVLQSSGLYSLSVVTPVSSS LGTQTYICNVNHPKSNTKVDKVKVEPKSCDKTHTCPCPAPELLGGPSVFL FPPKPDKDTLMISRTEPVTCVVVDVSHEDPVEKFVNWYVDGVEVHNATK PREEQYNSTYVVSVLTVLHQDWLNGKEYKKVSNKALPAPIEKTIKA KGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCVMHEALHNHY TQKSLSLSPG
58	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNISNTVNWYQQLPGTAKLIIY DDLLPSGPDRFSGSKSGTASLAISGLRSEDEADYYCAAWDDSLNGYV VFGGGTKLTVLGQPKAAPSVTFPPSSEELQANKATLVCLISDFYPGAVT VAWKADSPVKAQVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
59	DNA	GAAGTTCAAGCTGCTGGAATCTGGCGGCCGACTGGTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCGCCAGCGCCCTTACCTTTAGCAGCT ATGGCATGCACTGGGTCCAGACAGGCCCTGGCAAAGGACTTGAATGG GTGTCGGCCATCGGCACAGGGCGATACCTACTATGCCGATAGCGT GATGGGCAAGATTACCATCAGCGGGACAACAGCAAGAACACCCCTG TACCTGCAGATGAACACGCTGAGAGCCGAGGACACCGCCGTGACTA TTGCGCCAGAAGGGACGACTACACAGCAGGGATGCCCTCGATGTGT GGGGCCAGGGAAACACTGGTTACCGTTCTTCAGCCAGCACCAAGGGC CCCAGCGTGTCCCTCTGGCCCCTAGCAGCAAGAGCACATCGCCG AACAGCGCCCTGGGTGCTGTAAGGACTACTTCCCGAGGCCG TGACCGTGTCTGGGACTCTGGGCTCTGACAAGCGGCCGTGACACC TTTCCACCGCTGCTGAGCAGCAGCGCCCTGACTCTCTGAGCAGGGT CGTGACAGTGCCTCAGCAGCTCTCTGGCACCCAGACCTACATCGCA ACGTGAACCCAAGGCCAGAACACCAAGGTGGACAAGGAAGGTGGA ACCCAAGAGCTGCAACAGACCCACACCTGTCCCCCTGTCTGGCC CCGAACCTGCTGGGAGGCCCTCCGTGTTCTGTGTTCCCCCAAAGCCCA AGGACACCCCTGATGATCAGCGGGACCCCGAAGTGAACCTGCGTGGTG GTGGATGTGTCCTCAGAGGGACCTGAAAGTGAAGTTCAATTGGTAGCT GGACGGCTGGAAGTGCACAACGCCAACAGCCAAGGCTAGAGAGGAA CAGTACAACAGCACCTACCGGGTGGTGTCCGTGCTGACAGTGTGCA CCAGGACTGGCTGAACGCCAACAGAGTACAAGTGAAGGTGTCAC AAGGCCCTGCTGCCCTCGAGAAAACCATCAGCAAGGCCAAGG GCCAGCCCCGCCGAACCCAGGTGTACACACTGCCCTCAAGCAGGGAC GAGCTGACCAAGAACAGGTGCTCTGACTGTCTCGTGAAGGGTT CTACCCCTCCGATATCGCCGTGGAAATGGGAGAGCAACGCCAGGCCG AGAACAACTACAAGGCCACCCCTGTGCTGGACAGCGACGGCTCA TTCTTCTGTACAGCAAGCTGACCGTGACAAGTCCCGTGGCAGCA GGGCAACGTGTTCACTGAGCTGAGCGTGATGACGAGGCCCTGCA ACTACACCCAGAAGTCCCTGAGCCCTGAGCCCTGG

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
60	DNA	CAGTCTGTTCTGACACAGCCTCCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGCAGCAGCTCCAACATCGGCAGC AACACCGTGAACTGGTATCAGCAGCTGCCAGCAGCCCCCTAAACT GCTGATCTACTACGACGACCTGCTGCCAGCGCTGCCGATAGAT TTTCTGGCAGCAAGAGCGGACAAGGCCAGCCCTGGCTATCTCTGGA CTGAGATCTGAGGACGGGCGACTACTATTGCGCCGCCCTGGGAGCA TAGCCTGAAACGGCTATGGTTTCGGCGGAGGACCCAGCTGACCG TGCTAGGCCAGCCTAAAGCCGCCCTAGCGTGACCTGTCCCTCCA AGCAGCGAGGAACATGCAGGCCAACAGGCCACCCCTGTCGCTGAT CAGCGACTTCTATCTGGCGCCGTGACCGTGGCTTGGAAAGGCCGATA GCTCTCTGTGAAGGCCGGCGTGGAAACCAACCCCTAGCAAGCAG AGCAACAAATAACGCCAGCAGCTACCTGAGCCTGACCCCCGA GCAGTGGAAAGTCCCACAGATCTACAGCTGCCAAGTGACCCACGAGG GCAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGAGCAGC
61	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYEMNWVRQAPGKLEWV SGISWNNGSIGYADSVKGRFTISRDN SKNTLYLQMNSLRAEDTAVYYCA RSGYSSWFDPDFDYWGQGTLVTVSS
62	PRT	SYEMN
63	PRT	GISWNNGSIGYADSVKG
64	PRT	SGYSSWFDPDFDY
65	PRT	QSVLTQPPSASGTPGQRVTISCTGSSNIAGYDVHWYQQLPGTAKLLI YGNNSNRPSGVDRFSKSGTSASLAISGLRSEDEADYYCSSYAGSNPYV VFGGGTKLTVL
66	PRT	TGSSSNIGAGYDVH
67	PRT	GNSNRPS
68	PRT	SSYAGSNPYVV
69	DNA	GAAGTTCAAGCTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCCCTTACACCTTAGCAGCT ACGAGATGAACGGGTCGACAGGCCCTGGCAAGGCCCTGAATG GGTGTGGGACATCAGCTGGAAATAGCGCTCTATCGGCTACGCCGACA GCGTAAGGGCAGATTACCCATCAGCCGGACAAACAGCAAGAACAC CCTGTACCTGCAGATGAAACACGCTGAGAGCGGAGGACACGCCGTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTTGGTTGACCCGAC TTCGACTATTGGGCCAGGGCACACTGGTCACAGTCTCTCA
70	DNA	AGCTACGAGATGAAC
71	DNA	GGCATCAGCTGGAATAGCGGCTCTACGGCTACGCCAGCGTGAA GGGC
72	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT
73	DNA	CAGTCTGTTCTGACACAGCCTCCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTACCGCAGCAGCTCCAATATCGGAGCG GCTATGACGTGCACTGGTATCAGCAGCTGCCAGCAGCCCTAAAC CTGCTGATCTACGGCAACAGCAACAGGCCAGCGCGCTGGCTATCTCG ATTTCCGGCTTAAGAGCGGCCACAAGCGCCAGCCTGGCTATCTCG GACTGAGATCTGAGGACGAGGCCGACTACTACTGCAAGCTATGCC GGCAGCAACCCCTACGTGTGTTGGCGGAGGACCAAGCTGACCGT TCTA
74	DNA	ACCGGCAGCAGCTCAAATACGGAGCCGGCTATGACGTGCA
75	DNA	GGCAACAGCAACAGACCCAGC
76	DNA	AGCAGCTATGCCAGCAGCAACCCCTACGTGTG
77	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYEMNWVRQAPGKLEWV SGISWNNGSIGYADSVKGRFTISRDN SKNTLYLQMNSLRAEDTAVYYCA RSGYSSWFDPDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYLFPPEPVTVWSNNSGALTSGVHTFPPLAVLQSSGLYSLSSVVTVP

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		SSSLGTQTYICNVNHPKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPKPCKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHN KTKPREEQYNTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT SKAQGPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNG QPNENYKTTPPVVLDSGSFFLYSKLTVDKSRWQQGNVFCSVMHEALH NHYTQKSLSLSPG
78	PRT	QSVLTQPPSASGTPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSNRPSGVDPDRFSGSKSGTSASLAISGLRSEDEADYYCFSYAGSNPVY VFGGTCKLTVLGQPKAAPSVTFLPFSSEELQANKATLVCLISDFYPGAVT VAWKADSPVKAQVETTPSKQSNNKYAAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
79	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCAGCGGCCCTGGCAAAGGCCCTTGAAATG ACGAGATGAACCTGGGTCCGACAGGCCCTGGCAAAGGCCCTTGAAATG GGTGTCCGGCATCAGCTGGAAATAGCGCTCTATCGGCTACGCCGACA GCGTGAAGGGCAGATTACCATCAGCCGGACAACAGCAAGAACAC CCTGTAACCTGAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCCAGAAGGCCCTACAGCAGCTCTTGTTTGACCCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTCTCAGCCAG CACCAAGGGCCCAGCGTGTCCCTCTGGCCCTAGCAGCAAGAGCA CATCTGGCGAACAGGCCCTGGCTCGTGAAGGACTACTTT CCCGAGCCCGTGAACCTGGAAACTCTGGCGCTCTGACAAGACGG CGTGCACACCTTCCAGCCGTGCTCGAGAGCAGCCGCTGTACTCTC GAGCAGCGTGTGACAGTGGCCAGCAGCTCTGGCACCCAGACCT ACATCTGCAACAGTGAACCAAGCACAAGGCCAGCAACACCAAGGTGGACAA GAAGGTGGAACCCAAGGCTGCGACAAGGCCAACACTGTCCCCCTT GTCTGCCCCGAACTGCTGGGAGGCCCTCCGTGTTCCCTGTTCCCC CAAAGCCAAGGACACCCGTGATGATCAGCCGACCCCCGAAGTGA CTGCGTGTGGATGTGTCACAGGACCTGAAAGTGAAGGTCA ATTGGTACGTGGACGGCTGGAAAGTGCACAAACGCCAACAGCAAGGCC TAGAGAGGAACAGTACAACAGCACCTACCGGGTGGTGTCCGTGCTGA CAGTGTGCAACAGGACTGGCTGAAGGAAAGACTACAAGTGA GGTGTCCAACAAGGCCCTGCTGCCCATCGAGAAAACCATCAGCA AGGCCAACGGGAGCCAGGCCAACCCAGGTGTACACACTGCC AGCAGGGACAGACTGACCAAGAACAGGTGTCCCTGACCTGTCTCGT GAAAGGCTTCTACCCCTCGATATCGCCGTGGAATGGAGAGCA GCCAGCCCGAGAACAACTACAAGACCACCCCCCTGTGCTGGACAGC GACGGCTCATTTCTCGTACAGCAAGCTGACCCGAGGAAAGTCCCG GTGGCAGCAGGGCAACGTGTTCACTGCAAGCGTGTGACGAGGCC TGCACACCAACTACACCCAGAACAGTCCCTGAGCCTGAGCCCTGGC
80	DNA	CAGTCTGTTCTGACACAGCCTCTAGCGCCTCTGGCACACCTGGACA GAGAGTGAACCATCAGCTGTACCGGCAGCAGCTCAATATCGGAGCCG GCTATGACGTGCACTGGTATCAGCAGCTGCTGGCACAGCCCCATAA CTGCTGATCTACGGCAACAGCAACAGACCCAGCGCGCTGCCGATAG ATTTTCCGGCTCTAAGAGGCCAACAGGCCAGCCTGGCTATCTCTG GACTGAGATCTGAGGAGGCCGACTACTACTGCGACAGCTATGCC GGCAGCAACCCCTACCGTGTGTTGGGGAGGCACCAAGCTGACCGT TCTAGGCCAGCCTAACAGGCCCTAGCGTGTGACCCCTGTTCCCTCCAA GCAGCGAACAGACTGAGGCCAACAGGCCACCCCTGTGCTGCCGTGATC AGCGACTTCTACCTGGCCCGCTGGAGCGTGGCCCTGGAGGCCGATAG CTCTCGTGTGAAGGGCGCGTGGAAACCCACCCCTAGCAAGCAGA GCAACACAAATACGCCGCCAGCAGCTACCTGAGCCTGACCCCGAG CAGTGGAAAGTCCCACAGATCTACAGCTGCCAAGTGAACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
81	PRT	EVQLLESGGGLVQTGGSLRLSCAASGFTFSDYAMSVRQAPGKGLEWV SWIYYDGSKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC AKLNGDFDYWGQGTLTVSS
82	PRT	DYAMS
83	PRT	WIYYDGSKYYADSVKG
84	PRT	LNGDFDY
85	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGNNNDVSWYQQLPGTAPKLLIY ADSHRPSGVDPDRFSGSKSGTSASLAISGLRSEDEADYYCGAWDSSLGY VFGGTCKLTVL

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No.	SEQ Type	SEQUENCE
86	PRT	SGSSSNIGNNDVS
87	PRT	ADSHRPS
88	PRT	GAWDSSLGYV
89	DNA	GAAGTTCACTGCTGGAAATCTGGCGCCGACTGGTCAAACAGGGCG CTCTCTGAGACTGAGCTGTGCCCTCTGGCTTACCTTCAGCGATT CGCCATGAGCTGGTCCGACAGGCCCTGGAAAAGGCCTGAATGGG TGTCTCTGATCTACTACAGCAGCGCAGCAAGTACTACGCCGACAGC GTGAAGGGCAGATTCCACCATCAGCGGGACAACAGCAAGAACACCC TGTACCTGCAGATGAACAGCTGAGAGCCGAGGACACCGCGTGTAC TATTGCGCCAAGCTGAACCGCGACTTCGACTATTGGGCCAGGGCAC ACTGGTCACAGTCTTC
90	DNA	GATTACGCCATGAGC
91	DNA	TGGATCTACTACGACAGCGGAGCAAGTACTACGCCGACAGCGTGAA GGGC
92	DNA	CTGAACGGCGACTTCGACTAT
93	DNA	CAGTCTTCTGACACAGCCTCTAGCGCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGAGCAGCTAACATCGGAAAC AACGACGTGCTCTGGTATCAGCAGTGCCTGGCACAGCCCCTAAACT GCTGATCTACGCCGACAGCCACAGACTAGCGGCGTGGCAGATAGAT TCAGCGCTCTAAGAGGGCACATCTGCCAGCCTGGCATCTCTGGA CTGAGATCTGAGGACGAGGCCGACTACTATTGCGGCCCTGGGATTC TAGCCTGAGCGGCTATGTTTGGCGAGGCACCAAGCTGACCGTGC TA
94	DNA	AGCGGCAGCAGCTCAAACATCGCAACACAGACGTGTCC
95	DNA	GCCGACAGCCACAGACCTAGC
96	DNA	GGCCGCTGGATTCTAGCCTGAGCGCTATGTT
97	PRT	EVQLLESGGGLVQTVGGSLRLSCAASGFTFSDYAMSWVRQAPGKLEWV SWIYYDGSKYAADSVGRFTISRDNSKNLTYLQMNSLRAEDTAVYYC AKLNGDFDYWGQGTLTVVSSASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSVVTVPSSSLGTQ TYICVNHKPSNTKVDKVKVEPKSCDKTHCTCPCCPAPELGGPSVFLPPK PKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVGVEVHNAKTKPREE QYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIETISKAKGQ PREPQVTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWSNGOPENNY KTPPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQK SLSLSPG
98	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGNNDVSWYQQLPGTAPKLLIY ADSHRPSGPDRFSGSKSGTSASLAISSLRSEDEADYYCGAWDSSLG VFGGGTTLTVLGQPKAAPSVTLPFPPSSEELQANKATLVCLISDFYPGAVT VAWKADSPVKAQVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
99	DNA	GAAGTTCACTGCTGGAAATCTGGCGCCGACTGGTCAAACAGGGCG CTCTCTGAGACTGAGCTGTGCCCTCTGGCTTACCTTCAGCGATT CGCCATGAGCTGGTCCGACAGGCCCTGGAAAAGGCCTGAATGGG TGTCTCTGATCTACTACAGCAGCGCAGCAAGTACTACGCCGACAGC GTGAAGGGCAGATTCCACCATCAGCGGGACAACAGCAAGAACACCC TGTACCTGCAGATGAACAGCCTGAGAGCCGAGGACACCGCGTGTAC TATTGCGCCAAGCTGAACGGGACTTCGACTATTGGGCCAGGGCAC ACTGGTCACAGTCTTCAGCCAGCACCAAGGGCCCCAGCGTGTCC CTCTGGCCCTAGCAGCAAGAGCACATCTGGCGAACAGCGGCCCTG GGCTGCTCTCGTGAAGGACTACTTCCGAGCCCGTGACCCGTGTCTG GAACCTGGCGCTCTGACAAGCGGGCTGCACACCTTCCAGCCGTGC TGCAGAGCAGCGGCCGTACTCTCTGAGCAGCGTGTGACAGTGC AGCAGCTCTGGCACCCAGCCTACATCTGCAACGTGAACCAAA GCCAGCAACACCAAGGTGGACAAGAAGGTGGAAACCCAAGAGCTGC GACAAGACCCACACCTGCCCCCTTGTCCCTGCCCCCGAAGTGTGG AGGCCCTCCGTGTTCTGTTCCCCCAAGGCCAAGGACACCCCTGAT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GATCAGCGGGACCCCGGAAGTGCACCTGCGTGGTGGATGTGTCCC ACGGAGGCCCTGAAGTGAAGTTCAATTGGTACGTGGACGGCGTGG AGTGCACAAACGCCAACGCAAGCCTAGAGAGGAACAGTACAACAGC ACCTACGGGTGGTGGTGGCTGCTGACAGTCGCTGCACCAAGGACTGGCT GAACGGCAAAGAGTACAAGTGAAGGTGTCACAAGGCCCTGCCT GCCCCCATCGAGAAAACCATCAGCAAGGCCAACGGGCCAGCCCCGG AACCCCAGGTGTACACACTGCCCCCAAGCAGGGACGAGCTGACCAA GAACCAGGGTGTCCCTGACCTGTCCTGTAAGGCTTCTACCCCTCCG ATATGCCGTGGAATGGAGAGCACGGCAGGCCAGGAACA CAAGACCAACCCCCCTGTCGTCGACAGCGCACGGCTATTCTTCTG ACAGCAAGCTGACCGTGACAAGTCCCGTGGCACAGGGCAACAGT GTTCACTGCAAGCGTGTGATGCACGAGGCCCTGCACAACCACTACACCC AGAAGTCCCTGAGCCTGAGCCCTGGC
100	DNA	CAGTCTGTTCTGACACAGCCTCTAGGCCCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCCAACATCGGCAAC AACGACGTGCTGTAGCTGATCAGCAGCTGCCCTGGCACAGGCCCTAAACT GCTGATCTACGCCAGACGCCAGACACTAGCGCGTGGCAGATAGAT TCAGCGCTCTAAGAGGGCACATCTGCCAGCCTGGCATCTCGA CTGAGATCTGAGGAGCAGGGCGACTACTATTGCGGCCCTGGGATTC TAGCCCTGAGCGGCTATGTTTTGGCGAGGCCAACAGCTGACCGTGC TAGGCCAGCCTAAAGCCGCCCTAGCGTGCACCTGTTCCCTCCAAGC AGCGAGGAACCTGAGGCCAACAGGCCACCCCTCGTGTGCGTGTAG CGACTCTATCTGGCCCGTGACCGTGGCTGGAGGCCAGATAGCT CTCCTGTGAAGGCCGGCTGGAAACCAACCCCTAGCAAGCAGAGC AACAAAAATACTGCCGCCAGCAGCTACCTGAGCCTGACCCCGAGCA GTGGAAGTCCCACAGATCCTACAGCTGCCAAGTGCACGAGGGCA GCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
101	PRT	EVQLESGGGLVQPQPGSLRLSCAASGTFSSYEMNWRQAPGKGLEWV SGISWNSSIGYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RSGYSSWFDPDFDYWGQGTLVTVSS
102	PRT	SYEMN
103	PRT	GISWNSSIGYADSVKG
104	PRT	SGYSSWFDPDFDY
105	PRT	QSVLTQPPSVSGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSNRPSGVPDFSGSKSGTSASLAITGLQAEDDEADYYCSSYAGSNPY VVFGGGTKLTVL
106	PRT	TGSSSNIGAGYDVH
107	PRT	GNSNRPS
108	PRT	SSYAGSNPYVV
109	DNA	GAAGTTCTAGCTGCTGGAATCTGGCGGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTACCTTTAGCAGCT ACGAGATGAACGGGTCGCAAGGCCCTGGCAAAGGCCCTGAATG GGTGTCCGGCATCAGCTGAATAGCGGCTTATCGGCATCGCCGACA GCGTGAAGGGCAGATTACCATCAGCGGGACAACAGCAAGAACAC CCTGTACCTGAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGGCCAGGGCACACTGGTCACAGTCTCTTCA
110	DNA	AGCTACGAGATGAAC
111	DNA	GGCATCAGCTGGAATAGCGGCTCTATCGGCTACGCCAGCGTGAA GGC
112	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
113	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGGCCCTGGACAG AGAGTGACCATCAGCTGTACAGGCAGCAGCTCCAAATATCGGAGCGG CTATGAGCTGCACTGGTATCAGCAGCTGGCTGGCACAGGCCCTAAAC TGCTGATCTACGGCAACAGCAACAGCCCAGCGGCTGGCGATAGA TTTCGGCTTAAGAGCGGCAACAGCCAGCTGGCTTACTGGTCTAGCGG ACTGCAGGCCAGGGACGAGGCCACTACTGTCTAGCTACGCCG GCAGCAACCCCTACGTGGTTGGCGAGGCACCAAGCTGACAGTT CTA
114	DNA	ACAGGCAGCAGCTCAAATATCGGAGCCGGCTATGACGTGCAC
115	DNA	GGCAACAGCAACAGACCCAGC
116	DNA	TCTAGCTACGCCGGCAGCAACCCCTACGTGGTG
117	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYEMNWVRQAPGKLEWV SGISWNNGSISGYADSVKGRFTISRDNSKNLTYLQMNSLRAEDSTAVYCA RSGYSSWFDPDFDYWGQGLTVVSSASTKGPSVPPLAPSSKSTSGGT ALGCLVKDYYFPEPVTVWSNSGALTSGVHTFPAPVLQSSGLYSLSVVTV SSSLGQTQYICNVNHPKSNTKVDKKVEPKSCDKTHTCPCPAPELLGGPS VFLFPKKPKDTLMISPTPEVTCVVVDVSHEDPEVKENWVYDGVEVHNA KTKPREEQYNSTYRVVSVLVLHQDWLNGKEYKCKVSNKALPAPIEKI SKAKGQPQREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESEN QPNENYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMEALH NHYTQKSLSLSPG
118	PRT	QSVLTQPSPVSGAPGQRVTISCTGSSNIAGYDVHWYQQLPGTAKILLI YGNNSRNSPGVDRFSGSKSGTSASLAITGLQAEDBADDYCSSYAGSNPY VVFGGGTQLTVLGQPKAPSVTLFPPSSEELQANKATLVCLISDFYPGAV TVAWKADSSPVKAGVETTTPSKQSNNKYAASSYSLTPEQWKSHRSYS CQVTHEGSTVEKTVAPTECS
119	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCTTACACCTTAGCAGCT ACGAGATGAACGGGTCGACAGGCCCTGGCAAAGGCCCTGAATG GGTGTGGCATCAGCTGGAAATAGCGCTCTATCGGCTACGCCGACA GGCTGAAGGGCAGATTCAACCATCACCCGGACAACAGCAGAACAC CCTGTAACCTGAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCCAGAAGCCGCTACAGCAGCTTGGTTGACCCCGAC TTCGAGTATTGGGGCAGGGCACACTGGTACACAGTCTCTCAGGCCAG CACCAAGGGCCCGAGCTGGCTGGCCCTAGCAGCAAGAGCA CATCTGGCGAACAGCCCTGGCTCGTGAAGGACTACTTT CCCGAGCCGTGACCGTGTCTGGAACTCTGGCGCTCGACAAGCGG CGTGCACACTTCCAGCCGTGCTGAGCAGCCGCTGTACTCTCT GAGCAGCGTGTGACAGTGGCCAGCAGCTCTGGCACCCAGACCT ACATCTGCAACGTGAACACAAGCCAGAACACCAAGGTGGACAA GAAGGTGGAACCCAAGAGCTGCGACAAGACCCACACCTGTCCCC GTCCTGCCCCGAACTGCTGGGAGGCCCTTCGTGTTCTGTGTTCCCC CAAAGCCCAAGGACACCTGTGATGACCGGGACCCCGAAGTGA CTGCGTGGTGGATGTGTCCCAGGAGCCCTGAAGGTGAAGGTTCA ATTGGTACGTGGACGGCGTGGAAAGTGCACAACGCCAACAGAC TAGAGAGGAACAGTACAACAGCACCTACCGGGTGGTGTCCGTG CACTGCTGACACAGGACTGGCTGAACGGAAAGAGTACAAGTGC GGTGTCCAACAAAGGCCCTGCTGCCCTACATGAGAAAACCATCAGCA AGGCCAAGGGCCAGCCCCCGAACCCAGGTGTACACACTGCC AGCAGGGACGAGCTGACCAAGAACCCAGGTGTCCCCTGACCTGT GAAAGGCTCTACCCCTCCGATATCGCCGTGGAATGGGAGAGCAAC GCCAGCCCAGAACACTAACAGAACCCCCCTGTGGTGGACAGC GACGGCTATTCTCCGTGACAGCAAGCTGACCGTGATGCACGG GTGGCACGGCAACGTGTTGAGCTGACGGTGATGCACGG TGCACAACCAACTACACCCAGAACGCTGACGCCCTGAGGCC TGGC
120	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGGCCCTGGACAG AGAGTGACCATCAGCTGTACAGGCAGCAGCTCCAAATATCGGAGCGG CTATGAGCTGCACTGGTATCAGCAGCTGGCTGGCACAGGCCCTAAAC TGCTGATCTACGGCAACAGCAACAGCCCAGCGGCTGGCGATAGA TTTCGGCTTAAGAGCGGCAACAGGCCAGCTGGCTTACTGGTCTAGCTACGCCG ACTGCAGGCCAGGGACGAGGCCACTACTGTCTAGCTACGCCG GCAGCAACCCCTACGTGGTTGGCGAGGCACCAAGCTGACAGTT CTAGGCCAGCTAAAGCCGCCCTAGCGTGACCCCTGTTCCCTCAAG CAGCGAGGAACATGCGACGGCAACAAAGGCCACCCCTGCTG TGCCTGATCA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GCGACTTCTATCCTGGCCCGTGACCGTGGCCTGGAAGGCCGATAGC TCTCCTGTGAAGGCCGGCTGGAAACCACCCACTAGCAAGCAGAG CAACACAAAATACGCCGCCAGCAGCTACCTGAGCCTGACCCCCGAGC AGTGGAAAGTCCCACAGATCCTACAGTGCCAAGTGACCCACGGGGC AGCACCGTGGAAAAGACAGTGCCCCCTACCGAGTCAGC
121	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWV SAIGTGGDTYYADSVKGRFTISRDN SKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGTIVTVSS
122	PRT	SYAMS
123	PRT	AIGTGGDTYYADSVKG
124	PRT	RDDYTSRDAFDY
125	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDL RPSPGVDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNGYV VFGGGTKLTVL
126	PRT	SGSSSNIGSNTVN
127	PRT	YDDL RPS
128	PRT	AAWDDSLNGYVV
129	DNA	GAAGTTCAAGCTGCTGGAATCTGGCGGGACTGGTCAACCTGGCG ATCTGAGACTGAGCTGTGCCAGCGCCTTACCTTTAGCAGCT ACGCCATGAGCTGGCTCGACAGGCTCTGGCAAAGGCCCTGAATGG GTGTCCGCCATTGGCACAGCGGCATACTACTACAGCGACTCTGT GAAGGGCAGATTACCATCAGCGGGACAACAGCAAGAACACCCCTG TACCTGAGATGAACAGCCTGAGAGCCGAGGACACCGCCGTGTACTA TTGCGCCAGAAGGGACACTACACCAGCAGGGACGCCCTCGATTATT GGGGCCAGGGCACACTGGTACCGCTTCA
130	DNA	AGCTACGCCATGAGC
131	DNA	GCCATTGGCACAGGCCGATACCTACTACGCCACTCTGTGAAGGG C
132	DNA	AGGGACGACTACACCAGCAGGGACGCCCTCGATTAT
133	DNA	CAGTCTGTTCTGACACAGCCTCTAGGCCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGCAGCAGCTCCACATCGGCAGC AACACCGTGAACCTGGTACAGCAGCTGCCAGGCCCTAAACT GCTGATCTACTACGACGACCTGCGGCCCTAGCGCGCTGCCAGATAGAT TTTCTGGCAGCAAGAGCGGCACCTCTGCCAGCCTGGCTATTCTGGA CTGCGAGCGAGGACGAGGCGACTATTATTGTGCCGCTGGGACGA CAGCCTGAACGGCTATGTTTCCGGCGAGGACCAAGCTGACCG TTCTA
134	DNA	AGCGGCAGCAGCTCCACATCGGCAGCAACACCGTGAAC
135	DNA	TACGACGACCTGCCCTAGC
136	DNA	GCCGCCTGGGACACGCCCTGAACGGCTATGTTGTT
137	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWV SAIGTGGDTYYADSVKGRFTISRDN SKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGTIVTVSSASTKGPSPVFLAPSSKSTSGGTAAL GCLVKDFPPEPVTSWNSGALTSGVHTFPAVLQSSGLYSLSVVTVPSS LGTQTYICNVNHHKPSNTKVDKVKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPPKPDLMISRTPEVTCVVVDVSHEDPEVKFNWYDGVEVHNAKTK PREEQYNSTYRVSVLVLHDWLNGKEYCKVSNKALPAPIEKTK KGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVVLDSGSSFLYSLKTVDKSRWQQGNVFSCVMHEALHNHY TQKSLSLSPG
138	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDL RPSPGVDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNGYV VFGGGTKLTVLQGQPKAAPSVTFPPSSEELQANKATLVCLISDFYPGAVT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
139	DNA	VAWKADSSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSRSYSC QVTHEGSTVEKTVAPTECS
140	DNA	GAAGTTCAGCTGCTGGAAATCTGGCGGGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTCACCTTAGCAGCT ACGCCATGAGCTGGGTCGACAGGCTCTGGCAAGGGCTTGAAATGG GTGTCAGCTGGCACAGGGCGATACCTACTACGGCGACTCTGT GAAGGGCAGATTCCACCATCAGCGGGACAAGCAAGAACACCTG TACCTGCAGATGAACAGCCTGAGAGCGGAGGACACGGCGTGTACTA TTGCGCCAGAAGGGACGACTACACCAGCAGGGACGCCCTTGATTATT GGGGCAGGGCACACTGGTACCGTTCTTCAGCCAGCACCAAGGGC CCCAGCGTGTCCCTCTGGGCCCCTAGCAGCAAGAGCACATCTGGCGG AACAGCGGCTGGGCTGCTCGTAAGGACTACTTCCCGAGCCCCG TGACCGTGTGGAAACTCTGGCGCTCTGACAAGCGGCGTGCACACC TTCCACCGCTGCTGAGAGCAGCGGCCCTGTACTCTGTAGGCAGGCT CGTGCACAGTGCAGCAGCTCTGGCACCCAGACCTACATCTGCA ACGTGAACCCAAGGCCAGAACACCAAGGTTGACAAGGAAGGTGGA ACCCAAGAGCTGCGACAAGACCCACACTGTCCCCCTGTCTGCC CCGAACGCTGGGAGGGCCCTCCGTGTCTCTGTTCCCCCAAAGGCCA AGGACACCCCTGATGATCAGCGGGACCCCGAAGTGACCTGCGTGGTG GTGGATGTGCCCCACAGGGACCCCTGAAGTGAAAGTTCAATTGGTAGT GGACGGGTGGAAGTGACAACGCCAACAGCTAGAGGAGAA CAGTACAACACGACCTACCGGGTGGTGTCCGTGACAGTGCTGCA CCAGGACTGGCTGAACGGCAAAGAGTACAAGTGCAAGGGTGTCCAAC AAGGCCCTGCTGCCCATCGAGAAAACCATCAGCAAGGCCAAGG GCCAGCCCCCGGAACCCCAAGGTGTACACACTGCCCAAGCAGGGAC GAGCTGACCAAGAACAGGTGTCCCTGACCTGTCTGTGAAAGGCTT CTACCCCTCCGATATGCCGTGGATGGAGAGCAACGGCCAGGGCG AGAACAACTACAAGACCAACCCCCCTGTGCTGGAGACCGACGGCTCA TTCTCTGTACAGCAAGCTGACCGTGGACAAGTCCGGTGGAGCA GGGCAACGTGTTCACTGCGTGTGACGAGGCCCTGCACAACC ACTACACCCAGAAGTCCCTGAGCCTGAGCCCTGGC
141	PRT	EVQLLESGGGLVQPQGSRLSLCAASGFTFYSYAMSWVRQAPKGLEWV SAIGTGGDTYYADSVKRFITISRDNSKNTLYLQMNSRAEDTAVYYCA RRDDYTSRDAFDYWQQGLTVVSS
142	PRT	SYAMS
143	PRT	AIGTGGDTYYADSVKG
144	PRT	RDDYTSRDAFDY
145	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAKPLIYY DDLRLPSPVPDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNDYV VFGGGTKLTVL
146	PRT	SGSSSNIGSNTVN
147	PRT	YDDLRPS
148	PRT	AAWDDDSLNDYVV
149	DNA	GAAGTTCAGCTGCTGGAAATCTGGCGGGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTCACCTTTACAGCTA CGCCATGAGCTGGTCCGACAGGCCCTGGAAAAGGCCCTTGAAATGGG

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		TGTCCGGCATCGGCACAGGCGCGATACCTACTATGCCGACTCTGTG AAGGGCAGATTCAACCATCAGCGGGAACACAGCAAGAACACCCCTGT ACCTGCGATGAACAGCTCTGAGAGCCGAGGACACCGCCGTTGACTAT TGCGCCAGAAGGGACGACTACACCCAGCAGGGACGCCCTCGATTATTG GGGCCAGGGCACACTGGTCACCGTTCA
150	DNA	AGCTACGCCATGAGC
151	DNA	GCCATCGGCACAGGCGCGATACCTACTATGCCGACTCTGTGAAGGG C
152	DNA	AGGGACGACTACACCAGCAGGGACGCCCTCGATTAT
153	DNA	CAGTCTGTTCTGACACAGCCTCTAGGCCCTCTGGCACACCTGGACA GAGAGTGGACCATCAGCTGAGCGCAGCTCCAACATCGGCAGC AACACCGTGAACCTGGTATCAGCAGCTGCCAGGGCCAGGCCCCTAAACT GCTGATCTACTACGACGACCTGCGGCCCTAGCGGCCAGATAGAT TTCTGGCAGCAAGAGCGGCACCTCTGCCAGCGCTGGCTATTCTGGA CTGCAGAGCGAGGACGAGGGCGACTATTATTGTGCCGCTGGGACGA CAGCCTGAACGACTACGTTGTTGGCGGAGGACCAAGCTGACCG TTCTA
154	DNA	AGCGGCAGCAGCTCCAACATGGCAGCAACACCGTGAAAC
155	DNA	TACGACGACCTGCGGCCTAGC
156	DNA	GCCGCCTGGGACGACAGCCCTGAACGACTACGTTGTG
157	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFYSYAMSWVRQAPGKLEWV SAIGTGGDTYYADSVKGRFTISRDNSKNTLYLQMNLRAEDTAVYCA RRDDYTSRDAFDYWGQQLTVSSASTKGPSVFPLAPCSRSTSESTAAL GCLVKDYLFPPEVTWNSGALTGVHTFPAVLQSSGLYLSVSVTVPSS LGTKTYTCNVHDKPSNTKVDKRVESKGYPGPPCPAPEFLGGPSVFLFPP PKPDLMISRTPEVTCVVVDVSQEDPEVQFNWYDVGVEVHNAKTKPRE EQFNSTYRVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKQ PREPQVYTLPPSQEEMTKNQVSLTCLVKGFYPSDIAVEWESNGOPENNY KTPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHNHYTQK SLSLSLGK
158	PRT	QSVLTLQPPSASGTPGQRVTI SCGSSSNIGSNTVNWYQQLPGTAPKLIIY DDLRPSGPDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNDYV VFGGGTKLTVLGQPKAAPSVTLFPSSSEELQANKATLVCILSDFYPGAVT VAWKADSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
159	DNA	GAAGTTCACTGCTGGAATCTGGCGCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCACTTTACAGCTA CGCCATGAGCTGGCTGGACAGGGCCCTGGAAAAAGGCCTGTAATGG TGTCCGCCATCGGCACAGGGCGGATACCTACTATGCCGACTCTGTG AAGGGCAGATTCAACCATCAGCGGGAACACAGCAAGAACACCCCTGT ACCTGCGAGATGAACAGCTGAGAGCCGAGGACACCGCGTGTACTAT TGCAGCGAGAAGGGACGACTACACCAAGCAGGGACGCTTCGATTATTG GGGCCAGGGCACACTGGTCACCGTTCTAGCCAGCACAAAGGGCC CCAGCGTGTTCCTCTGGCCCTTGTAGCGAGAACGACTACTTCCGAGGCCGT GACCGTGTCTGGAACTCTGGCCTCTGACAAGCGGGCTGCACACCT TTCCAGCGCTGCTGAGAGCAGGGCTGTACTCTGAGCGCGT GTGACAGTGGCCAGCAGCAGCTGGGCACCAAGACCTAACCTGAA CGTGGACACAAAGCCCAGCAACACCAAGGTGGACAAGCGGGTGGAA TCTAAGTACGGCCCTCCCTGCCCTCTGCCAGCCCCTGAATTTCG GGCGGACCCCTCCGTGTTCTGTTCCCCCAAAGGCCAAGGACACCCCT GATGATCAGCCGGACCCCCGAAGTGAACCTGGGTGGTGATGTGT CCCAGGAAGATCCCGAGGTGAGCTCAATTGGTACGTGGACAGCGT GAAGTGACAACGCCAAGACAAGGCCAGAGGAAACAGTCAACA GCACCTACCGGGTGGTCCGTGACAGTGCTGCACCCAGGACTGG CTGAAGGCCAAGAGTACAAGTGAAGGTGTCACAAAGGGCCCTGC CCAGCTCATCGAGAAAACCATCAGCAAGGCCAAGGGCCAGGCC CGAACCCCAAGGTGACACTGCCCTCAAGCCAGGAAGAGATGACC AAGAACCCAGGTGCTCTGACCTGTCGTGAAAGGCTTCTACCCCTC CGATATCGCGTGGAAATGGAGAGCAACGCCAGCCCCGAGAACAAAC TACAAGACCAACCCCCCTGTGCTGGACAGCGACGGCTATTCTTCC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GTACAGCAGACTGACCGTGGACAAGAGCCGGTGGCAGGAAGGCAC GTGTTCACTGAGCGTGATGCACGAGGCCCTGCACAACCACAC CCAGAAGTCCCTGTCTGAGCCTGGCAAG
160	DNA	CAGTCTTCTGACACAGCCTCTAGCGCTCTGGCACACCTGGAC GAGAGTGAACATCAGCTGTAGCGGCAGCAGCTCAACATCGGCAGC AACACCGTAACTGGTATCAGCAGCTGCCCTGGCACAGCCCCCTAAACT GCTGATCTACTACGACGACCTGGCAGCTAGCGCGTGGCAGATAGAT TTTCTGGCAGCAAGAGCCGACCTCTGCCAGCCTGGCTATTCTGGA CTGCAGAGCAGGAGCAGGGCGACTATTATTGTGCCGCTGGGACGA CAGCCTGAACGACTACGGTGTGCGGAGGACCAAGCTGACCG TTCTAGGCCAGCTAAAGCGCCCTAGCGTGACCCCTGTTCCCTCCAA GCAGCGAGGAACCTGAGGCCAACAGGCCACCCCTGTGTGCGCTGATC AGCGACTTCTATCTGGCGCGTGACCGTGGCCTGGAGGCCGATAG CTCTCTGTGAAGGCCGGCGTGGAAACACCACCCCTAGCAAGCAGA GCAACAAATAACGCCGCCAGCAGCTACCTGAGCCTGACCCCGAG CAGTGAAGTCACAGATCTACAGCTGCCAAGTGAACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTCAGC
161	PRT	EVQLLESGGLVQPGGSLRLSCAASGFTFSSYAMSWRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTIISRDNSKNTLYLQMNLRAEDTAVYVCA RRDDYTSRDAFDYWGQQGLTVSS
162	PRT	SYAMS
163	PRT	AIGYGGDTYYADSVKG
164	PRT	RDDYTSRDAFDY
165	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAKLIIY DDLRLPSGPDRFSGSKSCTSASLAISLQLQSEDEADYYCAAWDDSLNDIV VFGGGTKLTVL
166	PRT	SGSSSNIGSNTVN
167	PRT	YDDLRPS
168	PRT	AAWDDDSLNDIVV
169	DNA	GAAGTTCAGCTGCTGGAAATCTGGCGCCGGAUTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGCTTCACTTTAGCAGCT ACGCCATGAGCTGGCTCGACAGGCTCTGGCAAAGGCCCTGAATGG GTGTCGCCATCGGCTATGGCGCGATACCTACTACGCCGACTCTGT GAAGGGCAGATTACCCATCAAGCGGACAACAGCAAGAACACCCCTG TACCTGCAAGATGAACAGCCTGAGAGGCCGAGGACACGCCGTGTACTA TTGCGCCAGAAGGGCAGACTACACAGCAGGGACGCCCTCGATTATT GGGGCCAGGGCACACTGGTCACCGTCTTC
170	DNA	AGCTACGCCATGAGC
171	DNA	GCCATCGGCTATGGCGGCATAACCTACTACGCCGACTCTGTGAAGGG C
172	DNA	AGGGACGACTACACCAGCAGGGACGCCCTCGATTAT
173	DNA	CAGTCTTCTGACACAGCCTCTAGCGCTCTGGCACACCTGGACA GAGAGTGAACATCAGCTGTAGCGGCAGCAGCTCAACATCGGCAGC AACACCGTAACTGGTATCAGCAGCTGCCCTGGCACAGCCCCCTAAACT GCTGATCTACTACGACGACCTGGCAGCTAGCGCGTGGCAGATAGAT TTTCTGGCAGCAAGAGCCGACCTCTGCCAGCCTGGCTATTCTGGA CTGCAGAGCAGGAGCAGGGCGACTATTATTGTGCCGCTGGGACGA CAGCCTGAACGACATCGTTGTTTGGCGGAGGACCAAGCTGACCG TTCTA
174	DNA	AGCGGCAGCAGCTCCAACATCGGCAGCAACACCGTGAAC
175	DNA	TACGACGACCTGCGGCCTAGC
176	DNA	GCCGCCTGGGACGACAGCCTGAACGACATCGTTGTT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
177	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYAMS WVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTI SRD NSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGT LTVTVSSA STKGPSVFPLAPCSRSTSESTAAL GCLVKD YFPEPVTVWSNSGALTSGVHTFP AVLQSSGLYSLSSVVTPVSSS LGTKTYC NVNDH KPSN TKV DKR VES KYGPPCP C PAPEFL GGP SVFL FPP KPKDTLMISRTPEVTCVVVDV S QED P E VQFNWYV DGV E VHNA KTKP R E EQFN SYTRV SVL TLV LH QDWLN GKEYKCKV S NKG LPSSIEKT KAKG Q PREP QVY TLPPS QEE MTKN QV S LT CLV KG FYP PSDIA VEWESNG Q PENNY KTPP VL DSDGSFFLYS RLT VDKSRW QEGNVFSC VMHEALHNHYTQ K SLSL S L GK
178	PRT	QS VLT QPPS A SGTPG QRV T I SC GSS S NI GS NT VN WY Q QLP GT A PKL LI YY DDL RP SGP VPDR FSG S KSGT SAS LA I S GL Q SEDE AD YY CA WDD S LND IV VFGGGT KTL TVLG QPKA AP S VTL FP P S S EEL QANKA T L VCL I SDF Y PG A VT VAWKAD S P V KAG VET TTPS K QSN NK YAA SS YLS L TP EQW KSH RSY SC QV THE G S T V E K T V A P T E CS
179	DNA	GAAGTT CAGCT GCT GGAAT CTGGCGCCG GACTGGTTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCGCCAGCGCTT CACCTTTAGCAGCT ACGCCATAGGCTGGGTCGACAGCTCC TGGCAAAAGGCCTTGATGG GTGT CGCCCATGGCTATGGCGG C ATACCTACTACGCCAGCTG GAAGGGCAGATT CACCATCAGCGGGACA CAGCAAGAACACCC TACCTG CAGATGAACAGCCTGAGAGCCGAGGACACCGCCGTGTA TTGCGCCAGAAGGGACGACTACACCAGCAGGGACGCCCTTGATT GGGGCCAGGGCACACTGGT CACCGT TTCTCAGCCAGCACCAAGGG CCCAGCGTGTCCCTCTGGCCCTTGAGCAGAACAGCAGCGAGTC TACAGCC CCTGGGCTGCCTCGTGAAGGACTACTTCCGAGGCC TGACCGTGTCTGGA ACTCTGCGCTCTGACAAGCGCGTGCACACC TTTCCAGCGGTGCTGAGCAGCGCCCTGTACTCTGAGCAGCGT CGT GAGCTGCCCAGCAGCCTGGCACC AACAGCTAACCTGTA ACGTGGACCACAAGCCAGAACACCAAGGTGGACAAGCGGGTGG ATCTAAGTACGGCCCTCCCTGCCCCTCTGCCCAGCCCTGGAATTTCT GGCGGAGCCCTCCCGTGTCTGT TCCCCCAAAGCCAAGGGACACCC TGATGATCAGCGGAGCCCGAAGTGACCTGCGTGTGGATGTG TCCCAGGAAGATCCCGAGGTGCA GTTCAATGGTACGTGGACGGCGT GGAAGTGCACAACGCCAGAACAGCCAGAGGAAACAGTTCAAC AGCACCTACCGGCTGGTCCGTGTCAGTGCACAGGACTG GCTGA CGGAAAGACTACAGTGCAAGGTGTCAACAAAGGGCTG CCCAGCTTACAGAGAAAACCATCAGCAAGGCCAGGGCCAGCCCC GCGAACCCAGGTGACACACTGCCTCCAAGCCAGGGAGAGATGAC CAAGAACCCAGGTGCTCTGACCTGTCTCGTGAAGGCTTCTACCC CCGATA TCGCCGTGGAAATGGGAGAGCAACGCCAGCCAGAACAA CTACAAGACCACCCCCCTGTGCTGGACAGCGACGGCTCAT TCTTCT GTACAGCAGACTGACCGTGGACAAGAGCCGGTGGCAGGAAGGCAAC GTGTTCA GCTGAGCAGTGATGCACGAGGCCCTGCA AACCA CACTAC CCAGAAGTCCCTGTCTGAGCCTGGCAAG
180	DNA	CAGTCTGTTCTGACACAGCCTCC TACGGCCTCTGGCACACCTGGACA GAGAGT GACCATCAGTGAGCGGCAGCTCCAA CATCGGCAGC AACACCGTGAAC TGGTATCAGCAGCTGGCCTGGCACAGCCCTAAAC GCTGATCTACTACGACGACCTGGCCCTAGCGCGCTGGCAGATAGAT TTCTCGCAGCAAGAGCCGACCTCTGGCAGCGCTTGCTATTCTGGA CTG CAGAGGAGGAGGAGGAGGAGACTATTATGGCCGCCCTGGGAGCA CAGCCTGAAACGACATCGTTTTCCGGGAGGACCAAGCTGACCG TTCTAGGCCAGCTTAAAGCCGCCCTAGCGTGACCTGTTCCCTCCAA GCAGCGACTGAGGCAACAAGGCCACCCCTGCTGTGCGCTGATC AGCGACTTCTATCCTGGCGCCGTGACCGTGGCCTGGAAAGGCCGATAG CTCTCTGTGAAGGGCGCGTGGAAAC CACCA CCTAGAAGCAGA GCAACAAACAAATACGCCGCCAGCAGCTACAGCTGCCAAGTGACCC CAGTGGAAAGTCCCACAGATCTACAGCTGCCAAGTGACCC CAGCAGCGTGGAAAAGACAGTGGCCCTACCGAGTGAC CAGCAGCGTGGAAAAGACAGTGGCCCTACCGAGTGAC
181	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYAMS WVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTI SRD NSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGT LTVTVSSA STKGPSVFPLAPCSRSTSESTAAL
182	PRT	SYAMS
183	PRT	AIGYGGDTYYADSVKG
184	PRT	RDDYTSRDAFDY

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
185	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNVYP VFGGGTKLTVL
186	PRT	SGSSSNIGSNTVN
187	PRT	YDDLRLPS
188	PRT	AAWDDSLNVYPV
189	DNA	GAAGTTCACTGCTGGAAATCTGGCGGCCGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTCACCTTTAGCAGCT ACGCCATGAGCTGGTCCGACAGGCTCTGGCAAAGGCCTTGAATGG GTGTCGCCATCGGCTATGGCGCGATACCTACTACGCCGACTCTGT GAAGGGCAAGATTCAACCATCAGCGGGACAACAGCAAGAACACCCCTG TACACTGCAAGATGAACAGCCTGAGAGCCGAGGGACACGCCGCTGTACTA TTGCGCCAGAAGGGACGACTACACCAGCAGGGACGCCCTTCGATTATT GGGGCCAGGGCACACTGGTACCGTACCGTCTTC
190	DNA	AGCTACGCCATGAGC
191	DNA	GCCATCGGCTATGGCGGCCGATAACCTACTACGCCGACTCTGTGAAGGG C
192	DNA	AGGGACGACTACACCAGCAGGGACGCCCTTCGATTAT
193	DNA	CAGTCTTCTGACACAGCCTCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCCAACATCGGCAGC AACACCGTGAACTGGTATCAGCAGCTGCCAGCAGGCCCTAAACAT GCTGATCTACTACGACGACCTGCGGCCAGCAGATAGAT TTTCTGAGCAAGAGCCGACCTCTGCCAGCCTGCTATTCTGG CTGAGAGCAGGACGAGGGCGACTATTATTGTGCCGCTGGGACGA CAGCTGAACTGTACCCCTGTTTGGCGGAGGACCAAGCTGACCG TTCTA
194	DNA	AGCGGCACGACTCCACATCGGCAGCAACACCGTGAAC
195	DNA	TACGACGACCTGCGGCCCTAGC
196	DNA	GCCGCCTGGGACGACAGCCTGAACGTGTACCCGT
197	PRT	EVQLLESGGGLVQPQGGSLRLSCAASGFTFSSYAMSWRQAPGKGLEWV SAIGYGDYTYADSVKGRFTISRDNISKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGTLVTVSSASTKGPSVFPALCSRSTSESTAA GCLVKDVFPEPVTVWSNSGALTSGVHTFPAVLQSSGLYSLSVVTVPSS LGTKTYTTCNVDHKPSNTKVDKRVESKYGPPCPCCPAPEFLGGPSVLFPP KPKDTLMISRTPEVTCVVVDVSQEDPEVQFNWYVGVEVHNAKTKPRE EQFNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKGQ PREPVYTLPPSQEEMTKNQVSLTCLVKGFYPSDIAVEWESNGOPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHNHYTQK SLSLSLGK
198	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNVYP VFGGGTKLTVLQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPPGAVT VAWKADSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
199	DNA	GAAGTTCACTGCTGGAAATCTGGCGGCCGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTCACCTTTAGCAGCT ACGCCATGAGCTGGTCCGACAGGCTCTGGCAAAGGCCTTGAATGG GTGTCGCCATCGGCTATGGCGCGATACCTACTACGCCGACTCTGT GAAGGGCAAGATTCAACCATCAGCGGGACAACAGCAAGAACACCCCTG TACACTGCAAGATGAACAGCCTGAGAGCCGAGGGACACGCCGCTGTACTA TTGCGCCAGAAGGGACGACTACACCAGCAGGGACGCCCTTCAGCCAGCAGCAAGGGC GGGGCCAGGGCACACTGGTACCGTCTTCAGCAGAAGCACAGCAGTC CCCAGCGCTGTTCCCTGGCCCTTGCTGAGCAGAAGCACAGCAGTC TACAGCCGCCCCGGCTGGCTCGTGAAGGACTACTTCCCGAGGCCG TGACCGTGTCTGGAACTCTGGCGCTCTGACAAGCGGCCGTGACACC TTTCCAGCGCTGCGAGAGCAGCGGCCGTACTCTGAGCAGCGT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
200	DNA	CGTGACAGTGCCTGGCAGCACGCTGGCACCAAGACCTACACCTGTA ACGTGGACCACAAGCCCAGCACACCAAGGTGGACAAGCGGGTGGAA ATCTAATGACGGCCCTCCCTGCCCTCTGCCCGGCCCTGAATTTCCT GGCGGACCCCTCGTGTCTGTCCCCCAAAGCCCAAGGGACACCC TGATGATCAGCGGGACCCCCGAAGTGACCTGCGTGTTGGATGTG TCCCAGGAAGATCCCAGGGTGCAGTTCAATTGGTAGTGGACGGCT GGAAGTGACAACAGCAGCCAAGGCCAGAGAGGAACAGTTAAC AGCACCTACCGGGGGTGTGCTGCTGACAGTGCTGACCCAGGACTG GCTGAACGGAAAGAGTACAAGTGCAAGGTGTCAACAAAGGGCTG CCCAGCTCATCGAGAAAACCATCAGCAAGGCCAAGGGCCAGCCCC GCGAACCCCAGGTGACACACTGCTCCAAGGCCAGGAAGAGATGAC CAAGAACCCAGGTGACCTGTGCTCGTGAAGGCTTCTACCCCT CCGATAATCGCCGTGAAATGGGAGAGCAACGCCAGCCAGAAACAA CTACAAGACCACCCCCCTGTGCTGGACAGCGCACGGCTCATTCCT GTACAGCAGACTGACCGTGGACAAGAGCCGTGGCAGGAAGGAAAC GTGTTAGCTGCAGGGTGTGACAGGCCCCCTGCAACACCACAC CCAGAAGTCCCTGTCTGAGCCTGGGCAAG
201	PRT	EVOLLESGGGLVQPQPGSRLSLCAASGFTFSSYAMSWVRQAPGKGLEWV SAIGYGGDTYYADSVKRFITISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFPYWQGQTLTVSS
202	PRT	SYAMS
203	PRT	AIGYGGDTYYADSVKG
204	PRT	RDDYTSRDAFDY
205	PRT	QSVLTOPPSASGTPGQRVTISCSGSSSNIGSNTVNWYQQLPGTAPKLIIY DDLRSVPDRFSGSKSGTSASLAISGLQSEDEADYYCHAWDDSLNDIV VFGGGTKLTVL
206	PRT	SGSSSNIGSNTVN
207	PRT	YDDLRPS
208	PRT	HAWDDSLNDIVV
209	DNA	GAAGTTCTGCTGGAATCTGGCGGCCGACTGGTTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCACCTTAGCAGCT ACGCCATGAGCTGGGTCGGACAGGCTCTGCCAAAGGCCCTTGAATGG GTTCGGCCATCGGCTATGGCGCGATACCTACTACGCCGACTCTGT GAAGGGCAGATTCAACCATCAGCGGGACAAACAGCAAGAAACACCC TACCTGAGATGAACAGCCTGAGAGGCCAGGACACCGCCGTGTACTA TTGCGCCAGAAGGGACGACTACACCAGCAGGGACGCCCTTCGATTATT GGGGCCAGGGCACACTGGTACCGCTTCTCA
210	DNA	AGCTACGCCATGAGC
211	DNA	GCCATCGGCTATGGCGGCCGATACCTACTACGCCGACTCTGTGAAGGG C
212	DNA	AGGGACGACTACACCAGCAGGGACGCCCTTCGATTAT
213	DNA	CAGTCTGTTCTGACACAGCCTCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCTCAACATCGGCAGC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		AACACCGTGAACTGGTATCAGCAGCTGCCCTGGCACAGCCCCCTAACCT GCTGATCTACTACGACGACCTGCGGCCCTAGCGGCCTGCCAGATAGAT TTCTCGCAGCAAGAGCGGCACCTCTGCCAGCCCTGGCTATTCTCGA CTGCAGAGCGAGGAGCGAGGCCGACTACTATTGTACGCCCTGGGAGCA CAGCCTGAACGACATCGGTTTTGCGGAGGCACCAAGCTGACCG TTCTA
214	DNA	AGCGGCAGCAGCTCCAACATCGGCAGCAACACCGTGAAC
215	DNA	TACGACGACCTGCGGCCCTAGC
216	DNA	CACGCCTGGGACGACAGCCTGAACGACATCGTGGTT
217	PRT	EVQLLESGGLVQPGGSLRLSCAASGFTFSSYAMSWRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTISRDNKNTLYLQMNSLRADTAVYYCA RRDDYTSRDAFDYWGQQLTVVSSASTKGPSVFPLAPCSRSTSESTAA GCLVKDVFPEPVTVWSNSGALTSGVHTFPAVLQSSGLYSLSVVTPVSS LGTKTYYTCNVDHKPNSNTKVDKRVESKYGPCCPPCPAPEFLGGPSVLFPP KPKDTLMISRTPEVTCVVVDVSQEDPEVQFNWYVDGVEVHNAAKTKPRE EQFNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKGQ PREPVYTLPPSQEEMTKNQVSLLTCLVKGPYPSDIAVEWESNGQPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHNHYTQK SLSLSLGK
218	PRT	QSVLTLQPPSASGTPGQRVTI SCGSSSNISGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVDRFSGSKSGTSASLAISLQSEDEADYYCHAWDDSLNDIV VFGGGTKLTVLGQPKAAPSVTFPPSSEELQANKATLVCLISDFYPGAVT VAWKADSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
219	DNA	GAAGTTCAAGCTGCTGGAATCTGGCGGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCGCCAGCGCCCTCACCTTCTAGCAGCT ACGCCATGAGCTGGGTCGCAGGGCTCTGGCAAAGGCCCTGAATGG GTGTCGCCCATCGGCTATGGGGCAGATACCTACTACGCCGACTCTG GAAGGGCAGATTCCACCATGCCGGGACAACAGCAAGAACACCCCTG TACCTGCAGATGAACAGCCTGAGAGCCGAGGGACACCCGGCTGTACTA TTGGCCAGAAGGGCAGACTACACAGCAGGGACGCCCTTCGATTATT GGGGCAGGGCACACTGGTACCGTTCTCAGCCAGCACCAAGGGC CCCAGCGTGTCCCTCTGCCCCCTGTAGCAGAAGCACCAGCGAGTC TACAGCGCCCTGGGACTCTGGCGCTCTGACAAGCGCGTGCACACC TGACCGTGTCTGGAAACTCTGGCGCTCTGACAAGCGCGTGTACTCTGAGCAGCGT TTCCAGCGTGTCTGAGAGCAGCGCCCTGTACTCTGAGCAGCGT CGTGACAGTGCCAGCAGCCTGGGACCAAGACCTACACCTGTA ACGTGGACCAAGGCCAGAACACCAAGGTGGACAAGCGGGTGG ATCTAAAGTACGGCCCTCCCTGCCCTTGCCCCAGCCCTGAATTCT GGCGGACCCCTCGTGTCTGTGTTCCCCAAAGCCAAGGACACCC TGATGATCAGCGGACCCCGAAGTGAACCTGCGTGTGGGGATGTG TCCCAGGAAGATCCCGAGGTGCAGTTCAATTGGTACGTGGACGGGT GGAAGTGCACAACAGCCAGAACAGCCAGAGAGAACAGTTCAAC AGCACCTACCGGGTGTGGCTGTCAGTGCACAGTGCACAGGACTG GCTGAACGGCAAAGTACAAGTGCACAGGTGCAACAAAGGCCCTG CCCAAGCTTCCATCGAGAAAACCATCAGCAAGGCCAGGGCAGGCC GGCACCCCCAGGTGACACACTGCCCTCAAGCCAGGAAGAGATGAC CAAGAACCGGTGCTCTGACCTGTCGTGAAAGGCTTCTACCCCT CCGATATGCCGTGGAATGGGAGAGCAACGGCAGCCGAGAACAA CTACAAGACCAACCCCCCTGTGCTGGACAGGGACGGCTATTCTCC GTACAGCAGACTGACCGTGGACAAGAGCCGGTGGCGAGGAAGGCAAC GTGTTCAAGCTGAGCGTGTGATGCACAGGGCCCTGACAAACCACTACAC CCAGAACGTCCTGTCTGAGCCTGGGCAAG
220	DNA	CAGTCTTCTGACACAGCCTCTAGGCCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTAACATCGGCAGC AACACCGTGAACTGGTATCAGCAGCTGCCCTGGCACAGCCCCCTAACCT GCTGATCTACTACGACGACCTGCGGCCCTAGCGGCCTGCCAGATAGAT TTCTCGCAGCAAGAGCGGCCACCTCTGCCAGCCCTGGCTATTCTCGA CTGCAGAGCGAGGAGCGAGGCCGACTACTATTGTACGCCCTGGGAGCA CAGCCTGAACGACATCGGTTTTGCGGAGGCACCAAGCTGACCG TTCTAGGCCAGCTTAAAGGCCCTAGCGTGCACCTGTGCTGCTGATC GCAGCGAGGAACATGCAGGCCAACAGGCCACCCCTGCGTGTGCTGATC AGCGACTCTATCCTGGCGCCGTGACCGTGGCCTGGAAAGGCCGATAG CTCTCCTGTGAAGGCCGGTGGAAACACCACCCCTAGCAAGCAGA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GCAACAAACAAATAACGCCGCCAGCAGCTACCTGAGCCTGACCCCCGAG CAGTGGAAAGTCCCACAGATCCTACAGCTGCCAAGTGACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTCAGC
221	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWQGQTLTVSS
222	PRT	SYAMS
223	PRT	AIGYGGDTYYADSVKG
224	PRT	RDDYTSRDAFDY
225	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSGVDRFSGSKSGTSASLAISGLQSEDEADYYCHAWDDSLNDYP VFGGGTKLTVL
226	PRT	SGSSSNIGSNTVN
227	PRT	YDDLRLPS
228	PRT	HAWDDSLNDYPV
229	DNA	GAAGTTCACTGCTGGAATCTGGCGCGGACTGGTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCACCTTAGCAGCT ACGCCATGAGCTGGGTCGAGCTCCCTGGCAAAGGCCCTGAATGG GTGTCGCCCATCGCTATGGGGCGATACCTACTACGCCGACTCTGT GAAGGGCAGATTCAACATCAGCCGGACAACAGCAAGAACACCCCTG TACCTGCAGATGAACAGCCTGAGAGCCGAGGACACCCGCTGTACTA TTGCGCCAGAAGGGACGACTACACCAGCAGGGACGGCCTTCGATTATT GGGGCCAGGGCACACTGGTACCGCTTCTTA
230	DNA	AGCTACGCCATGAGC
231	DNA	GCCATCGGCTATGGCGCGATAACCTACTACGCCGACTCTGTGAAGGG C
232	DNA	AGGGACGACTACACCAGCAGGGACGCCTTCGATTAT
233	DNA	CAGTCTGTTCTGACACAGCCTCCTAGGCCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGAGCAGCTAACATCGGCAGC AACACCGTGAACCTGGTATCAGCAGCTGCCACAGCCCCTAAACT GCTGATCTACTACGACGACCTGCGGCTAGCGGCGTGGCAGATAGAT TTCTGGCAGCAAGAGGGCACCTCTGCCAGCCTGGCTATTTCTGGA CTGCAGAGCAGGGACGAGGCGACTACTATTGTACGCCCTGGGACGA CAGCCTGAACGACTACCCCTGTTTGGCGGAGGACCAAGCTGACCG TTCTA
234	DNA	AGCGGCAGCAGCTCCAACATCGGCAGCAACACCGTGAAC
235	DNA	TACGACGACCTGCGGCCTAGC
236	DNA	CACGCCTGGGACGACAGCCTGAACGACTACCCCTGTT
237	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWQGQTLTVSSASTKGPSVFLAPCSRSTSESTAAL GCLVKDVFPEPVTVWSNLSALTSVHVTGFPVLSQSSGLYLSLSSVTPSS LGTKTIVTCNVDPHKPSNTKVDKRVESKYGPPCPAPPEFLGGPSVFLFPP KPKDTLMISRTPEVTCVVVDVSQEDPEVQFNWYVGVEVHNAKTKPRE EQFNNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIETKISKAKGQ PREPVQVYLPSPQEEMTKNQVSLTCLVKGFYPSDIAVEWESENQNPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHNHYTQK SLSLSLGK
238	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSGVDRFSGSKSGTSASLAISGLQSEDEADYYCHAWDDSLNDYP VFGGGTKLTVLQPKAAPSVTLFPPSSEELQANKATLVLISDFYPGAVT VAWKADSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No.	SEQ Type	SEQUENCE
239	DNA	GAAGTTCACTGCTGGAATCTGGCGGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGGCCCTCACCTTTAGCAGCT ACGCATGAGCTGGGTCGACAGGCTCTGGCAAAGGCCCTGAATGG GTGTCGCCATCGGCTATGGCGCATACCTACTACGCCGACTCTGT GAAGGGCAGATTACCCATCAGCCGGACAACAGCAAGAACACCCCTG TACCTGAGATGAACAGCCTGAGAGCCGAGGACACCGCCGTGACTA TTGCGCCAGAAGGGACGACTACACCAGCAGGGACGCCCTGATTATT GGGGCAGGGCACACTGGTACCGTTCTCAGGGCAGCAGGCCAGGGC CCCAGCGTGTCCCTCTGGCCCCCTGTAGCAGAAGCACCAGCAGTC TACAGCGCCCTGGGCTCGTGAAGGACTACTTCCCGAGCCCG TGACCGTGTCTGGAAACTCTGGCGCTGACAAGCGGCCGTGACACC TTTCCAGCCGTGCTGAGAGCAGCGCCCTGACTCTCTGAGCAGGGT CGTGACAGTGCCTCAGCAGCAGCTGGGCCACAAGACCTACACCTGTA ACGTGGACCAAAAGCCAGAACACCAAGGTGGACAAGCGGGTGG ATCTAAGTACGGCCCTCCCTGGCCAGCCCCCTGAAATTCT GGCGGACCCCTCGTGTCTGTTCCCCCAAAGCCAAGGACACCC TGATGATCAGCGGGACCCCGAAGTGCACCTCGCGTGGTGGATGTG TCCCAGGAAAGATCCCGAGGTGCAAGTCAATTGGTACGTGGACGGGT GGAAGTGCACAAACGCCAGAACAGCCAGAGAGAACAGTTCAAC AGCACCTACCGGGTGTCTGTCAGTGCACAGTGCACCCAGGACTG GCTGAACGGAAAGACTACAAGTGCAGGTGTCAACAAAGGCCCTG CCCAGCTCCATCGAGAAACCATCGCAAGGCCAAGGGCAGCC GCGAACCCCAAGGTGACACACTGCGCTCAAGGCCAGGAAGAGATGAC CAAGAACAGGTGTCCTGACCTGTCCTGTAAGGCTTCTACCCCT CCGATAATCGCCGTGGATGGAGAGCAACGCCAGCCGAGAACAA CTACAAGACCACCCCCCTGTGCTGGACAGCGACGGCTCATCTTCC GTACAGCAGACTGACCGTGGACAAGAGCCGTGGCAGGAAGGAAC GTGTTCACTGCGCATGTCAGGCCCCCTGACAAACCACACTACAC CCAGAAGTCCCTGTCCTGAGCCTGGCAAG
240	DNA	CAGTCTGTTCTGACACAGCCTCCTAGCGCTCTGGCACACCTGGACA GAGAGTGAACATCAGCTGTAGCGGCAGCTCCAAACATCGGCAGC AACACCGTGAACCTGTTCTGCTGCGCTAGCGCGTGGCAGATAGAT GCTGATCTACTACGACGACCTGCGGCCCTAGCGCGTGGCAGATAGAT TTCTCGCAGCAAGAGCCGACCTCTGCCAGCGCTGGCTATTCTCGA CTGAGCGAGGAGGACAGGCCACTACTATTGTCAACCCCTGGAGCA CAGCCTGAACGACTACCCCTTTTGCGGAGGCACCAAGCTGACCG TTCTAGGCCAGCTAAAGCCGCCCTAGCGTGACCTGTTCCCTCAA GCAGCGAGGAACTGAGGCCAAACAAAGGCCACCCCTGTTGCGCTGATC AGCGACTCTATCCTGGCGCCGTGACCGTGGCTGGAGGCCGATAG CTCTCTGTGAAGGCCGGCTGGAAACCAACCCCTAGCAAGCAGA GCAACACAAATACGCCGCCAGCAGTACCTGAGCCTGACCCCGAG CAGTGGAAAGTCCCACAGATCTACAGCTGCCAAGTGCACCCAGCAGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGCAG
241	PRT	EVQLESGGGLVQPQPGSRLSCAASGTFSSYAMSWVRQAPKGLEWV SAIGYGGDTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWQGQGLTVTVSS
242	PRT	SYAMS
243	PRT	AIGYGGDTYYADSVKG
244	PRT	RDDYTSRDAFDY
245	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKL DDLRPSPVDRFSGSKSGTSASLAISGLQSEDEADYYCHAWDDSLNVYP VFGGGTKLTVL
246	PRT	SGSSSNIGSNTVN
247	PRT	YDDLRPS
248	PRT	HAWDDSLNVYPV
249	DNA	GAAGTTCACTGCTGGAATCTGGCGGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGGCCCTCACCTTTAGCAGCT ACGCATGAGCTGGGTCGACAGGCTCTGGCAAAGGCCCTGAATGG GTGTCGCCATCGGCTATGGCGCATACCTACTACGCCGACTCTGT GAAGGGCAGATTACCCATCAGCCGGACAACAGCAAGAACACCCCTG

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		TACCTGCAGATGAACAGCCTGAGAGCCGAGGACACCGCCGTGTACTA TTGCGCCAGAAAGGGACGACTACACCAGCAGGGACGCCCTTCGATTATT GGGGCCAGGGCACACTGGTCACCGTTC
250	DNA	AGCTACGCCATGAGC
251	DNA	GCCATCGGCTATGGCGCGATACTACTACGCCACTCTGTGAAGGG C
252	DNA	AGGGACGACTACACCAGCAGGGACGCCCTCGATTAT
253	DNA	CAGTCTTCTGACACAGCCTCTAGGCCCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCAACATCGGCAGC AACACCGTAACCTGGTATCAGCAGCTGGCACAGCCCCTAAACT GCTGATCTACTACGACGACCTGCGGCCCTAGCGGCGTGGCAGATAGAT TTTCTGCGCAGCAAGAGCGGACCTCTGCCAGCCTGCGTATTCTGGA CTGCAGAGCAGGACGAGGCGACTACTATTGTACGCCCTGGGACGA CAGCCTGAACTGTACCTGTGTTTGGCGAGGACCAAGCTGACCG TTCTA
254	DNA	AGCGGCAGCAGCTCAAACATCGGCAGCAACACCGTGAAC
255	DNA	TACGACGACCTGCGGCCTAGC
256	DNA	CACGCCTGGGACGACAGCCTGAACGTGTACCCGT
257	PRT	EVQLESGGGLVQPGGSLRLSCAASGFTFSSYAMSWRQAPGKGLEWV SAIYGDDTYYADSVKRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGTIVTVSSASTKGPSVFLAPCSRSTSESTAAL GCLVKDVFPEPVTVWSNGALTSGVHTFPALQSSGLYSLSVVTVPSSS LGTKTYTCNVDHKPSNTKVDKRVESKGYPCCPPCPAPEFLGGPSVFLFP KPKDTLMISRTPEVTCVVVDVQSQEDPEVQFNWYVGVEVHNAKTKPRE EQFNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIETKISKAKGQ PREPQVTLPPSQEEMTKNQVSLTCLVKGFYPSDIAVEWESENQNPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHNHYTQK SLSLSLGK
258	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVDRFSGSKSGTASLAIISGLQSEDEADYYCHAWDDSLNVYP VFGGGTKLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPGAVT VAWKADSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
259	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCTTACCTTAGCAGCT ACGCCATGAGCTGGTCCGACAGGCTCTGGCAAAGGCCCTGAATGG GTGTCGCCATCGGCTATGGCGCATACTACTACGCCGACTCTGT GAAGGGCAGATTCAACCATCACCGGGACAACAGAACACCCCTG TACCTGCACTGAACAGCCTGAGAGCCGAGGACACCGCCGTGTACTA TTGCGCCAGAAGGGACGACTACACCGCAGGGACGCCCTTCGATTATT GGGGCCAGGGCACACTGGTCACCGTCTTCAGCCAGCACCAAGGGC CCCAGCGTGTCCCTCTGGCCCTTGTAGCAGAACGACAGCAGTC TACAGCCGCCCTGGCTCGTGAAGGACTACTTCCCGAGCCCG TGACCGTGTCTGGAACTCTGGCGCTCTGACAAGCGCGTGCACACC TTTCCACCGCTGCTGAGCAGCAGCGCCCTGTACTCTCTGAGCAGCGT CGTGACAGTGCCTGAGCAGCAGCCCTGGGCACCAAGACCTACACCTGTA ACGTGGACCAAGGCCAGAACACCAAGGTGGACAAGCGGGTGG ATCTAAGTACGCCCTCCCTGCCCTCTGCCAGCCCTGAATTCT GGGCGGACCCCTCCGTCTCTGTTCCCCCAAAGCCAAGGACACCC TGATGATCAGCGGACCCCGAAGTGACCTGCGTGGTGGATGTG TCCCAGGAAGATCCCGAGGTGCAAGTCAATTGGTACGTGGACGGCGT GGAAGTGCACAAACGCCAGAACAGCAGAGAGGAAACAGTTCAAC AGCACCTACCGGGTGGTGCCTGACAGTGCACAGGACTG GCTGAACGGCAAAGACTACAAGTGCAGGTGCAACAAAGGGCCTG CCCAGCTCCATCGAGAAAACCATCAGCAAGGCCAAGGGCAGCCCC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GCGAACCCCAGGTGTACACACTGCCCTCAAGCCAGGAAGGAGATGAC CAAGAACCCAGGTGTCCTGACCTGTCTCGTCAAAGGCTTCTACCCCT CCGATATCGCCGTGAAATGGGAGAGCAACGGCCAGCCCGAGAACAA CTACAAGACCACCCCCCTGTGCTGGACAGCGACGGCTCATTCTTCCT GTACACGAGACTGACCGTGGACAAGAGCCGGTGCAGGAAGGCAAC GTGTTCAAGCTGCAGCGTGTGATGCACGAGGCCCTGCACAACCAACTACAC CCAGAAGTCCCTGTCTGAGCCTGGCAAG
260	DNA	CAGTCTGTTCTGACACAGCCTCTAGCGCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCAACATCGGCAGC AACACGTGAACTGGTATCAGCAGCTGCCCTGGCACAGCCCTAAACT GCTGATCTACTACGACGACCTGCGCCCTAGCGCGTGGCAGATAGAT TTTCTGGCAGCAAGAGCCGACCTCTGGCACGCTGCTATTCTGGA CTGCAGAGCGAGGAGCAGAGGGCGACTACTATTGTACGCCCTGGGACGA CAGCCTGAACTGTGACCTGTTTTGGCGAGGACCAAGCTGACCG TTCTAGGGCCAGCCTAAAGCGCCCTAGCGTGACCCCTGTTCCCAA GCAGCGAGGAACCTGAGGCCAACAGGCCACCCCTGCTGTGCTGATC AGCGACTTCTATCTGGCGCGTGACCGTGGCTGGAAAGGCCGATAG CTCTCTGTGAAGGCCGGCGTGGAAACACCCACCCCTAGCAAGCAGA GCAACAAACAAATACGCCGCCAGCTACCTTGAGCCTGAGCCCCGAG CAGTGAAGTCCCACAGATCTACAGCTGCCAAGTGACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
261	PRT	EVQVLLESGGLVQPFGSRLSLCAASGFTFSSYAMSWVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTIISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQQTLTVSS
262	PRT	SYAMS
263	PRT	AIGYGGDTYYADSVKG
264	PRT	RDDYTSRDAFDY
265	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVPDRFSGSKSGTSASLAISGLQSEDEADYYCHAWDDSLNVIPV FGGGTKLTVL
266	PRT	SGSSSNIGSNTVN
267	PRT	YDDLRPS
268	PRT	HAWDDDSLNVIPV
269	DNA	GAAGTTCAGCTGCTGGAATCTGGCGGCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCGCCAGCGGCTTACCTTTAGCAGCT ACGCCATGAGCTGGCTCGACAGGCTCTGGCAAAGGCTTGAATGG GTGTCGCCATCGGCTATGGCGCGATACTACTACGCCGACTCTG GAAGGGAGATTCACCCATAGCCGGGACAACAGCAAGAACACCCCTG TACCTGCAAGATGAACAGCCTGAGAGCCGAGGACACCGCCGTGACTA TTGCGCCAGAAGGGAGCACTACACAGCAGGGACGCCCTCGATTATT GGGGCCAGGGCACACTGGTACCGTTCTCA
270	DNA	AGCTACGCCATGAGC
271	DNA	GCCATCGGCTATGGCGCGATACTACTACGCCGACTCTGTGAAGGG C
272	DNA	AGGGACGACTACACCAGCAGGGACGCCCTCGATTAT
273	DNA	CAGTCTGTTCTGACACAGCCTCTAGCGCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCAAACATCGGCAGC AACACGTGAACTGGTATCAGCAGCTGCCCTGGCACAGCCCTAAACT GCTGATCTACTACGACGACCTGCGGCCAGCGCGTGGCAGATAGAT TTTCTGGCAGCAAGAGCCGACCTCTGGCACGCTGCTATTCTGGA CTGCAGAGCGAGGAGCAGGGCGACTACTATTGTACGCCCTGGGACGA CAGCCTGAACTGTGACCTGTTTTGGCGAGGACCAAGCTGACCG TTCTA
274	DNA	AGCGGCAGCAGCTCCAACATCGGCAGCAACACCGTGAAC
275	DNA	TACGACGACCTGCGGCCTAGC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No.	SEQ Type	SEQUENCE
276	DNA	CACGCCTGGGACGACAGCCTGAACGTGATCCCTGTT
277	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWV SAIGYGDTYYADSVKGRFTISRDNISKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWQGQTLTVSSASTKGPSVPLAPCSRSTSESTAAL GCLVKDVFPEPVTVWSNSGALTSGVHTFPAVLQSSGLYSLSVSVTPSSS LGTKTYTCNVNDHKPSNTKVDKRVESKGYPCCPPCPAPEFLGGPSVFLFPP PKPDKTLMSIRTPETVTVVVVDVSQEDPEVQPWNWYDVGVEVHNAAKTKPRE EQFNSTYRVSVSLTVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKQ PREPQVYTLPSSQEEEMTKNQVSLTCLVKGPYPSDIAVEWESNGQPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHNHYTQK SLSLSLGK
278	PRT	QSVLTOPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVDRFSGSKSGTSASLAISGLQSEDEADYYCHAWDDSLNVPV FGGGTKLTVLGQPKAAPSVTLFPPSSEELQANKATLVCILISDFYPGAVTV AWKADSSSPVKAGVETTPSKQSNNKYAASSYSLTPEQWKSHRSYSCQ VTHEGSTVEKTVAPTECS
279	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCGGCCAGCGCTTACACCTTAGCAGCT ACGCCATGAGCTGGGTCGGACAGGCTCTGGCAAAGGCCCTGAATGG GTGTCGCCCATCGGCTATGGCGGCGATACCTACTACGCCGACTCTGT GAAGGGCAGATTCAACATCAGCGGGACAAACAGCAAGAACACCTG TACCTGCAGATGAACAGCCTGAGAGGCCAGGACACCGCGTGTACTA TTGCGCCAGAAGGGACGACTACACCAGCAGGGACGCCCTTCGATTATT GGGGCCAGGGCACACTGGTACCCGTTCTTCAGGCCAGCACCAAGGGC CCCAGCGTGTCCCCCTGGGCCCTTGTAAGCAGAACGCCAGCGAGTC TACAGCCGCTGGGCTGCTCGTAAGGACTACTTCCGAGGCC TGACCGTGTCTGGAACTCTGGCGCTGTGACAAGCGCGTGCACACC TTCCAGCCGTGCTGAGCAGCGCCCTGTACTCTGTGAGCAGCGGT CGTGACAGTGGCCAGCAGCGCTGGGCCACCAAGACCTACACCTGTA ACGTGACCAACAGCCAGAACACCAAGGTTGGACAAGCGGGTGG ATCTAAGTACGGCCCTCCCTGCCCTCTTGCCAGCCCTGAATTTC GGGCAGGCTGTCTGGCCAGGCTGTCTGGTACAGTGGACAGCC TGATGATCAGCCCCGCCCCAGCTGGTACACTGGTGTGGGATGTG TCCCAGGAAAGATCCCGGGTGCAGTTCAATTGGTACGTGGACGGGT GGAAGTGCACAACGCCAAGCCAAGGCCAGAGGAGAACAGTTCAAC AGCACCTACCGGGTGTCTGGTACGTGACAGTGTGCAACCCAGGACTG GCTGAACGGCAAAAGAGTACAAGTGCAGGTGCTAACAGGCCCTG CCCAGCTCCATCGAGAAAACCATCAGCAAGGCCAAGGCCAGCCCC GCGAACCCCAGGTGTACACACTGCCCTCAAGCCAGGAAGAGATGAC CAAGAACCGGGTGTCTGGTACCTGTCTGGTACAGGCTTCTACCCCT CCGATATCGCCGTGGAATGGGAGGACAACGCCAGCCAGGAAACAA CTACAAGACCAACCCCCCTGTGCTGGACAGCGACGGCTATTCTCC GTACAGCAGACTGACCGTGGACAAGGCCGGTGGCAGGAAGGCAAC GTGTTCACTGCAGCGTGTGATGCACCGAGGCCCTGCAACAACCAACTACAC CCAGAAGTCCCTGTCTGAGCCTGGGCAAG
280	DNA	CAGTCCTGTTCTGACACAGCCTCTAGGCCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTGACGGCAGCAGCTCCAACATCGGAC AACACCGTGAACTGGTATCAGCAGCTGCCAGGCCCTAAACT GCTGATCTACTACGACGACCTGCGGCCCTAGCGGCCAGATAGAT TTTCTGGCAGCAAGAGCGGCCACCTCTGGCAGCGCTGGCTATTCTGGA CTGCAGAGCAGGGACGAGGGCGACTACTATGGTACGCCCTGGGAGGA CAGCCTGAACGCTGATCCTGTGTTTGGCGGAGGACCCAAGCTGACCG TTCTAGGCCAGCTAAAGGCCCTCTAGCGTGTGACCTGTGCTCCCTCAA GCAGCGAGGAACAGCAGGCCACAGGCCACCTCTGTGTGCTGATC AGCGACTCTCTACCTCTGGCGCGTGAACCGTGGCCTGGAGGCCGATAG CTCTCTGTGAAGGGCCGGCTGGAAACCCACACCCCTAGCAAGCAGA GCAACACAAATACGCCAGCAGCTACCTGAGCTGACCCCTGGCAG CAGTGGAAAGTCCCACAGATCCTACAGCTGCAAGTGCACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTCAGC
281	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWV SAIGYGDTYYADSVKGRFTISRDNISKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWQGQTLTVSS
282	PRT	SYAML

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
283	PRT	AIGTGGDTYYADSVKG
284	PRT	RDDYTSRDAFDY
285	PRT	QSVLTOPPSASGTPGQRTVTCSCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVPDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNDYV VFGGGTKLTVL
286	PRT	SGSSSNIGSNTVN
287	PRT	YDDLRLPS
288	PRT	AAWDDDSLNDYVV
289	DNA	GAAGTTCTAGCTGCTGGAATCTGGCGCCGACTGGTTAACCTGGCGG ATCTCTGAGACTTGAGCTGTGCCGCCAGCGGCTTCACCTTTACAGCTA CGCCCATGCTGTGGGTCGGACAGGGCCCTGGAAAAGGCCTTGAATGGG TGTCCGCCATCGGCACAGGGCGGCTAACCTACTATGCCGACTCTGTG AAGGGCAGATTTCACCATCAGCGGGACAACAGCAAGAACACCCCTGT ACCTGCGAGATGAACAGCGCTGAGAGCCGAGGACACGCCGCTGTACTAT TGCGCCAGGAAGGGACGACTACACCACAGGGACGCCCTTCGATTATTG GGGCCAGGGCACACTGGTCACCGTTCTTC
290	DNA	AGCTACGCCATGCTG
291	DNA	GCCATCGGCACAGGCAGCGATACCTACTATGCCGACTCTGTGAAGGG C
292	DNA	AGGGACGACTACACCACAGGGACGCCCTCGATTAT
293	DNA	CAGTCTGTTCTGACACAGCCTCTAGGCCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGCAGCAGCTCCACATCGGCAGC AACACCGTGAACATGGTATCAGCAGCTGCCCTGGCACAGCCCCCTAAACT GCTGATCTACTACGACGACTTGCGGCCCTAGCGGCCCTGCCAGCTGGCTATTCTGG TTTCTGGCAGCAAGAGCGGACCTCTGCCAGCCTGGCTATTCTGG CTGCAGAGCGAGGACGGGCGACTATTATTGTGCCGCTGGGACGA CAGCCTGAAACGACTACGTTGTGTTGCCGAGGGACCAAGCTGACCC TTCTA
294	DNA	AGCGGCAGCAGCTCCAACATCGGCAGCAACACCGTGAAC
295	DNA	TACGACGACCTGCGGCCCTAGC
296	DNA	GCCGCCTGGGACGACAGCCTGAACGACTACGTTGTG
297	PRT	EVQLLESGGGLVQPQGSSLRLSCAASGFTFYSYAMLWVRQAPGKGLEW SAIGTGGDTYYADSVKGRTFISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGTIVTWSASTKGPSVFP LAPCSRSTSESTAAL GCLVKDVFPEPVTVSWSNNGALTSGVHTFPAVLQSSGLYSLSVVTPSS LGTKTYTCNVDHKPNSNTKVDKRVEKYKCKVSNKGLPSSIETKTISKAKGQ PKPDTLMISRTPEVTCVVVDVSQEDPEVQFNWYVDGVIEVHNAKTKPRE EQFNSTYRVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIETKTISKAKGQ PREPQVYTLPPSQEEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCVMHEALHNHYTQK SLSLSLGK
298	PRT	QSVLTOPPSASGTPGQRTVTCSCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVPDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNDYV VFGGGTKLTVLQKQVSLTCLVKGFYPSDIAVEWESNGQPENNY VAWKADSPVKAGVETTPSKQSNNKYASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
299	DNA	GAAGTTCTAGCTGCTGGAATCTGGCGCCGACTGGTTAACCTGGCGG ATCTCTGAGACTTGAGCTGTGCCGCCAGCGGCTTCACCTTTACAGCTA CGCCCATGCTGTGGGTCGGACAGGGCCCTGGAAAAGGCCTTGAATGGG TGTCCGCCATCGGCACAGGGCGGCTAACCTACTATGCCGACTCTGTG AAGGGCAGATTTCACCATCAGCGGGACAACAGCAAGAACACCCCTGT ACCTGCGAGATGAACAGCCTGAGAGCCGAGGACACGCCGCTGTACTAT TGCGCCAGGAAGGGACGACTACACCACAGGGACGCCCTTCGATTATTG GGGCCAGGGCACACTGGTCACCGTTCTGCCAGCAGCAACCAAGGGCC CCAGCGTGTCCCTCTGCCCTGTAGCAGAAGCACCAGCGAGTCT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
300	DNA	ACAGCCGCCCTGGGCTGCCCTCGTGAAGGACTACTTTCCCGAGCCCCGT GACCCTGTCTGGAACTCTGGCCTCTGACAAGCGGCCGTGCACACCT TTCCGGCGCTGCTGAGCAGCAGCGGGCTGTACTCTCTGAGCAGCGCTC GTGACAGTGCCCAGCAGCAGCGGGCTGGCACCAAGGACTACACCTGTAA CGTGGACCAAAAGCCAGAACACCAAGGTGGACAAGCGGGTGGAA TCTAAGTACGGCCCTCCCTGCCCTCCTGCCAGCCCCCTGAATTTCG GGCGGACCCCTCCGTGCTTCCCTGCTTCCCCCAAAGGCCAAGGACACCCCT GATGATCAGCCGGACCCCGAAGTGACCTCGCGTGGTGGATGTGT CCCAGGAAGATCCGAGGTGAGTTCAATTGGTACGTGGACGGCGCTG GAAGTGACAACGCCAACGACAAGCCAGAGAGAACAGTTCAACA GCACCTACCGGGTGGTGTCCGTGCTGACAGTGCTGCACCCAGGACTGG CTGAGCGCAAAGAGTACAAGTGACAGTGCTGCCAACAGGGCCTGCG CCAGCTCATCGAGAAAACCATCAGCAAGGCCAACGGCCAGGGCG CGAACCCCAAGGTGTACACACTGCTCTCCAAGGCCAGGAAGAGATGACC AAGAACCCAGGTGTCCCTGACCTGTCTCGTAAAGGCTTCTACCCCTC CGATACTGCCGTGGAATGGGAGAGCAACGCCAGGCCAGAACAC TACAAGACCAACCCCCCTGTGCTGGACAGCGACGGCTCATCTTCT GTACAGCAGACTGACCGTGGACAAGAGCCGGTGGCAGGAAGGCAAC GTGTTCAAGCTGCCAGGTGATGACGAGGCCCTGCAACACACTACAC CCAGAAGTCCCTGTCTCGACCTGGCAAG
301	PRT	CAGTCTGTTCTGACACAGCCTCTAGGCCCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCCAACATCGGCAGC AACACCTGTAAGTACTGGTACAGCAGCTGCCAGCAGCCCCCTAAACT GCTGATCTACTACAGCAGACTGCCAGCTAGCGGCTGCGCAGATAGAT TTTCTGGCAGCAAGAGCGCACCTCTGCCAGCCTGGCTATTCTGGA CTGCAGAGCAGGAGCAGGGCGACTATTATTGTGCCGCTGGGACGA CAGCCTGAAACGACTACCTGTGTTGGCGGAGGACCCAAGCTGACCG TTCTAGGCCAGCTAAAGCCGCCCTAGCGTGACCCCTGTTCCCTCAA CGAGCAGGAACTGAGGCCAACAGGCCACCCCTGCTGTGCTGATC AGCAGACTCTATCCTGGCGCGTGACCGTGGCTGGAGGCCGATAG CTCTCTGTGAAGGCCGGCTGGAACACCCACCCCTAGCAAGCAGA GCAACAAACAAATACGCCGCCAGCAGCTACCTGAGCCTGACCCCGAG CAGTGAAGTCCCACAGATCTACAGCTGCCAGTGAACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
302	PRT	SYAML
303	PRT	AIGTGGDTYYADSVKG
304	PRT	RDDYTSRDAFDY
305	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVDRFSGSKSGTASLAIISGLQSEDEADYYCAAWDDSLNVVV VFGGGTKLTVL
306	PRT	SGSSSNIGSNTVN
307	PRT	YDDLRPS
308	PRT	AAWDDSLNVVV
309	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGACTGGTTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCTTACCTTTACAGCTA CGCCATGCTGGGTCCGACAGGCCCTGGAAAAGGCCCTGAATGGG TGTCCGCCATCGCAGGGCGGATACCTACTATGCCAGCTCTGTG AAGGGCAGATTCAACCATCAGCCGGGACAACAGCAAGAACACCCCTGT ACCTGAGATGAACAGCCTGAGAGCGAGGACACCCCGTGTACTAT TGCAGGAGAAGGGACGACTACACCAAGCAGGGACGCCCTCGATTATTG GGGCCAGGGCACACTGGTCACCCTTCT
310	DNA	AGCTACGCCATGCTG
311	DNA	GCCATCGGCACAGGCGCGATACCTACTATGCCAGCTCTGTGAAGGG C
312	DNA	AGGGACGACTACACCAGCAGGGACGCCCTTCGATTAT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No.	SEQ Type	SEQUENCE
313	DNA	CAGTCTGTTCTGACACAGCCTCCCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGGCAGCAGCTCCAACATCGGCAGC AACACCGTGAACTGGTATCAGCAGCTGCCAGCAGCCCCCTAAACT GCTGATCTACTACGACGACCTGCGGCCCTAGCGGCAGATAGAT TTTCTGGCAGCAAGAGCGGCACCTCTGCCAGCCTGGCTATTCTGGA CTGCAGAGCGAGGACGAGGCGACTATTATGTGCCGCTGGGACGA CAGCCTGAACGTGTACGTTGTGTTGGCGGAGGACCAAGCTGACCG TTCTA
314	DNA	AGCGGCAGCAGCTCAAACATCGGCAGCAACACCGTGAAC
315	DNA	TACGACGACCTGCGGCCTAGC
316	DNA	GCCGCCTGGGACGACAGCCTGAACGTGTACGTTGTG
317	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFYSYAMLWVRQAPGKGLEWV SAIGTGGDTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYCYA RRDDYTSRDAFDYWGQTTLVTVSSASTKGPSVFPLAPCSRSTSESTAAL GCLVKDVFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSVVTVPPSS LGTKTYTCNVTDHKPSNTKVDKRVEKYGPCCPPCPAPEFLGGPSVFLFPP KPKDTLMISRTPEVTCVVVDVSQEDPEVQPNWYDVGVEVHNAKTKPRE EQFNSTYRVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKQ PREPQVYTLPPSQEEMTKNQVSLTCLVKGPYPSDIAVEWESNGQFENNY KTPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCVMHEALHNHYTQK SLSLSLGK
318	PRT	QSVLTQPPSASGTPGQRVTIISCGSSSNIGSNTVNWYQQLPGTAPKLIIY DDLRPSGPDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNVYV VFGGGTKLTVLQPKAAPSIVLFPSSSEELQANKATLVCILSDFYPGAVT VAWKADSPVKAQGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
319	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTACCTTTACAGCTA CGGCCATCGGCACAGCGGCCGATACTACTATGCCACTCTGTG TGTCCGCATCGGCACAGCGGCCGATACTACTATGCCACTCTGTG AAGGGCAGATTCAACCATCAGCGGCCAACAGCAAGAACACCCCTGT ACCTGCGAGTAACAGCTGAGAGCGGAGGACACCGCCGTGTACTAT TGCAGCGAGAAGGGACGACTACACCAAGCAGGGACGCGCTTCGATTATTG GGCCAGGGCACACTGGTCACCGTCTTCAGCCAGCACCAAGGGCC CCAGCGTGTCCCTCTGGCCCTTGTAGCAAGCAGCACCGAGTCT ACAGCCGCCCTGGGCTCGTGAAGGACTACTTCCGAGCCGT GACCGTGTCCCTGGAACTCTGCGCCTGTGACAAGCGCGCTGCACACCT TTCAGCCCGTGTGAGAGCAGCGGCCCTGTACTCTGTGAGCAGCGTC GTGACAGTGCAGCAGCGCCAGCTGGCACAAGACCTACACCTGTAA CGTGGACCACAAGGCCAGCAACACCAAGGTGGACAAGCGGGTGGAA TCTAAGTACGGCCCTCCCTGCCCTCTGGCCAGCCCTGAATTCTG GGCGGACCCCTCGGTCTCTGGTCCCTGGTCCCACAGGCCAAGGACACCC GATGATCAGCGGGACCCCGAAGTGACTCTGGTGGTGGATGTGT CCCAGGAAGATCCCGAGGTGTCAGGTCATTGGTAGTGTGAGCGCGTG GAAGTGCACACAGCCAAGACAAGGCCAGAGAGAACAGTCAACA GCACCTACCGGGTGGTCTCGTGAAGTGTGCAACAGGGCCCTG CTGAACGGCAAGAGTACAAGTGCAGGTTGTCACAGTGTGCAACAGGGCC CCAGCTCCATCGAGAAAACCATCAGCAAGGCCAACGGCCAGCCCC CGAACCCCCAGGTGTACCAACTGCCCTCAAGGCCAGGGAGAGATGACC AAGAACCCAGGTGTCCCTGACCTGTCTGTGAAAGGCTCTACCCCTC CGATATGCCGTGGATGGAGAGAACCGGCAGCCAGAAC TACAAGACCACCCCCCTGTGCTGGACAGCGACGGCTCATTCTCC GTACAGCAGACTGACCGTGGACAAGAGCCGTGGCAGGAAGGCAAC GTGTTCACTGCACTGAGTGTGACGAGGCCCTGCACAACCAACTACAC CCAGAAGTCCCTGTCTGAGCCTGGCAAG
320	DNA	CAGTCTGTTCTGACACAGCCTCCCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGGCAGCAGCTCCAACATCGGCAGC AACACCGTGAACTGGTATCAGCAGCTGCCAGCAGCCCCCTAAACT GCTGATCTACTACGACGACCTGCGGCCCTAGCGGCAGATAGAT TTTCTGGCAGCAAGAGCGGCACCTCTGCCAGCCTGGCTATTCTGGA CTGCAGAGCGAGGACGAGGCGACTATTATGTGCCGCTGGGACGA CAGCCTGAACGTGTACGTTGTGTTGGCGGAGGACCAAGCTGACCG TTCTAGGCCAGCCCTAAAGGCCCTAGCGTGAACCTGTTCCCTCAA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GCAGCGAGGAACCTGCAGGCCAACAGGCCACCCCTCGTGTGCGCTGATC AGCGACTCTATCCTGGCGCCGTGACCGTGGCCTGGAAAGGCCGATAG CTCTACCTGTGAAGGCCGGCGTGGAAACCCACCCACCTAGCAAGCAGA GCAACACAATAACGCCAGCAGCTACCTGTGAGCTGACCCCCGAG CAGTGAAGTCCCACAGATCTTACAGCTGCCAAGTGACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTCAGC
321	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFYYSYAMSWVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTISRDNISKNTLYLQMNSLAEDTAVYYCA RRDDYTSRDAFDYWQQGLTVTVSS
322	PRT	SYAMS
323	PRT	AIGYGGDTYYADSVKG
324	PRT	RDDYTSRDAFDY
325	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVDRFSGSKSGTSASLAISGLQSEDEADYYCHAWDDSLNVYP VFGGGTKLTVL
326	PRT	SGSSSNIGSNTVN
327	PRT	YDDLRPS
328	PRT	HAWDDDSLNVYPV
329	DNA	GAAGTTACAGCTGCTGGAATCTGGCGCCGGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCGCCAGCGGCTTCACCTTTACAGCTA CGCCATGAGCTGGCTCGACAGGCCCTGGAAAAGGCCCTGAATGG TGTCCGCATCGGCTATGGCGGCATACCTACTACGCCGACTCTGTG AAGGGCAGATTACACCATCAGCGGGGACAACAGCAAGAACACCCCTGT ACCTGCGAGATGAACAGCCTGAGAGCGAGGACACCGCCGTGACTAT TGCAGGAGGGACGACTACACCAAGCAGGGACGCCTTCGATTATTG GGGCCAGGGCACACTGGTCACCCTTC
330	DNA	AGCTACGCCATGAGC
331	DNA	GCCATCGGCTATGGCGCGATACCTACTACGCCGACTCTGTGAAGGG C
332	DNA	AGGGACGACTACACCAGCAGGGACGCCCTTCGATTAT
333	DNA	CAGTCTTTCTGACACAGCCTCTAGCGCCTCTGGCACACCTGGACA GAGAGTGAACCATCAGCTGTAGCGGCAGCAGCTCAACATCGGCAGC AACACCGTGAACCTGGTATCAGCAGCTGGCTGGCACAGCCCTAAACAT GCTGATCTACTACGACGACCTGCGGCCAGCGCTGGCAGATAGAT TTTCTGAGCAAGAGCGGACCTCTGCCAGCCCTGGCTATTCTGGA CTGCAGAGCGAGGACGAGGGCGACTACTATTGTACGCCCTGGGACGA CAGCCTGAACGTGTACCCCTGTTTGGCGGAGGACCAAAGCTGACCG TTCTA
334	DNA	AGCGGGACGAGCTCAAACATCGGCAGCAACACCGTGAAC
335	DNA	TACGACGACCTGCGGCCCTAGC
336	DNA	CACGCCCTGGGACGACAGCCCTGAACGTGTACCCCTGTT
337	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFYYSYAMSWVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTISRDNISKNTLYLQMNSLAEDTAVYYCA RRDDYTSRDAFDYWQQGLTVVSSASTKGPSVFPLAPCSRSTSESTAAL GCLVKDVFPEPVTVWSNSGALTSGVHTFPAPLQSSGLYSLSSVVTPVSS LGTKTYTTCNVDHKPSNTKVDKRVESKYGPCCPAPFELGGPSVFLFPP KPKDTLMISRTPEVTCVVVDVSQEDPEVQFNWYVDGVEVHNAAKTKPRE EQFNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIETKISKAKGQ PREPQVYTLPPSQEEMTKNQVSLTCLVKFYPSPSDIAVEWESNGQPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHNHYTQK SLSLSLGK
338	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVDRFSGSKSGTSASLAISGLQSEDEADYYCHAWDDSLNVYP

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		VFGGGTKLTVLQPKAAPSVTLPFPSSSEELQANKATLVLCLISDFYPGAVT VAWKADSSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVKEVTAPECTES
339	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCAGCGGCTTACCTTTACAGCTA CGCCATGAGCTGGGTCGGACAGGGCCCTGGAAAAGGCCTGGAATGGG TGTCGGCATCGGCTATGGCGCGATACTTACGGCAGCTCTGTG AAGGGCAGATTCAACCATCAGCGGGACAAACAGCAAGAACACCCCTGT ACCTGCGAGATGAACAGCTGAGAGCCGAGGACACCGCGTGTACTAT TGCAGCGAAGGGACGACTACACCAAGCAGGGACGCCTTCGATTATTG GGGCGAGGACACACTGGTCACCGTCTTCAGCCAGCACCAAGGGCC CCAGCGTGTCCCTTGCCCCCTTGTAGCGAAGCAGCACCGGAGTCT ACAGCCGCCCTGGGCTGCGCTGTGAAGGACTACTTCCGAGGCCGT GACCGTGTCTGGAACTCTGGCCTCTGACAAGCGGGGTGACACACT TTCCAGCGCTGCTGAGAGCAGCGGCTGTACTCTTGAGCAGCGTC GTGACAGTGGCCAGCAGCAGCTGGGACCAAGACCTACACCTGAA CGTGGACACAAGGCCAGCAACACCAAGGTGGACAAGGGGGTGGAA TCTAAGTACGGCCCTCCCTGGCCCTCTGCCCAGCCCCTGAATTCTG GGCGGACCCCTCCGTGTTCCCTGTTCCCCCAAAGGCCAAGGACACCC GATGATCAGCCGAGCCCCGAAGTGACCTGCGTGTGGATGTGT CCCAGGAAGATCCCGAGGTGAGTTCAATTGGTAGTGGACAGCGTG GAAGTGCACAACGCCAAGACCAAGGCCAGAGGAACAGTCAACA GCACCTACCGGGTGGTGTGGCTGACAGTGTGCAAGGACTGG CTGAACGGCAAAGAGTACAAGTGCAAGGTGTCACAAAGGGCCCTGC CCAGCTCATCGAGAAAACCATCAGCAAGGCCAAGGGCCAGCCCC CGAACCCAGGTGACACACTGGCTCCAAGCCAGGAAGAGATGACC AAGAACCGAGGTGCTCCGTGACCTGTGAAAGGCTTCTACCCCTC CGATATGCCGTGGAAAGGGAGAGCAACGGCAGCCCAGAACAC TACAAGACCAACCCCCCTGTGCTGGACAGGACGGCTATTCTCCT GTACAGCAGACTGACCGTGGACAAGAGCCGGTGGCAGGAAGGCAAC GTGTTCAAGCTGCAGCGTGTGATGCAACAGGAGCCCTGCAACAAC CCAGAAGTCCCTGTCCTGAGCCTGGGCAAG
340	DNA	CAGTCTGTTCTGACACAGCCTCTAGGCCCTCTGGCACACCTGGACA GAGAGTGCACCATCAGCTGTGAGCGCAGCTCCAACATCGGCAGC AACACCGTGAACTGGTATCAGCACGCTGCCACAGCCCTAAACT GCTGATCTACTACGACGACCTGCGGCTAGCGGCGTGGCAGATAGAT TTTCTGGCAGCAAGAGCGGACCTCTGGCAGCGCTGGCTATTCTGGA CTGAGAGCGAGGAGCCGGCGACTACTATTGTACGCCCTGGGAGGA CAGCCTGAAACGTGTACCCCTGTTTGGCGGAGGCACCAAGCTGACCG TTCTAGGCCAGCTAAAGGCCCTAGCGTGAACCTGTTCCCTCAA GCAGCGAGGAACGTGAGGCCAACAGGCCACCTCGTGTGCGCTGATC AGCGACTCTATCCTGGCGCGGTGACCGTGGCCTGGAAAGGCCGATAG CTCTCTGTGAAGGCCGGCTGGAAACCCACACCCCTAGCAAGCAGA GCAACACAAATACGCCAGCAGCTACCTGAGCTGACCCCCAG CAGTGGAAAGTCCACAGATCTACAGCTGCCAAGTGACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTCAGC
341	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFYSYAMSWVRQAPGKGLEW SAIGYGGDTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGTLTVSS
342	PRT	SYAMS
343	PRT	AIGYGGDTYYADSVKG
344	PRT	RDDYTSRDAFDY
345	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSGVDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNDIPV FGGGTKLTVL
346	PRT	SGSSSNIGSNTVN
347	PRT	YDDLRPS
348	PRT	AAWDDDSLNDIPV
349	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCAGCGGCTTACCTTTACAGCTA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		CGCCATGAGCTGGGTCCGACAGGCCCTGGAAAAGGCCTTGAATGGG TGTCCGCCATCGGCTATGGCGGCATACTACTACGCCACTCTGTG AAGGGCAGATTCAACCATCAGCGGGACAACAGCAAGAACACCCCTGT ACCTGCGAGATGAACAGCCTGAGAGGCGAGGACACCGCCGTGACTAT TGCGCCAGAAGGGACGACTACACCAAGCAGGGACGCTTCGATTATTG GGGCCAGGGCACACTGGTCACCCTTCTTC
350	DNA	AGCTACGCCATGAGC
351	DNA	GCCATCGGCTATGGCGGGGATACTACTACGCCACTCTGTGAAGGG C
352	DNA	AGGGACGACTACACCAGCAGGGACGCCCTTGATTAT
353	DNA	CAGTCTTCTGACACAGCCTCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCAACATCGGCAGC AACACCTGAACTGGTATCAGCAGCTGGCACAGCCCCCTAAACAT GCTGATCTACTACGACGACCTGCGGCCTAGCGCGTGGCAGATAGAT TTCTCGCAGCAAGAGGGCACCTCTGCCAGCCTGCGCTATTTCTGGA CTGCAGAGCAGGGACGAGGCGACTATTATTGTGCCGCTGGGACGA CAGCCTGAAACGACATCCCTGTTTGCGGGAGGACCCAAGCTGACCG TTCTA
354	DNA	AGCGGCAGCAGCTCAAACATCGGCAGCAACACCGTGAAC
355	DNA	TACGACGACCTGCGGCCCTAGC
356	DNA	GCCGCCTGGGACGACAGCCTGAACGACATCCCTGTT
357	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFYSYAMSWVRQAPGKGLEW SAIYGDDTYYADSVKRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQTLTVSSASTKGPSPVFLAPCSRSTSEESTAAL GCLVKDVFPEPVTVWSNSGALTSGVHTFPALQSSGLYSLSVVTPVSSS LGTKTYTCNVDHKPNTKVDKRVESKYGPCCPPCAPEFLGGPSVLFPP KPKDTLMISRTPEVTVVVDVSQEDPEVQFNWYDVGVEVHNAKTKPRE EQFNSTYRVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKGQ PREPVYITLPPSQEEMTKNQVSLTCLVKFYPDSIAWEWESNCOPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCVMHEALHNHYTQK SLSLSLGK
358	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLPRSPGVDRFSGSKSGTASLASLISGLQSEDEADYYCAAWDDS LNDIPV FGGGTKLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPGAVTV AWKADSSPVKAGVETTTPSKQSNNKYAASSYSLTPEQWKSHRSYSCQ VTHEGSTVEKTVAPTECS
359	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGGACTGGTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTACCTTTTACAGCTA CGCCATGAGCTGGGTCCGACAGGCCCTGGAAAAGGCCTTGAATGGG TGTCCGCCATCGGCTATGGCGGATACTACTACGCCACTCTGTG AAGGGCAGATTCAACCATCAGCGGGACAACAGCAAGAACACCCCTGT ACCTGCGAGATAACACGCTGAGAGCAGGGACACCCCGTGTACTAT TGCGCCAGAAGGGACGACTACACCAAGCAGGGACGCCCTTCGATTATTG GGGCCAGGGCACACTGGCTACCGGTTCTTCAGCCAGCACCAAGGGCC CCAGCGTGTCCCTCTGGCCCTTGTAGCAGAAGCACAGCGAGTCT ACAGCCGCCCTGGGCTGCTGTGAAGGACTACTTCCCGAGCCGT GACCGTGTCTGGAACTCTGGCGCTTGACAAGCGGCGTGCACACCT TTCAGCGTGTGGAGAGCAGCGGCCCTGTACTCTGTGAGCAGCGTC GTGACAGTGGCCAGCAGCAGCTGGGACCAAGACCTACACCTGTAA CGTGGACACAAGGCCAGCAACACCAAGGTGACAAGCGGGTGGAA TCTAAGTACGGCCCTCCCTGCCCCTCTGGCCAGCCCCCTGAATTCTG GGCGGACCCCTCGTGTCCCTGTTCCCCAAAGCCCAAGGACACCT GATGATCAGCGGGACCCCGAAGTGAACCTGCGTGGTGGATGTGT CCCAGGAAGATCCGAGGTGAGTTCAATTGGTACGTGGACGGCGTG GAAGTGACACAAGGCCAAGGACAAGGCCAGAGAGGAACAGTCAACA GCACCTACCGGGTGGTCCCTGCTGACAGTGCCTGCAACAGGACTGG CTGAACGGCAAGAGTACAAGTGCAGGAGTCCAAACAAGGGCCTG CCAGCTCATCGAGAAAACCATCAGCAAGGCAAGGGCAGCCCG CGAACCCAGGTGTACACACTGCCCTCAAGCCAGGAAGAGATGACC AAGAACCCAGGTGTCCCTGACCTGTCGTGAAGGCTTCAACCCCTC CGATATGCCGTGGAATGGGAGAGCAACGCCAGGCCAGAACAC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
360	DNA	TACAAGACCACCCCCCTGTGCTGGACAGCGACGGCTCATTCTCCCTGTACAGCAGACTGACCGTGGACAAGAGCCGGTGGCAGGAAGGCAACGTGTTCAAGCTGCAGCGTGTATGCACGAGGCCCTGCAACAACCACTACACCCAGAAGTCCTGTCTGAGCCTGGGCAAG
361	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFYSYAMSWVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RRDDYTSRDAFDYWGQGTLVTVSS
362	PRT	SYAMS
363	PRT	AIGYGGDTYYADSVKG
364	PRT	RDDYTSRDAFDY
365	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNIGSNTVNWYQQLPGTAPKLIIYD DDLRLPSPVDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNVIPV FGGGTKLTVL
366	PRT	SGSSSNIGSNTVN
367	PRT	YDDLRLPS
368	PRT	AAWDDSLNVIPIV
369	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTCACCTTTACAGCTA CGCCATGAGCTGGGTCGGACAGGCCCTGGAAAAGGCCTTGAATGGG TGTCGGCATCGGCTATGGCGCGATACCTACTACGGCGACTCTGTG AAGGGCAGATTACCATCAGCCGGACACAGCAAGAACACCCCTGT ACCTGAGATGAACACGCTGAGAGCGAGGACACCCCTGTACTAT TGCAGAGAAGGGACGACTACACAGCAGGGACGCCTCGATTATTG GGGCCAGGGCACACTGGTCACCGTTCTGATTCA
370	DNA	AGCTACGCCATGAGC
371	DNA	GCCATCGGCTATGGCGCGATACTACTACGCCGACTCTGTGAAGGGC
372	DNA	AGGGACGACTACACCAGCAGGGACGCCCTTCGATTAT
373	DNA	CAGTCTTCTGACACAGCCTCTAGGCCCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCGCTCAACATCGGCAGC AACACCGTGAACTGGTATCAGCAGCTGCCAGGCCCTAAG GCTGATCTACTACGACGACCTGCGGCCCTAGCGGCGTGCAGATAGAT TTCTGGCAGCAAGAGCGGGCACCTCTGCCAGCCTGGCTATTCTGG CTGCAGAGCGAGGACAGGGCGACTATTATGTGCCGGCTGGGAGGA CAGCCTGAACGTGATCCCTGTTTGGCGGAGGACCAAGCTGACCG TTCTA
374	DNA	AGCGGCAGCAGCTCCAACATCGCAGCAACACCGTGAAC
375	DNA	TACGACGACCTGCGGCCCTAGC
376	DNA	GCCGCCTGGGACGACAGCCTGAACGTGATCCCTGTT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
377	PRT	EVQLESGGLVQPGGSLRLSCAASGFTFDYEMNWVRQAPGKGLEWV SAIGYGGDTYYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYCA RRDDYTRDADFYWGQGTIVTSSASTKGPSVFPLAPCSRSTSEESTAAL GCLVKDYPFPEPVTVWSNSGALTSGVHTFPAPLQSSGLYSLSVVTPVSSS LGTKTYTCNVNDHKPSNTKVDKRVEKYGGPPCPAPPEFLGGPSVFLFPP PKPKDTLMISRTPEVTCVVVDVSQEDPEVQFNWYVDGVVEHNAKTKPRE EQFNSTYRVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKGQ PREPQVYTLPPSQEEMTKNQVSLLTCLVKGFYPSDIAVEWESENQNPENNY KTPPPVLDSDGSFFLYSRLTVDKSRWQEGNVFSCSVMHEALHNHYTQK SLSLSLKG
378	PRT	QSVLTQPPSASGTPGQRVTI CSGSSSNIGSNTVNWYQQLPGTAPKLLIYY DDLRLPSPVPDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLNVI PV FGGGTKLTVLQPKAAPS VTLFPPSSEELQANKATLVCLISDFYPGAVTV AWKADSSPVKAGVETTTPSKQSNNKYAASSYLSLTPEQWKSHRSYSCQ VTHEGSTVEKTVAPTECS
379	DNA	GAAGTTCA GCTG TCGGAATCTGGCGCCGGACTGGTCAACCTGGCGG ATCTCTGAGACTTGAGCTGTGCGCCAGCGGCTTACACCTTTACAGCTA CGCCATGAGCTGGTCCGACAGGCCCTGGAAAAGGCCTTGAAATGGG TGTCCGCATCGCTATGGCGGCATACCTACTACCGCCACTCTGTG AAGGGCAGATT CACCATCAGCGGGACAACAGCAAGAACACCCCTG ACCTGCGAGATGAACACGCTTGAGAGCCGAGGACACCGCCGTACTAT TGC GCGAGAAGGGACGACTACACCAGCAGGGACGCGCTTCGATTATTG GGGCCAGGGCACACTGGTCACCGTTCTTCAGCCAGCACCAAGGGCC CCAGCGTGTCCCTCTGGCCCTTGTAGCAGAAGCACAGCGAGTCT ACAGCGCCCTGGGCTGCGTGAAGGACTACTTCCGAGGCCGT GACCGTGTCCCTGGAAACTCTGGCGCTTGACAAGCGGGCTGCACACCT TTCCAGCGTGTGAGCAGCGCCGTGACTCTCTGAGCAGCGTC GTGACAGTGC CAGCAGCAGCAGCTGGCACAAGACCTACACCTGAA CGTGGACCAAGGCCAGCAACACCAAGGTGGACAAGCGGGTGGAA TCTAAGTACAGGCCCTCCCTGGCTTGCCAGCCCCTGAATTCTG GGCGGACCCCTCGTGTCCCTGTTCCCCAAAGGCCAAGGACACCCCT GATGATCAGCGGGACCCCGAAGT GACTCGCGTGGTGGATGTG CCCAGGAAGATCCGAGGTGAGCTTCAATTGGTAGTGGACGGCGTG GAAGTGCACAAGCCAAGACCAAGGCCAGAGAGAACAGTTCAACA GCACCTACCGGTGGTCCCTGCTGACACTGCTCACCGAGACTGG CTGAACGGCAAAGAGTACAAGTGAAGGTGTCACAAAGGCCCTG CCAGCTCATCGAGAAAACCATCAGCAAGGCCAAGGGCAGCCCG CGAAGCCAGGTGACACACTGGCTCAAGCCAGGAAGAGATGACC AAGAACCCAGGTGCTCTGACCTGTCTGTGAAAGGCTCTACCCCTC CGATATGCCGTGGAATGGGAGAGAACGCCAGCCGAGAACAC TACAAGACCACCCCCCTGTGCTGGACAGCAGCGCTATTCTCCT GTACAGCAGACTGACCGTGGACAAGAGCCGTGGCAGGAAGGCAAC GTGTTCA GCTGAGCTGATGCA CGAGGCCCTGACA ACCACTACAC CCAGAAGTCCCTGTCCTGAGCCTGGCAAG
380	DNA	CAGTCTGTTCTGACACAGCCTCCCTAGCGCTCTGGCACACCTGGACA GAGAGT GACCATCAGCTGAGCTGAGCGCAGCTCCAA CATCGGCAGC AACACCGTGAACGTGATCAGCAGCTGGCCAGCCCTAACACT GCTGATCTACTACGACGACCTGGCCAGCTAGCGCGTGGCAGATAGAT TTCTCGCAGCAAGAGCCGACCTCTGGCAGCGCTTGCTATTCTGGA CTG CAGAGGAGGAGGAGGAGGAGACTATTATGTCGCGCCCTGGGAGCA CAGCCTGAAAGTGTACCTGTTTGCGGAGGACCAAGCTGACCG TTCTAGGCCAGCTTAAAGCCGCCCTAGCGTGACCTGTTCCCTCCAA GCAGCGACTGAGGAACTGAGGCAACAAGGCCACCCCTGCTGTGCGCTGATC AGCGACTTCTATCCTGGCGCCGTGACCTGTGGCCTGGAAAGGCCGATAG CTCTCTGTGAAGGCCGCCGTGGAAACACCAACCCCTAGCAAGCAGA GCAACAAACAAATACGCCGCCAGCAGCTACAGCTGCCAAGTGACCCACGAGGG CAGTGGAAAGTCCCACAGATCTACAGCTGCCAAGTGACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTTACCGAGTGCAGC
381	PRT	EVQLESGGLVQPGGSLRLSCAASGFTFDYEMNWVRQAPGKGLEWV SGISWNSGWIDYADSVKGRFTISRDNKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQGTIVTSS
382	PRT	SYEMN
383	PRT	GISWNSGWIDYADSVKG
384	PRT	SGYSSSWFDPDFDY

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
385	PRT	QSVLTQPPSVGAPGQRVTISCTGSSSDIGAGYDVHWYQQLPGTAKLLI YGNNSNRPSGVPDFRSKSGTSASLAITGLQAEDADYYCSSYAGPNPY VVFGGGTKLTVL
386	PRT	TGSSSDIGAGYDVH
387	PRT	GNSNRP\$
388	PRT	SSYAGPNPYVV
389	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTCACCTTCGATAGCT ACGAGATGAACCTGGGTCGACAGGCCCCCTGGCAAAGGCCCTGAAATG GGTGTCCGGCATCAGCTGGAATAGCGCTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTACACATCAGCCGGGACAAACAGCAAGAACAC CCTGTACTCTGAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTTCA
390	DNA	AGCTACGAGATGAAC
391	DNA	GGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCGACAGCGTGA AGGGC
392	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT
393	DNA	CAGTCTTCTGACACAGCCTCCATCTGTCTGGCGCCCTGGACAG AGAGTGACCACATCAGCTGTACAGGCAGCAGCTCCGATATTGGCGCCGG ATACGACGTGACTGTTATCAGCACTGCTGGCACAGCCCTAACG TGCTGATCTACGGCAACAGAACAGACCTAGCGGTGCCCCGATAGA TTCAGCGCTTAAGTCGGACAAGCGCAGCTGGCATTACTGG ACTGCAGGCCAGATGAGGCCGACTACTGAGCAGCTACGCTG GCCCAATCCTTACGTGGTTGGCGGAACAAAGCTGACCGTT CTA
394	DNA	ACAGGCACCGAGCTCCGATATTGGGCCCGGATACGACGTGCAC
395	DNA	GGCAACAGCAACAGACCTAGC
396	DNA	AGCAGCTACGCTGGCCCCAATCCTTACGTGGTG
397	PRT	EVQLLESGGGLVQPQGGSLRLSCAASGFTFDSEYEMNWRQAPGKGLEWV SGISWNSGWIDYADSVKGRFTISRDNSKNTLYLQMSNLRAEDTAVYYC ARSGVSSWFDPDFDYWGQTLTVTSSASTKGPSVFPPLAPSSKSTSGGT AALGCLVKDYPPEPVTSWNSGALTSGVHTFPAVLQSLGSLVLSVVTV PSSSLGTQTYICNVNHPSNTKVDKVVEPKSCDKTHTCPPCPAPELLGGP SVFLFPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTPKPREPVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNG QPVENNYKTPPVLDSDGSFFLYSKLTVDSRWWQQGNVFSCSVMHEALH NHYTQKSLSLSPKG
398	PRT	QSVLTQPPSVGAPGQRVTISCTGSSSDIGAGYDVHWYQQLPGTAKLLI YGNNSNRPSGVPDFRSKSGTSASLAITGLQAEDADYYCSSYAGPNPY VVFGGGTKLTVLQGQPKAAPSVTLFPPSSEELQANKATLVLISDFYPGAV TVAWKADSSPVKAGVETTTPSKQSNNKYAASSYLSLTPEQWKSHRSYS CQVTHEGSTVEKTVAPTECS
399	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCAGCGGCTTCACCTTCGATAGCT ACGAGATGAACCTGGGTCGACAGGCCCCCTGGCAAAGGCCCTGAAATG GGTGTCCGGCATCAGCTGGAATAGCGGTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTACACATCAGCCGGGACAACAGCAAGAACAC CCTGTACTCTGAGATGAACAGCCTGAGAGGCCGAGGACACGCCGTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGCTTCA CACCAAGGGCCCCAGCGTGTCCCTCTGGCCCCTAGCAGCAAGAGCA CATCTGGCGGAACAGCGCCCTGGCTGCCTCGTGAAGGACTACTTT CCCGAGCCCGTGAACCGTGTCTGGAAACTCTGGCCTGACAAAGCGG CGTGCACACCTTCCAGCCGTGTCAGAGCAGCGGCTGTACTCTCT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
400	DNA	GAGCAGCGTCGTGACAGTGGCCAGCAGCTCTGGCACCCAGACCT ACATCTGCAACGTGAACCCAAGGCCAGCAACACCAAGGTGGACAA GAAGGTGGAACCCAAGAGCTGCGACAAGGCCACACCTGTCCCCCTT GTCCTGCCCCGAACTGCTGGGAGGCCCTCCGTGTTCTGTCCCCC CAAAGCCAAGGACACCCCTGATGATCAGCCGACCCCCGAAAGTGA CTGCGTGGTGGATGTTGCCCACGAGGACCTGAAAGTGAAGTTCA ATTGGTACGTGGACGGCGTGGAAAGTGCAACACGCCAACGACCC TAGAGAGGAACAGTACAACAGCACCTACCGGGTGGTCCGTGCTGA CAGTGTGCAACAGGACTGGCTGAACGCGAAAGAGTACAAGTGC GGTGTCCAACAAGGCCCTGCCTGCCCATCGAGAAAACCACAGCA AGGCCAAGGGCAGGCCAGAACCACAGGTGTACACACTGCCCTTA AGCAGGGACGAGCTGACCAAGAACAGGTGTCCCTGACCTGCTCGT GAAAGGCTTCTACCCCTCCGATATCGCCGTGGAATGGGAGAGCAACG GCCAGCCCGAGAACAACTACAAGACCAACCCCCCTGTGCTGGACAGC GACGGCTCATTTCTCTGTACAGCAAGCTGACCGTGGACAAGTCCG GTGGCAGCAGGGCAACGTGTCAGCTGCAACGCGTGTGACGAGGCC TGCACAACCACTACACCCAGAAGTCCCTGAGCCCTGGCAAG
401	PRT	EVOLLESGGGLVQPQPGSRLSLCAASGFTFDSYEMNWVRQAPGKGLEW SGISWNNSGWIDYADSVKGRFTISRDNSKNLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQQLTVTSS
402	PRT	SYEMN
403	PRT	GISWNNSGWIDYADSVKG
404	PRT	SGYSSSWFDPDFDY
405	PRT	QSVLTOPPSVGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSNRPSPGVDRFSKSCTSASLAITGLQAEDAYYCQSYAGINPY VVFGGGTKLTVL
406	PRT	TGSSSNIGAGYDVH
407	PRT	GNSNRPS
408	PRT	QSYAGINPYVV
409	DNA	GAAGTTCTGAGCTGGAAATCTGGCGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCACCTTCGATAGCT ACGAGATGAACTGGGTCCGACAGGCCCTGGCAAAGGCCCTTGAATG GGTGTCCGGCATCAGCTGGAATAGCGGTGGATCGACTACGCCGACA GGGTGAAAGGGCAGATTCAACCATCAGCCGGACAAAGCAAGAAC CCTGTACCTGCGAGATGACAGCCTGAGAGCCGAGGACACGCCGTG ACTACTGTGCCAGAAGGGCTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTCTCA
410	DNA	AGCTACGAGATGAAC
411	DNA	GGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCGACAGCGTGA AGGGC
412	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT
413	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTGCTGGGCCCTGGACAG AGAGTGACCATCAGCTGACAGGAGCAGCTCCAATTCGGAGCCGG

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		CTATGACGTGCACTGGTATCAGCAGCTGCCCTGGCACAGCCCTAAAC TGCTGATCTACGGCAACAGAACAGACAGCCAGCGCGTGGCGATAGA TTTCGGCTTAAGAGCGGACAAGCGCCAGCCTGGCTATTACTGG ACTGCAGGCCAGGACAGGCCGACTACTACTGTCAAGGCTACGCCG GCATCAACCCCTACGTGGTGTGGGGAGGCACCAAGCTGACAGTT CTA
414	DNA	ACAGGCAGCAGCTCCAATATCGGAGCCGGTATGACGTGCAC
415	DNA	GGCAACAGCAACAGACCAGC
416	DNA	CAGAGCTACGCCGGCATCAACCCCTACGTGGTG
417	PRT	EVQLLESGGLVQPGGSLRLSCAASGFTFDSEMNWVRQAPGKGLEWV SGISWNSSGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARSGWVSSWFDPEFYWGQTLVTSSASTKGPSVFLAPSSKSTSGGT AALGCLVKDYPPEPVTVWSWNSGALTSGVHTFPALVQSSGLYSLSSVTV PSSSLGTQTYIICNVNHPKSNTKVDKVVEPKSCDKTHTCPCCPAPELLGGP SVFLFPKPDKTLMI SRTPETCVVVDVSHEDPEVFKFNWYVDGEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT SKAKGQPREGQVYTLPPSRDELTKNQVSLTCLVKGPYPSDIAVEWESNG QPNENYKTTPPVVLDSGSFFLYSKLTVDKSRWQQGNVFCSVMHEALH NHYTQKSLSLSPKG
418	PRT	QSVLTLQPPSVPVGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSNRPSGVDPDRFSGSKSGTSASLAITGLQAEDEADYYQOSYAGINPY VVFGGGTQLTVLQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPGAV TVAWKADSSPVKAGVETTTPSKQSNNKYAAASSYLSLTPEQWKSHRSYS CQVTHEGSTVEKTVAPTECS
419	DNA	GAAGTTCACTGCTGGAATCTGGCGGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCCCTACCTTCGATAGCT ACGAGATGAACTGGGTCGACAGGCCCTGGCAAAGGCCCTGAATG GGTGTCCGGCATCTGGAAATAGCGCTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTACCATCAGCCGGAACAGCAAGAAC CCTGTACCTGAGATGAACAGCCTGAGAGGCCGAGGACACGCCGTG ACTACTGTCCAGAACCGCTACACAGCTTGTGACCCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTCTCAGCCAG CACCAAGGGCCCAGCGTGTCCCTCTGGCCCTAGCAGCAAGAGCA CATCTGGCGAACAGCGCCCTGGCTGCGCTCGTAAGGACTACTTT CCCGAGCCCCGTGACCGTGTCCAGAACCTGGCGCTCGACAAGCG CGTGCACACCTTCCAGCCGTGCTGCAGAGCAGCGCCTGTACTCT GAGCAGCGTGTGACAGTGCCAGCAGCTCTGGCACCCAGACCT ACATCTGCAACGTGAACCCAAGGCCAGAACACCAAGGGGACAA GAAGGTGAAACCCAAGAGCTGCGAACAGACCCACACCTGTCCCCCT GTCCTGCCCGAACACTGCTGGGAGGCCCTCGTGTCTGTCCCC CAAAGCCAAGGACACCTGTATGATCAGCCGGAACCCCGAAGTGAC CTGCGTGGTGGTGTGTCCCAGGGACCCCTGAAGTGAAAGTTCA ATTGGTACCGTGAACGCCAGAACACCAAGGGGACAA GAAGGTGAAACCCAAGAGCTGCGAACAGACCCACACCTGTCCCC GTCCTGCCCGAACACTGCTGGGAGGCCCTCGTGTCTGTCCCC CAAAGCCAAGGACACCTGTATGATCAGCCGGAACCCCGAAGTGAC CTGCGTGGTGGTGTGTCCCAGGGACCCCTGAAGTGAAAGTTCA ATTGGTACCGTGAACGCCAGAACACCAAGGGGACAA GAAGGTGAAACAGTACAACAGCACCTACCGGGTGTGCGTGT CAGTGTGCTGACCAGGACTGGCTGAACGCAAAGAGTACAAGTGAA GGTGTCCAACAGGCCCTGCTGCCCTACAGGAAACCCATCAGACA AGGCCAAGGGCAGCCCCCGAACCCCGAGGTGACACACTGCC AGCAGGGACAGCTGACCAAGAACAGGTGTCCCTGACCTGTCTGT GAAAGGCTTCTACCCCTCCGATATCGCGTGGAAATGGGAGAGCA GCCAGCCGAGAACACAATCAAGACCCACCCCCCTGTGCTGGACAGC GACGGCTCATTCTCTGTACAGCAGCTGACCCGTGGACAAGTCCC GTGGCAGCGAGGCAACGTGTCAGCTGCAAGCGTGTGCAAGGCC TGCACACCAACTACACCCAGAACGCTCTGAGCCCTGGCAAG
420	DNA	CACTGCTTCTGACACAGCCTCCATCTGTCTGGCGCCCTGGACAG AGAGTACCATCAGCTGTACAGGCAGCTCCAAATATCGGAGCCGG CTATGACGTGCACTGGTATCAGCAGCTGCCCTGGCACAGCCCTAAAC TGCTGATCTACGGCAACAGAACAGACAGCCAGCGCGTGGCGATAGA TTTCGGCTTAAGAGCGGACAAGCGCCAGCCTGGCTATTACTGG ACTGCAGGCCAGGACAGGCCGACTACTACTGTCAAGGCTACGCCG GCATCAACCCCTACGTGGTGTGGGGAGGCACCAAGCTGACAGTT CTAGGCCAGCTAAAGCCGCCCTAGCGTACCCCTGTGCTGT CAGCGAGGAACGTGAGGCAACAGGCACCCCTCGTGTGCTGT GCGACTTCTATCTGGGCCGTGACCGTGGCTGGAAAGGCCGATAGC TCTCTGTGAAGGCCGGTGGAAACCAACCCCTAGCAAGCAGAG

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		CAACAAACAAATACGCCGCCAGCAGCTACCTGAGCCTGACCCCCGAGC AGTGGAAAGTCCCACAGATCCTACAGCTGCCAAGTGACCCACGAGGGC AGCACCGTGGAAAAGACAGTGGCCCTACCGAGTCAGC
421	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFDFSSYEMNWVRQAPGKLEWV SGISWNNSGWIGYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQGTLVTVSS
422	PRT	SYEMN
423	PRT	GISWNNSGWIGYADSVKG
424	PRT	SGYSSSWFDPDFD
425	PRT	QSVLTOPPSVSGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAKLLI YGNNSNRPSGVPDFRSKSGTSASLAI TGQAEDAEADYYCQSYAGPNPY VVFGGGTKLT
426	PRT	TGSSSNIGAGYDVH
427	PRT	GNSNRPS
428	PRT	QSYAGPNPYVV
429	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGGACTGGTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCGATTCAGCAGCT ACGAGATGAACGGGCTCGAGCAGGCCCTGGCAAAGGCCCTGAATG GGTGTCCGGCATCAGCTGGATAGCGCTGGATCGGCTACGGCGATA GCGTGAAGGGCAGATTACCATCAGCGGGACAACAGCAAGAACAC CCTGTA CTCAGATGAAACAGCTGAGAGCGGAGGACACGCCCTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTTGGTTGACCCCGAC TTCACTATTGGGGCAGGGCACACTGGTACAGTCTCTCA
430	DNA	AGCTACGAGATGAAC
431	DNA	GGCATCAGCTGGAATAGCGGCTGGATCGGCTACGCCGATAGCGTGAAGGGC
432	DNA	AGCGGCCTACAGCAGCTTGGTTGACCCGACTTCGACTAT
433	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGGCCCTGGCAG AGAGT GACCATCAGCTGACTGGTATCAGCAGCTGCCTGGCACAGGCCCTAAAC CTATGACGTGACTGGTATCAGCAGCTGCCTGGCACAGGCCCTAAAC TGCTGACTACGGCAACAGAACAGACCCAGCGCGTGCCCGATAGA TTTCCGGCTTAAGAGCGGCACAAGGCCAGCCTGGCTATTACTGG ACTGCAAGGCCAGGGACAGGCCGACTACTACTGTCACTTACGCTG GCCCAATCCTAACGTGGTTGGCGCGGAACAAAGCTGACCGTT CTA
434	DNA	ACAGGCAGCAGCTCCAATATCGGAGCCGGCTATGACGTGCAC
435	DNA	GGCAACAGCAACAGACCCAGC
436	DNA	CAGTCTTACGCTGGCCCAATCCTAACGTGGT
437	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFDFSSYEMNWVRQAPGKLEWV SGISWNNSGWIGYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQGTLVTVSSASTKGPSVPLAPSSKSTSGGT AALGCLVKDYPPEPVTVWSNSGALTSGVHTFPAVLQSSGLYSLSSVTV PSSSLGTQTYI CNVNHHPSNTKVDKVVEPKSCDKTHTCPCCPAPELLGGP SVFLPPPKPKDTLMISRTPETVCFVVDVSHEDEPEVKFNWVVDGVEVHNA KTKPREEQYNTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTI SKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNG QFENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPGK
438	PRT	QSVLTOPPSVSGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAKLLI YGNNSNRPSGVPDFRSKSGTSASLAI TGQAEDAEADYYCQSYAGPNPY VVFGGGTKLT VLGQPKAAPS VTFPPSSEELQANKATLVCLISDFY PGAV TVAWKADSSPVKAGVETTPSKQSNNKYAASSYLSLPEQWKSHRSYS CQVTHEGSTVEKTVAPTECS

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No.	SEQ Type	SEQUENCE
439	DNA	GAAGTTCACTGCTGGAAATCTGGCGCCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGGCCCTTCGATTTCAGCAGCT ACGAGATGAACCTGGGTCGACAGGCCCTGGCAAAGGGCTTGAAATG GGTGTCCGGCATCAGCTGGAAATAGCGCTGGATCGGCTACGCCGATA GCGTGAAGGGCAGATTCAACCATCAGCCGGACAACAGCAAGAACAC CCTGTAACCTGCAGATGAACAGCCTGAGAGCCGAGGACACGCCGCTGT ACTACTGTGCCAGAAGGGCTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGCTCTCAGCAG CACCAAGGGCCCCAGCGTGTCCCTCTGGCCCCTAGCAGCAAGAGCA CATCTGGCGGAACAGCGCCCTGGCTGCGTGAAGGACTACTTT CCCGTGAAGGCCGAGCTGGCTGGGACTCTGGCGCTCTGACAAGCGG CGTGCACACCTTCCAGCCGTGCTGAGCAGCGCCGCTGTACTCTCT GAGCAGCGTGTGACAGTGCCCAGCAGCTCTGGCACCCAGACCT ACATCTGCAACGTGAAACCCAAGGCCAGAACACCAAGGTGGACAA GAAGGTGGAACCCCAAGAGCTGCGACAAGGCCACACCTGTCCCCCTT GTCCTGCCCGGAACACTGCTGGGAGGCCCTTCGCTGTTCTGTTCCCC CAAAGCCCAAGGACACCCCTGATGATCAGCGGGAACCCCGAAGTGA CTGCGTGTGTGGATGTGTCCCAGGGACCCCTGAAGTGAAGTTCA ATTGGTACAGTGGACGGCTGTTGGAAAGTGCACAACAGCCAAGGAC TAGAGAGGAACAGTAACACGACACTACCGGGTGGTGTCCGTGCTGA CAGTGTGACCAGGACTGGCTGAACGCAAAGAGTACAAGTCAA GGTGTCAAACAAGGCCCTGCTGCCCATCGAGAAAACCATCAGCA AGGCCAAGGGCCAGGCCAGGCCACAGCCAGGTGACACACTGCCCG AGCAGGGACGAGCTGACCAAGAACAGGTGCTCCCTGACCTGTCTGT GAAAGGCTTCTACCCCTCCGATATCGCGTGGAAATGGGAGAGCAAG GCCAGCCGAGAACAACTACAAGACCAACCCCCCTGTGCTGGACAGC GACGGCTATTCTCTGTACAGCAAGCTGACCGTGGACAAGTCCG GTGGCAGCAGGGCACAGTGTGGTCAAGCTGAGTGCACGAGGCC TCACAAACCAACTACGCCGCCAGCAGCTACCTGAGCCTGACCCCCAG AGTGGAAAGTCCCACAGATCTACAGCTGCAAGTGACCCACGAGGGC AGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAG
440	DNA	CAGTCTTTCTGACACAGCTCCATCTGGTCTGGCGCCCTGGACAG AGAGTGGACATCAGCTGACAGCAGCTCCAAATATCGGAGCGG CTATGACGTGACTGGTATCAGCAGCTGCTGGCACAGGCCCTAAAC TGCTGATCTACGGCAACAGAACAGACCCAGCGCGTGGCGATAGA TTGGCGCTCTAAGAGCGGCAACAGCGCAGCCCTGGCTTACTGG ACTCCAGGCCAGGGACGGCCACTACTCTGAGCTTACCGCTG GCCCAATCTTACGTGGTTGGCGCGAACAAAGCTGACCGTT CTAGGCCAGCTAAAGCCGCCCTAGCGTGACCCCTGTCCTCCAAG CAGCAGGAACCTGCAGCCAAACAGGCCACCCCTCGTGTGCTGATCA GCGACTTCTATCCTGGCGCGTGGCTGACCGTGGCTGGAAGGCCGATAGC TCTCTGTGAAGGCCGCCGTGGAAACACACACCCCTAGAAGCAGAG CAACAACAAATACGCCGCCAGCAGCTACCTGAGCCTGACCCCCAG AGTGGAAAGTCCCACAGATCTACAGCTGCAAGTGACCCACGAGGGC AGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAG
441	PRT	EVQLESGGGLVQPQPGSLRLSCAASGFDFSSYEMNWRQAPGKGLEWV SGISWNNGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQGTLVTVSS
442	PRT	SYEMN
443	PRT	GISWNNGWIDYADSVKG
444	PRT	SGYSSSWFDPDFDY
445	PRT	QSVLTQPPSVGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSNRPSGVPDFRFSGSKSGTSASLAITGLQAEDAYYCQSYAGPNPY VVFGGGTKLTVL
446	PRT	TGSSSNIGAGYDVH
447	PRT	GNSNRPSS
448	PRT	QSYAGPNPYVV
449	DNA	GAAGTTCACTGCTGGAAATCTGGCGCCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGGCCCTTCGATTTCAGCAGCT ACGAGATGAACCTGGGTCGACAGGCCCTGGCAAAGGGCTTGAAATG GGTGTCCGGCATCAGCTGGAAATAGCGCTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTCAACCATCAGCCGGACAACAGCAAGAACAC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
450	DNA	CCTGTACCTGCAAGATGAACAGCCTGAGAGCCGAGGACACCGCCGTGT ACTACTGTGCCAGAACGGCTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGCCAGGGCACACTGGTCACAGTCTTCA
451	DNA	AGCTACGAGATGAAC
452	DNA	GGCATCAGCTGAAATAGCGGCTGGATCGACTACGCCGACAGCGTGA AGGGC
453	DNA	AGCGGCTACAGCAGCTCTGGTTGACCCGACTTCGACTAT
454	DNA	CAGTCTTCTGACACAGCCTCCATCTGTCTGGCCCCCTGGACAG AGAGTGACCACAGCTGACAGGCAGCAGCTCAAATATCGGAGCCGG CTATGACGTGACTGGTATCAGCAGCTGCTGGCACAGCCCTAAAC TGCTGATCTACGGCAACAGAACAGACCCAGCGCGTGGCGATAAGA TTTCCGGCTTAAGAGCGGACAAGCGCAGCCCTGGCTATTACTGG ACTGCAGGCCAGGACGAGGCCGACTACTACTGTCACTTACGCTG GCCCAATCCTACGTGGTTGGCGCGAACAAAGCTGACCGTT CTA
455	DNA	ACAGGCAGCAGCTCCAATATCGGAGCCGGCTATGACGTGCAC
456	DNA	GGCAACAGCAACAGACCCAGC
457	PRT	CAGTCTTACGCTGGCCCCAATCCTTACGTGGTG
458	PRT	EVQLESGGGLVQPGGSLRLSCAASGFDFSSYEMNWRQAPGKGLEWV SGISWNNSGWIDYADSVKGRFTISRDNSKNLTLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQQLTVTSSASTKGPSVPLAPSSKSTSGGT AALGCLVKDYPPEPVTSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTV PSSSLGTQTYICNVNHNPSNTKVDKVKEPKSCDKTHTCPGPCPAELLGGP SVFLPPKPKDTLMISRTPEVTCVVDVSHEDPEVKFNWVVDGVVEVHNA KTKPREEQYNSTYRVVSVLVLHQDWLNGKEYKCKVSNKALPAPIEKTI SKAKGQPREGPOVYTLPEPSRDELTKNQSLTCLVKGFYPSDIAVEWESNG QPNENNYKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFCSVHEALH NHYTQKSLSLSPGK
459	DNA	QSVLTQPPSVGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKL YGNNSRNPSGVDRFSGSKSGTSASLAITGLQAEDEADYYCOSYAGPNPY VVFGGGTQLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLISDFY PGAVTVAWKADSSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYS CQVTHEGSTVEKTVAPTECS

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		AGCAGGGACGAGCTGACAAGAACCGAGGTGTCCTGACCTGTCTCGT GAAAGGCTTCTACCCCTCCGATATCGCGTGGAAATGGGAGAGCAACG GCCAGGCCGAAACAACTACAAGAACCCCCCTGTGCTGGACAGC GACGGCTCATTTCTCTGTACAGCAAGCTGACCGTGGACAAGTCCC GTGGCACGGCAACGTGTTCAAGCTGCACCGTGATGCACGGGCC TGCACAAACCACATACACCCAGAACGTCCTGAGCCTGAGGCC TGGCAAG
460	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGCGCCCTGGACAG AGAGTGACCATCAGCTGTACAGGCAAGCAGCTCCAAATATCGGAGCGG CTATGACGTGACTGGTATCAGCAGCTGGCTGGCACAGGCCCTAAAC TGCTGATCTACGGCAACAGAACAGACCCAGCAGCGCTGCCGATAGA TTTCCGGCTCTAAAGAGCGGCACAAGGCCAGCCTGGCTTACTG ACTGCAAGGCCAGGGACAGGCCGACTACTACTGTCAAGTCTACCGT GCCCAATCCTTACGTGGTGTGGCGCGAACAAAGCTGACCGTT CTAGGCCAGCTAAAGCCGCCCTAGCGTACCCCTGTTCCTCCAAG CAGCGAGGAACCTGCAAGGCCAACAGGCCACCCCTGTGCTGATCA GGCACTCTATCTGGCGCGTGTGGCTGGAAAGGCCGATAGC TCTCCTGTGAAGGCCGGCTGGAAACACCACCCCTAGCAAGCAGAG CAACAAACAAATACGCCGCCAGCTACCTGAGCTGACCCCGAGC AGTGGAAAGTCCCACAGATCTACAGCTGCAAGTGACCCACGAGGGC AGCACCGTGGAAAAGACAGTGGCCCTTACCGAGTGCAGCAGC
461	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFDSEMNWVRQAPGKLEWV SGISWNNSGWIDYADSVKGRFTISRDNSKNLTLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQGTLVTVSS
462	PRT	SYEMN
463	PRT	GISWNNSGWIDYADSVKG
464	PRT	SGYSSSWFDPDFDY
465	PRT	QSVLTQPPSVPVGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSNRSGVPDRFSKSGTSASLAITGLQAEDADYYCQSYAGPNPY VVFGGGTKLTVL
466	PRT	TGSSSNIGAGYDVH
467	PRT	GNSNRPS
468	PRT	QSYAGPNPYVV
469	DNA	GAAGTTCAAGCTGCTGGAATCTGGCGGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCCCTCACCTTGTGATAGCT ACGAGATGAACTGGGTCCGACAGGCCCTGGCAAAGGCCCTGAATG GGTGTGGCATCTAGCTGGAAATAGCGCTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTACCATCAGCCGGACAACAGCAAGAAC CCTGTACCTGCAGATGAACAGCCTGAGAGCGAGGACACGCCGTGT ACTACTGTGCCAGAAGCGGTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTCACAGTCTCTTCA
470	DNA	AGCTACGAGATGAAC
471	DNA	GGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCGACAGCGTGA AGGGC
472	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT
473	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGCGCCCTGGACAG AGAGTGACCATCAGCTGTACAGGCAAGCAGCTCCAAATATCGGAGCGG CTATGACGTGCACTGGTATCAGCAGCTGGCTGGCACAGGCCCTAAAC TGCTGATCTACGGCAACAGAACAGACCCAGCAGCGCTGCCGATAGA TTTCCGGCTCTAAAGAGCGGCACAAGGCCAGCGCTGGCTTACTG ACTGCAAGGCCAGGGACAGGCCGACTACTACTGTCAAGTCTACCGT GCCCAATCCTTACGTGGTGTGGCGCGAACAAAGCTGACCCGTT CTA
474	DNA	ACAGGCAGCAGCTCCAATATCGGAGCCGGCTATGACGTGCAC
475	DNA	GGCAACAGCAACAGACCCAGC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
476	DNA	CAGTCTTACGCTGGCCCCAATCCTTACGTGGTG
477	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFDFDSYEMNWVRQAPGKLEW SGISWNSGWIDYADSVKGRFTISRDN SKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYGQGTLTVTSSASTKGPSVPLAPSSKSTSGGT AALGCLVKDVFPEPVTSWNSGALTSGVHTFP AVLQSGS GLYLSVSSVTV PSSSLGTQTYI CNVNHNKPSTNKTVDKKVEPKSCDKTHTCPCCPAPELLGGP SVFLFPKPKD TLMISRTPEVTCVVVDVSHEDEPKVFNWYDVGEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT SKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGVF YPSDI AVEWESNG OPENNYKTTTPVVLDSGSFFFLYSKLTVDKSRWQQGNVFCSVMHEALH NHYTQKSLSLSPKG
478	PRT	QSVLTQPPSVSGAPGQRTV I S CTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSRNPSGVDRFSGSKSGTSASLAITGLQAED EADYYCQSYAGPNPY VVFGGGTKLTVLGQPKAAPS VTLFPPSSEELQANKATLVCLISDFYPGAV TVAVKADSSSPVKA GVE TTPSKQSNNKYAASSYLSLTPEQWKSHRSYS CQVTHEGSTVEKTVAPTECS
479	DNA	GAAGTTCAGCTGCTGGAA TCTGGCGCCGGA C TGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCTTCA CCTCGATA GCT ACGAGATGA ACTGGGTC CGA CAGGCCCCTGCA AAGGCCTTGAATG GGTGTCCGGCATCAGCTGGAA ATAGCGCTG GATCGACTACGCCGACA GCGTGAAGGGCAGATT CACCATCAGCCGGACAAACAGCAAGAACAC CCTGTA CTCAGATGAACAGCCTGAGAGCGGAGGACACGGCGTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTTGGTTGACCCGAC TTCGACTATTGGGGCAGGGCACACTGGTCA CAGTCTCTCAGCCAG CACCAAGGGCC CAGCTGTTCCCTCTGGCCCTAGCAGCAAGAGCA CATCTGGCGGAACAGCCGGCTGGCTGCCTCGTGAAGGACTACTTT CCGACCCGTGACCGTGTCTGGAACTCTGGCCTCTGACAAGGG CGTGACACCTTCCAGCCGTGCTGAGAGCAGCGCCTGTACTCT GAGCACCGTCTGACAGTGGCAGCTCTGGCACCCAGCT ACATCTGCAACAGTGAACACAAGGCCAGCAACACAAGGTGGACAA GAAGGTGGAACCCAAGGCTGCGACAAGGCCCACACTGTCCCCCT GT CCTGCCCGA ACTGCTGGAGGCCCTCCGTGTTCCCTGTTCCCC CAAAGCCC AAGGACACCCGTGATGTCAGCGGACCCCGAAGT GAC CTCGTGTGTTGATGTGTCCTCAGCGGACCCCTGAAGTGAAGTCA ATTGGTACGTGGACGGCTGGAAGTGCACAACGCCAAGGCAAGCC TAGAGAGGAACAGTACAACAGCACCTACCGGTGGTGTCCGTGCTGA CAGTGTGCA CAGGACTGGTGAAGGCAAAAGACTACAAGT GCAA GGTGTCAAACAAGGCCCTGCTGCCCATCGAGAAAACCATCAGCA AGGCCAAGGGC CAGCCCGGAACCCCAAGGTGTACACACTGCC AGCAGGGACGAGCTGACCAAGAACAGGTGTCCTGACCTGTCTCGT GAAAGGCTTCTACCCCTCCGATATCGCGTGGAAATGGAGAGCAACG GCCAGCCCGAGAACAAACTACAAGGACACCCCGCTGCTGGACAGC GACGGCTCATTTCTCTGTA CAGCAAGCTGACCGTGGACAGTCCCG GTGGCAGGGCAACGTGTTAGCTGCA CGGTGATGCA CAGGGCC TGCACAACCAACTACACCAGAAGTCCCTGAGCCTGAGGCCCTGGCAAG
480	DNA	CAGTCTTCTGACACAGCCTCCATCTGTGTC TGGCGCCCTGGACAG AGAGT GACCATCAGCTG TACAGG CAGCAGCTCCAA TATCGGAGCCG CTATGAGCTGCACTGGTATCAGCAGCTGCTGGCACAGCCCTAAAC TGCTGATCTACGGCAACAGCAACAGCCAGCGGCTGGCGATAGA TTTCCGGCTTAAGAGCGGCA CAGCGCAGGCTGGCTTACTGG ACTGCAGGCCAGGAGCAGGCCGACTACTACTGTCA GTCTTACGCTG GCCCAACTCTACGTGGTTGGCGCCGAACAAAGCTGACCGTT CTAGGCCAGCTTAAAGCGCCCTAGCGTGA CCCTGTCCTCC CAGCAGGGAACTGCGGCCAACAGGCCACCCCTGTGCTGATCA GCGACTTCTATCCCTGGCGCGT GACCGTGGCCTGGAAAGGCCGATAGC TCTCCGTGAAGGCCCGTGGAAACCA CACCCCTAGCAAGCAGAG CAACAAACAAATACGCCCGCAGCAGCTACCTGAGCCTGACCCCGAGC AGTGGAAAGTCCCAAGATCTACAGCTGCAAGT GACCCACGAGGGC AGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGAGC
481	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFDFDSYEMNWVRQAPGKLEW SGISWNSGWIDYADSVKGRFTISRDN SKNTLYLQMNSLRAEDTAVYY CARSGYSSSWFDPDFDYGQGTLTVSS
482	PRT	SYEMN
483	PRT	GISWN SGWIDYADSVKG

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No.	SEQ Type	SEQUENCE
484	PRT	SGYSSSWFDPDFDY
485	PRT	QSVLTQPPSVGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSNRPSGVPDFSGSKSGTSASLAITGLQAEDADYYCQSYAGPNPY VVFGGGTKLTVL
486	PRT	TGSSSNIGAGYDVH
487	PRT	GNSNRPSS
488	PRT	QSYAGPNPYVV
489	DNA	GAAGTTCAGCTGCTGGAATCTGGCGGCCGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCGCCAGCGGCTTCGACTTCGATAGCT ACGAGATGAACCTGGGTCGCAGAGGCCCTGGCAAAGGCCCTTGAATG GGTGTCCGGCATCAGCTGGAAATAGCGCTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTACCATCAGCCGGACAACAGCAAGAACAC CCTGTACTCTGCAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTCTTGGTTGACCCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTCTTC
490	DNA	AGCTACAGAGATGAAC
491	DNA	GGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCGACAGCGTGA AGGGC
492	DNA	AGCGGCTACAGCAGCTTGGTTGACCCCACCTCGACTAT
493	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGCGCCCTGGACAG AGAGTGACCATCAGCTGTACAGGCAGCAGCTCCAATATCGGAGCCGG CTATGAGCTGACTGTTATCAGCAGCTGGCACAGGCCCTAAAC TGCTGATCTACGGCAACAGCAACAGCCCAGCGGTGCCCCGATAGA TTTCCGGCTTAAGAGCGGCCACAAGCGCAGCCTGGCTTACTGG ACTGCAGGCCAGGGACGAGGCCACTACTGTCACTTACGCTG GCCCCAATCCTTACGTGGTTGGCGCGAACAAAGCTGACCCGTT CTA
494	DNA	ACAGGCAGCAGCTCCAATATCGGAGCCGCTATGACGTGCAC
495	DNA	GGCAACAGCAACAGACCCAGC
496	DNA	CAGTCTTACGCTGGCCCCAATCCTTACGTGGTG
497	PRT	EVOLLESGGGLVQPQGSRLSCAASGFDYEMNWVRQAPKGLEW VSGISWNWSGWIDYADSVKGRFTISRDNSKNLTYLOMNSLRAEDTAVYY CARSGYSSWFDPDFDYWGQGLTVTSSASTKGPSVFLAPSSKSTS TAALGLCLVKDVFPEPVTVSWSNSGALTSGVHTFPAVLQSSGLYSLS VPSSSLGTQTYICNVNHPKSNTKVDKVEPKSCDKTHCPCPAPEL PSVFLPPKPKDTLMSRTPEVTCVVVDVSHEDPVFKFNWYVDGV AKTKPREGQYNSTYRVSVLTVLHQDWLNGKEYKCKVSNKALP TISKAKGQPREGQVYTLPPSRDELTKNQVSLTCLVKGFYPS GQPENNYKTTPVVLDSGGSFLYPSKLTVDKSRWQQGNV HNHYTQKSLSLSPGK
498	PRT	QSVLTQPPSVGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSNRPSGVPDFSGSKSGTSASLAITGLQAEDADYYCQSYAGPNPY VVFGGGTKLTVLGQPKAAPSVTLFPPSEELQANKATLVCLISDFYP GAVTVAWKADSSPVKAGVETTTPSKQSNNKYAASSYSLTPEQWKSHRS SQCQVTHEGSTVEKTVAPTECS
499	DNA	GAAGTTCAGCTGCTGGAATCTGGCGGCCGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCGCCAGCGGCTTCGACTTCGATAGCT ACGAGATGAACCTGGGTCGCAGAGGCCCTGGCAAAGGCCCTTGAATG GGTGTCCGGCATCAGCTGGAAATAGCGGCTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTACCATCAGCCGGACAACAGCAAGAACAC CCTGTACTCTGCAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTCTTGGTTGACCCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTCTCAGCCAG CACCAAGGGCCCCAGCGTGTCCCTGGCCCCTAGCAGCAAGAGCA CATCTGGCGAACAGCGCCCTGGGCTGCGCTCGTGAAGGACTACTTT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		CCCGAGCCCGTGAACCGTGTCTGGAACTCTGGCGCTTGACAAGCGG CGTGACACCTTCCAGCCGTGCTGAGCAGCAGCGGCCTGTACTCTCT GAGCACGGCTGTGACAGTGGCCAGCAGCTCTGGGACCCAGACCT ACATCTGCAACGTGAAACCCAAGGCCAGCAACCAAGGTGGACAA GAAGGTGGAACCCAAGAGCTGCGACAAGGCCACACCTGTCCTCCC GTCCTGCCCGAAGCTGCTGGAGGCCCTCCGTGTTCTGTTCCTCCC CAAAGCCAAGGACACCTGTATGATCAGCCGACCCCGAAGTGTAC CTGCGTGGTGGGATGTGCCCCACGGGACCCCTGAAGTGAAGTTC ATTGGTACGTGGAACGGCTGGAAAGTGCACAAACGCCAACCAAGCC TAGAGAGGAACAGTACAACAGCACCTACCGGTGGTGTCCGTGCTGA CAGTGTGACACAGGACTGGCTGAACGGAAAGAGTACAAGTGCAA GGTGTCCAACAAGGCCCTGCCTGCCCATCGAGAAAACCATCAGCA AGGCCAACGGGCCAGGCCAACAGGCCACCTGTGACACACTGCC AGCAGGGACGAGCTGACAAGAACAGGGTGTCCCTGACCTGTGCGT GAAAGGCTTCTACCCCTCCGATATGCCGTGGAATGGGAGAGAACG GCCAGCCCCGAGAACACTACAAGAACCCCCCCCCTGTGCTGGACAGC GACGGCTCATTTCTCTGTACAGCAAGCTGACCGTGGACAGTCCCG GTGGCAGCAGGGCAACGTGTTAGCTGCGCTGAGCTGACGAGGCC TCACAACCACACCCAGAACAGTCCCTGAGCCTGAGGCCCTGGCAAG
500	DNA	CAGTCTTCTGACACAGCCTCCATCTGTGCTGGGCCCTGGACAG AGAGTGACCATCAGCTGACAGCGACAGCTCCAAATATCGAGCGG CTATGAGCTGCACTGTTATCAGCAGCTGCCCTGGCACAGCCCTAAAC TGATGACTACGGCAACAGCAACAGGCCAGCGGGCTGGCGATAGA TTTCCGGCTTAAGAGCGGCAACAAGGCCAGCTGGCTTATTACTGG ACTGCAGGCCAGGACGAGGCCGACTACTGTGAGTCTTACGCTG GCCCAATCCTAACGTGGTTGGCGCGAACAAAGCTGACCGTT CTAGGCCAGCTAAAGCGCCCTAACGTGACCCCTGTCCCTCCAAG CAGCGAGGAACCTGAGGCCAACAGGCCACCTCGTGTGCGTGTGATCA GCGACTTCTATCTGGCCGTGACCGTGGCTGGAAAGGCCGATAGC TCTCCTGTAAGGCCGGTGGAAACCACCCCTAGCAAGCAGAG CAACAAACAAATACGCCAGCAGCAGTACCTGAGCTGACCCACGAGGC AGTGGAAAGTCCCACAGTCTACAGTGCAGTGCAGCTGACGCCAGGGC AGCACCGTGGAAAAGAACAGTGGCCCTACCGAGTGTGAGC
501	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFDSYEMNWVRQAPGKGLEWV SGISWNNSGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQQLTVTVSS
502	PRT	SYEMN
503	PRT	GISWNNSGWIDYADSVKG
504	PRT	SGYSSSWFDPDFDY
505	PRT	QSVLTOPPSVSGAPGQRVTISCTGSSSDIGAGYDVHWYQOLPGTAKLLI YGNNSRPGVPDRFSGSKSGTSASLAITGLQAEDAYYCQSYAGINPY VVFGGGKLTVL
506	PRT	TGSSSDIGAGYDVH
507	PRT	GNSNRPS
508	PRT	QSYAGINPYVV
509	DNA	GAAGTTCTAGCTGCTGGAATCTGGCGGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCACTTCGATAGCT ACGAGATGAACGGGTCCGACAGGCCCTGGCAAAGGCCCTGAAATG GGTGTCCGGCATCAGCTGAATAGCGGCTGGATCGACTACGCCGACA CGGTGAAGGGCAGATTCAACCATCAGCCGGACAACAGCAAGAAC CCTGTACCTGCAAGATGACAGCAGCTGAGAGGCCAGGACACGCCGTGT ACTACTGTGCCAGAACGGGCTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTCTTCA
510	DNA	AGCTACGAGATGAAC
511	DNA	GGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCGACAGCGTGA AGGGC
512	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
513	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGGCCCTGGACAG AGAGTGACCATCAGCTGTACAGGCAGCAGCTCCGATATTGGCGCCGG ATACGACGTGCACTGGTATCAGCAACTGGCTGGCACAGGCCCTAACG TGCTGATCTACGGCAACAGCAACAGACCTAGCGGCTGGCGATAGA TTCAGGGCTTAAGTCTGGCACAGCCAGCTGGGATTACTGG ACTGCAGGCCGAAGATGAGGCCGACTACTACTGTGAGAGTACGCCG GCATCAACCCCTACGTGGTTGGGGAGGCACCAAGCTGACAGTT CTA
514	DNA	ACAGGCAGCAGCTCCGATATTGGCGCCGGATACGACGTGCAC
515	DNA	GGCAACAGCAACAGACCTAGC
516	DNA	CAGAGCTACGCCGGCATCAACCCCTACGTGGTG
517	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFDSYEMNWVRQAPGKLEWV SGISWNNGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYVC ARSGYSSSWFPDFDWFYWGQQLTVTSSASTKGPSVFPLAPSSKSTSGGT AALGCLVKDYPFEPVTVWSNGLTSVHFTPAVLQSSGLYSSLSSVTV PSSSLGTQTYICNVNHPKSNTVKDKVEPKSCDKTHTCPCCPAPELLGGP SVFLFPKPDKTLMSRTPETCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT SKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNG QPVNNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPGK
518	PRT	QSVLTQPSPVSGAPGQRVTISCTGSSDIGAGYDVHWYQQLPGTAKILLI YGNNSRNSRGVPDRFSGSKSGTSASLAITGLQAEDBADDYQOSYAGINPY VVFGGGTQLTVLGQPKAPSVTLFPPSSEELQANKATLVCLISDFYPGAV TVAWKADSSPVKAGVETTTPSKQSNNKYAASSYLSLTPEQWKSHRSYS CQVTHEGSTVEKTVAPTECS
519	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAGCGCTTACACCTTCGATAGCT ACGAGATGAACGGGTCGACAGGCCCTGGCAAAGGCCCTGAATG GGTGTGGCATCAGCTGGAAATAGCGCTGGATCGACTACGCCGACA GCCGTAAAGGGCAGATTCAACCATCACCCGGACAACAGCAAGAACAC CCTGTAACCTGCAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCCAGAAGCCGCTACAGCAGCTTGGTTGACCCCGAC TTCGAGTATTGGGGCAGGGCACACTGGTACACAGTCTCTCAGCCAG CACCAAGGGCCCGAGCTGGCTGGCCCTAGCAGCAAGAGCA CATCTGGCGAACAGCCCTGGCTCGTGAAGGACTACTTT CCCGAGCCGTGACCGTGTCTGGAACTCTGGCGCTCGACAAGCGG CGTGCACACTTCCAGCCGTGCTGAGCAGCCGCGCTGTACTCTCT GAGCAGCGTGTGACAGTGGCCAGCAGCTCTGGCACCCAGACCT ACATCTGCAACGTGAACACAAGCCAGAACACCAAGGTGGACAA GAAGGTGGAACCCAAGAGCTGCGACAAGACCCACACCTGTCCCCCTT GTCCTGCCCCCAGACTGCTGGGAGGCCCTTCGTTCTGTTCTGTTCCCC CAAAGCCCAAGGACACCTGTGATGACCGCCGACCCCGAAGTGA CTGCGTGGTGGATGTGTCCCAGGAGCCCTGAAAGTGAAGGTTCA ATTGGTACGTGGACGGCGTGGAAAGTGCACAACGCCAACAGACCC TAGAGAGGAACAGTACAACAGCACCTACCGGGTGGTGTCCGTGCTGA CACTGCTGACACAGGACTGGCTGAACGGAAAGAGTACAAGTGC GGTGTCCAACAAAGGCCCTGCTGCCCTACATGAGAAAACCATCAGCA AGGCCAAGGGCCAGCCCGCAACCCAGGTGACACACTGCCCTCA AGCAGGGACGAGCTGACCAAGAACCCAGGTGCTCCCTGACCTGTCTGT GAAAGGCTCTACCCCTCCGATATCGCCGTGGAATGGGAGAGCAACG GCCAGCCGAGAACACTAACAGAACCCCCCTGTGGTGGACAGC GACGGCTATTCTCCCTGTACAGCAAGCTGACCGTGATGCACGGCC GTGGCACAGGGCAACGTGTTGAGCTGACGGTGATGCACGGCC TGCACAACCAACTACACCCAGAAGTCCCTGAGCCTGAGCCCTGGCAAG
520	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGGCCCTGGACAG AGAGTGACCATCAGCTGTACAGGCAGCAGCTCCGATATTGGCGCCGG ATACGACGTGCACTGGTATCAGCAACTGGCTGGCACAGGCCCTAACG TGCTGATCTACGGCAACAGCAACAGACCTAGCGGCTGGCGATAGA TTCAGGGCTTAAGTCTGGCACAGCCAGCTGGGATTACTGG ACTGCAGGCCGAAGATGAGGCCGACTACTACTGTGAGAGTACGCCG GCATCAACCCCTACGTGGTTGGCGAGGCACCAAGCTGACAGTT CTAGGCCAGCTAAAGCCGCCCTAGCGTGACCCCTGTTCCCTCAAG CAGCGAGGAACATGCAGGCCAACAGGCCACCCCTGCTGCTGATCA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GCGACTTCTATCCTGGCCCGTGACCGTGGCCTGGAAAGGCCGATAGC TCTCCTGTGAAGGCCGGCTGGAAACCACCCCTAGCAAGCAGAG CAACACAAAATACGCCCGCAGCAGCTACCTTGAGCTGACCCCCGAGC AGTGGAAAGTCCCACAGATCCTACAGTGCCAAGTGACCCACGGGGC AGCACCGTGGAAAAGACAGTGCCCCAACCGAGTCAGC
521	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFDFDSYEMNWVRQAPGKLEW VSGISWNSGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDAVYY CARSGYSSSWFPDFDWFQGTLTVTSS
522	PRT	SYEMN
523	PRT	GISWNNSGWIDYADSVKG
524	PRT	SGYSSSWFPDFDFD
525	PRT	QSVLTQPPSVSAGPQRVTISCTGSSSDIGAGYDVHWYQQLPGTAPKLLI YGNNSRPSGVPDFSGSKSGTSASLAITGLQAEDAEADYYCSSYEGINPYV VFGGGTTKLT
526	PRT	TGSSSDIGAGYDVH
527	PRT	GNSNRPS
528	PRT	SSYEGINPYVV
529	DNA	GAAGTTCAAGCTGCTGGAAATCTGGCGGCCGACTGGTCAACCTGGCG ATCTGAGACTGAGCTGTGCCAGCGCTTCGACTTCGATAGCT ACGAGATGAACTGGGTCGGACAGGCCCTGGCAAAGGCCCTGAATG GGTGTCCGGCATCAGCTGGAAATAGCGCTGAGAGCCGAGGACACGCCGTG GCGTGAAGGGCAGATTACCATCAGCCGGACAACAGCAAGAAC CCTGAACTCTGCAGATGACAGCCTGAGAGCCGAGGACACGCCGTG ACTACTGTGCCAGAAGCCGTACAGCAGCTTGGTTGACCCGAC TTCGACTATTGGGGCAGGGCACACTGGTCACAGTCTTCA
530	DNA	AGCTACGAGATGAAC
531	DNA	GGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCGACAGCGTGA AGGGC
532	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT
533	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGGCCCTGGACAG AGAGTCGACCATCAGCTGACAGGCAAGCAGCTCCGATATTGGCGCCGG ATACGACGTGCACTGGTATCGCAACTGGCTGGCACAGGCCCTAAC TGCTGATCTACGGCAACAGAACAGACTAGCGCGTGGCCGATAGA TTCAGCGCTCTAAGTCGGCACAGGCCAGCCTGGCATTACTGG ACTGCAGGCCAGATGAGGCCGACTACTACTGAGCAGTACAG GGCATCAACCCCTACGTGGTTGGCCGGAAACAAGCTGACCGT TCTA
534	DNA	ACAGGCAGCAGCTCCGATATTGGCGCCGGATACGACGTGAC
535	DNA	GGCAACAGCAACAGACCTAGC
536	DNA	AGCAGCTACGAGGGCATCAACCCCTACGTGGT
537	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFDFDSYEMNWVRQAPGKLEW VSGISWNSGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDAVYY CARSGYSSSWFPDFDWFQGTLTVTSSASTKGPSVFLAPSSKSTSGG TAALGCLVKDYLFPPEPVTSWNSGALTSGVHTFPAVLQSSGGLYSLSVVT VPSSSLQTLYICNVNWKPSNTKVDKVEPKSCDKTHTCPCCPAELLGG PSVFLPPPKPKDTLMISRTEVTCVVVDVSHEDPEVKFNWYVDGEVHN AKTKPREEQYNSTYRVVSVLVLHDWLNGKEYKCKVSNKALPAPIEK TISKAKGQPREEPVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTTPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMEAL HNHYTQKSLSLSPKG
538	PRT	QSVLTQPPSVSAGPQRVTISCTGSSSDIGAGYDVHWYQQLPGTAPKLLI YGNNSRPSGVPDFSGSKSGTSASLAITGLQAEDAEADYYCSSYEGINPYV VFGGGTTKLT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No.	SEQ Type	SEQUENCE
		VAWKADSSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSRSYSC QVTHEGSTVEKTVAPTECS
539	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTTCAACCTGGCGG ATCTCTGAGACTTGAGCTGTGCCGCAGCGGCTTCGACTTCGATAGCT ACGAGATGAACGGGTCGACAGGCCCCCTGGCAAAAGGCGCTTGAATG GGTGTCCGGCATCAGCTGGAAATAGCGGCTGGATCAGACTACGCCGACA GCGTGAAGGGCAGATTACACCATCAGCGGGACAACAGCAAGAACAC CCTGTACCTGCAGATGAACAGCCTGAGAGCCGAGGACACGGCGTGT ACTACTGTGCCAGAAGCGGCTACAGCAGCTTGGTTGACCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTCTTCAGCCAG CACCAAGGGCCCGCAGCGTGTTCCTGGGCCCCTAGCAGCAAGAGCA CATCTGGCGAACAGCCCGCTGGCTGCTGTAAGGACTACTTT CCCGAGCCCGTGAACGGTGTCTGGAAACTCTGGCGCTTGACAAGCGG CGTGCACACCTTCCAGCCGTGCTGAGCAGCAGCCGCTGTACTCTCT GAGCAGCGCTGACAGCTGCCCAGCAGCTCTGGGACCCAGACCT ACATCTGCAACGTCAGACCAAGGCCAGAACACCAAGGTGGACAA GAAGGTGGAACCCAAGAGCTGCGACAAGACCCACACCTGTCCCCCTT GTCCCTGCCCCCAACTGCTGGGAGGCCCTCCGTGTTCCGTGTTCCCC CAAAGCCAAGGACACCCCTGATGATCAGCGGAGCCCCCGAAGTGAC CTGCGTGTGTGGATGTGTCAGGAGCCCTGAAGTGAAAGTTCA ATTGGTACGTGGACGGTGGAAAGTGCAACACGCCAACAGCC TAGAGAGGAACAGTAACACGCCACTACCGGGTGGTGTCCGTGCTGA CAGTGTGCAACAGGACTGGCTGAACGGCAAAGAGTACAAGTGCAA GGTGTCCAACAAAGGCCCTGCTGCCCATCGAGAAAACCATCAGCA AGGCCAACGGCCAGCCCCCGAACCCAGGTGTACACACTGCC AGCAAGGGACAGCTGACCAAGAACCCAGGTGTCCCTGACCTGTCTGT GAAGGCTCTACCCCTCCGATATCGCCGTGGAATGGGAGGCAACG GCCAGCCGAGAACACTACAAGGCCACCCCCCTGTGCTGGACAGC GACGGCTCATCTCTGTACAGCAAGCTGACCGTGGACAAGTCCCG GTGGCAGCAGGGCAACGTTGTCAGCTGCAAGCGTGTGACGAGGCC TGCACAAACCAACTACACCCAGAAGTCCCTGAGCCTGAGGCC TGCAAG
540	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGCGCCCTGGACAG AGAGTGACCATCAGCTGACAGGCCAGCAGCTCCGATATTGGCGCCGG ATACGAGCTGCACTGTTGACAGCAACTGCGCTGGCACAGCCCTAAAGC TGCTGATCTACGGCAACAGAACAGACTAGCGGGCTGGCCGATAGA TTCAAGCGGCTTAAGTCTGGCACAGCGCAGCTGGCCATTACTGG ACTGCAGGCCAGAGTGAAGGCCGACTACTACTGCGAGCAGTACAG GGCAGCAACCCCTACGGTGTGTTGGCGGGGAACAAAGCTGACCGT TCTAGGCCAGCCTAAAGGCCGCCCTAGCGTGACCCCTGTTCCCTCAA GCAGCGAGGAACAGCAGGCCAACAGGCCACCCCTGCGTGCCTGATC AGCGACTCTATCCTGGCGCGTGACCGTGGCCTGGAAAGGCCGATAG CTCTGGTGAAGGGCGCGTGGAACCAACCCACCCCTAGCAAGCAGA GCAACAAACAAATACGCCGCCAGCAGTACCTGAGCCTGACCCCCGAG CAGTGGAAAGTCCACAGATCTACAGCTGCAAGTGACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
541	PRT	EVQLLESGGGLVQPQGSRLSLCAASGFDFSSYEMNWVRQAPKGLEWV SGISWNNGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFPDFDFDYWGQGTLVTVSS
542	PRT	SYEMN
543	PRT	GISWNNGWIDYADSVKG
544	PRT	SGYSSSWFPDFDFY
545	PRT	QSVLTQPPSVSGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGASNRSRGVPDRFSGSKSGTSASLAITGLQAEDDEADYYCSSYEGPNPYV VFGGGTKLTVL
546	PRT	TGSSSNIGAGYDVH
547	PRT	GASNRP\$
548	PRT	SSYEGPNPYVV
549	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCGCAGCGGCTTCGATTCAGCAGCT ACGAGATGAACGGTCCGACAGGCCCTGGCAAAAGGCCCTGAATG

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID NO.	SEQ Type	SEQUENCE
		GGTGTCCGGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCACA GCGTGAAGGGCAGATTCAACCATCAGCCGGAACAGCAAGAAC CCTGTACCTGCAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCGAGAAGCCGCTACAGCAGCTTTGGTTTGACCCGAC TTCGACTATTGGGGCAGGGCACACTGGTCACAGTCTCTTCA
550	DNA	AGCTACGAGATGAAC
551	DNA	GGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCACAGCGTGA AGGGC
552	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT
553	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGCCCCCTGGACAG AGAGTGGACCATCAGCTGACAGGCGAGCAGCTCCAAATATCGGAGCCG CTATGACGTGCACTGGTATCAGCAGCTGGCACAGGCCCTAAAC TGCTGATCTACGGGCCAGAACAGACTAGCGGCTGCCGATAGA TTCAGCGCTCTAAGTCGGCACAGGCCAGCCTGGCCATTACTGG ACTGCAGGCCAGATGAGGCCGACTACTACTGAGCAGCTACGAG GCCCTAACCTTACGTGGTTGGCCGGAACAAAGCTGACCGT TCTA
554	DNA	ACAGGCAGCAGCTCAAATATCGGAGCCGCTATGACGTGCAC
555	DNA	GGCGCCAGCAATAGACCTAGC
556	DNA	AGCAGCTACGAGGGCCCCAATCCTTACGTGGTG
557	PRT	EVQLESGGGLVQPQGSRLSCAASGFDFSSYEMNWRQAPGKLEWV SGISWNNGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYVC ARSGYSSSWFDPDFDYWGQGLTVTSSASTKGPSVFLAPSSKSTSGGT AALGLCLVKDYPPEPVTSWNSGALTSGVHTFPALVLSGLYSLSVVT PSSSLGTQTYICNVNHKPSNTKVDKVEPKSCDKTHTCPCPAPELLGGP SVFLFPKPDKTLMSRTPETCVVVDVSHEDPEVKFNWVVDGEVHNA KTKPREEQYNSTYRVVSLTVLHQDWLNGKEYKCKVSNKALPAPIEKTI SKAKGQEPRQVYTLPPSRDELTKNQVSLSLCLVKGFYPSDIAVEWESNG OPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPKG
558	PRT	QSVLTQPPSVSGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAKPLLI YGASNRPSGVPDFRSGSKSGTSASLAITGLQAEDADYYCSSEGPNPYVT VFGGGTKLTVLGQPKAAPSVTLPFPPSSEELQANKATLVCLISDFYPGAVT VAWKADSSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
559	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGGCTTCGATTTCAGCAGCT ACGAGATGAACTGGGTCGACAGGCCCTGGCAAAGGCCCTGAAATG GGTGTCCGGCATCAGCTGGAATAGCGGCTGGATCGACTACGCCGACA CGCTGAAGGGCAGATTCAACCATCAGCCGGAACAGCAAGAAC CCTGTACCTGCAGATGAACAGCCTGAGAGCCGAGGACACGCCGTGT ACTACTGTGCGAGAAGCCGCTACAGCAGCTTTGGTTGACCCCGAC TTCGACTATTGGGGCAGGGCACACTGGTCAAGCTCTCAGCCAG CACCAAGGGCCCAGCGTGTCCCCCTGGCCCCTAGCAGCAAGAGCA CATCTGGCGAACAGGCCCTGGCTCGTGAAGGACTACTTT CCCGAGCCCGTGACCGCTGTCTGGAACCTTGGCGCTCTGACAAGGGG CGTGCACACCTTCCAGCCGTGTCAGCAGCAGCGGCCCTGTACTCT GAGCAGGGCTGTGACAGTGCCAGCAGCTCTGGCACCCAGACCT ACATCTGCAACGTGAACCCAAGGCCAGCAACACCAAGGTGGACAA GAAGGTGGAACCCAAGAGCTGCGAACAGGCCACACCTGTCCCCCT GTCCTGCCCGAACACTGTCTGGAGGCCCTCCGTGTTCTGTCTCCCC CAAAGCCAAGGACACCCCTGATGATCAGCCGACCCCGAAGTGAAC CTGCGTGGTGGTGTGTCCCACGAGGACCCCTGAAGTGAAGTTCA ATTGGTACGTGGACGGCGTGGAAAGTGCACAAACGCCAAGGCCAGCC TAGAGAGGAACAGTACACAGCACCTACCGGGTGGTGCCTGCTGTA CAGTGTGCACTGACAGGACTGGCTGAACGGCAAAAGAGTACAAGTGCAA GGTGTCCAACAAGGCCCTGCTGCCCATCGAGAAAACCATCAGCA AGGCCAAGGGCCAGCCCGAACCCCAAGGTGTACACACTGCCCTCA AGCAGGGACGAGCTGACAAGAACAGGTGTCCCTGACCTGTCTCGT GAAAGGCTTCTACCCCTCCGATATCGCCGTGGAATGGGAGAGCAACG GCCAGCCGAGAACAACTACAAGACCACCCCCCTGTGCTGGACAGC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GACGGCTCATTCCTGTCAGCAAGCTGACCGTGGACAAGTCCCG GTGGCAGCAGGGCAACGTGTTAGCTGCAGCGTGTGACGAGGGCC TGCACAAACCACACACCAGAACAGTCCCTGAGCCCTGGCAAG
560	DNA	CAGTCTGTTCTGACACAGCCTCCATCTGTCTGGCGCCCTGGACAG AGAGTGACCATCAGCTGACAGGCAGCAGCTCCAATATCGGAGCCGG CTATGACGTGACTGGTATCAGCAGCTGCCCTGGCACAGGCCCTAAAC TGCTGATCTACGGCGCAGCAATAGACCTAGCGGCGTGGCCGATAGA TTCAGCGGCTTAAGTCTGGCACACAGCCAGCTGGCCTATTACCTGG ACTGCAGGCCAGAGATGAGGCCGACTACTACTGCGAGCAGTACGAG GGCCCCAATCCTTACGTGGTGTGGCGGGGAACAAAGCTGACCGT TCTAGGGCAGCCTAAAGCCGGCCCTAGCGTGACCCCTGGTCCCTCAA GCAGCGAGGAACCTGAGGCCAACAGCCACCCCTGTGTGCGCTGATC AGCGACTTCTATCTGGCGCGTGACCGTGGCCTGGAGGCCGATAG CTCTCTGTGAAGGCCGGCGTGGAACACACCCCTAGCAAGCAGA GCAACAAATAACGCCGCCAGCAGCTACCTGAGCCTGACCCCGAG CAGTGGAAAGTCCCACAGATCTACAGCTGCCAACAGTGGCCCTACCGAG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
561	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFDSEYEMNWVRQAPGKLEWV SGISWNSGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYWGQGTLVTVSS
562	PRT	SYEMN
563	PRT	GISWNSGWIDYADSVKG
564	PRT	SGYSSSWFDPDFDY
565	PRT	QSVLTQPPSVGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSRPSGVPDFSGSKSGTSASLAITGLQAEDAEADYYCSSYAGPNPY VVFGGGTKLTVL
566	PRT	TGSSSNIGAGYDVH
567	PRT	GNSNRPS
568	PRT	SSYAGPNPYVV
569	DNA	GAAGTTCTAGCTGCTGGAAATCTGGCGCCGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCGCCAGCGCTTCACTTCTGATAGCT ACGAGATGAACGGGTCCGACAGGCCCTGGCAAAGGCCCTGAATG GGTGTCCGGCATCAGCTGGAAATAGCGGCTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTACCATCAGCCGGAACACAGCAAGAACAC CCTGTACCTGCAGATGAACAGCCTGAGAGCCGAGGACACCCCGTGT ACTACTGTGCCAGAAGCCGCTACAGCAGCTTGGTTGACCCCGAC TTCGACTATTGGGGCCAGGGCACACTGGTCACAGTCTCTTCA
570	DNA	AGCTACGAGATGAAC
571	DNA	GGCATCAGCTGAAATAGCGGCTGGATCGACTACGCCGACAGCGTGA AGGGC
572	DNA	AGCGGCTACAGCAGCTTGGTTGACCCGACTTCGACTAT
573	DNA	CAGTCGTTCTGACACAGCCTCCATCTGTCTGGCGCCCTGGACAG AGAGTGACCATCAGCTGACAGGCAGCAGCTCCAATATCGGAGCCGG CTATGACGTGACTGGTATCAGCAGCTGCCCTGGCACAGGCCCTAAAC TGCTGATCTACGGCAACAGCAACAGACCCAGCGGCGTGGCAGTAGA TTTCGGCTTAAGAGCGGCAACAGCGCAGCTGGCTTACTGTT ACTGCAGGCCAGGAAGGCCGACTACTGAGCTTACGCTG GCCCAATCCTTACGTGGTGTGGCGCGAACAAAGCTGACCGTT CTA
574	DNA	ACAGGCAGCAGCTCCAATATCGGAGCCGGCTATGACGTGAC
575	DNA	GGCAACAGCAACAGACCCAGC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
576	DNA	AGCTCTTACGCTGGCCCCAATCCTTACGTGGTG
577	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFDSYEMNWVRQAPGKGLEWV SGISWNSGWIDYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARSGYSSSWFDPDFDYGWQGTLTVTSSASTKGPSVPLAPSSKSTSGGT AALGCLVKDVFPEPVTSWNSGALTSGVHTFPAAVLQSGSGLYSLSSVVTV PSSSLGTQTYIICNVNHNKPSTNTKVDKVVEPKSCDKTHTCPCCPAPELLGGP SVFLFPKPKDITLMISRTPEVTCVVVDVSHEDEPKVNFWVVDGVEVHNA KTKPREEQYINSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT SKAKGQPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESEN OPENNYKTTTPVVLDSGSFFLYSKLTVDKSRWQQGNVFSCVMHEALH NHYTQKSLSLSPKG
578	PRT	QSVLTQPPSVSGAPGQRVTISCTGSSSNIGAGYDVHWYQQLPGTAPKLLI YGNNSRNSRGVPDRFSGSKSGTSASLAITGLQAEDAEADYYCSSLVYAGPNPY VVFGGGTIKLTVLQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPGAV TVKAQDASSSPVKAQGETTTPSKQSNNNYAAASSYLSLTPEQWKSHRSYS CQVTHEGSTVEKTVAPTECS
579	DNA	GAAGTTCACTGCTGGAACTCTGGCGGGACTGGTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCCAACGGCTTCACCTTCGATACT ACGAGATGAACGGTCCGACAGGCCCCCTGCCAAAGGGCTTGAATG GGTGTCCGGCATCAGCTGGAAATAGCGCTGGATCGACTACGCCGACA GCGTGAAGGGCAGATTACCCATCAGCCGGGACAAACAGCAAGAACAC CCTGTAACCTGCAGATGAACAGCCTGAGAGCCGAGGACACGGCGTGT ACTACTGTGCCAGAAGGGCTACAGCAGCTTGGTTGACCCGAC TTCGACTATTGGGGCAGGGCACACTGGTACAGTCTCTCAGCCAG CACCAAGGGCCCGAGCTGTTCCCTCTGGCCCTAGCAGCAAGAGCA CATCTGGCGGAACAGCCGGCTGGCTGCCTCGTGAAGGACTACTTT CCCGACCCGTGACCGTGTCTGGAACTCTGGCTCTGACAAGGG CGTGACACCTTCCAGCCGTGCTGAGAGCAGCGCCTGTAACACTCT GAGCACCGTCTGACAGCTGCCCAGCAGCTCTGGGACCCAGACCT ACATCTGCAACAGTGAACACCAAGGCCAGCAACACCAAGGTGGACAA GAAGGTGGAACCCAAGGCTGCGACAAGGACCAACACCTGTCCCCCT GTCTGCCCGGAACCTGCTGGAGGCCCTCCGTGTTCCCTGTTCCCC CAAAGGCCAAGGACACCCCTGATGTCAGCCGGACCCCGAAGTGA CTCGCTGCTGCTGATGTCCTCAGCGGACCCCTGAAGTGAAGTCA ATTGGTACGTGGACGGCTGGAAAGTGCACACAGCCTACCGGGTGGTCCGTGCTGA TAGAGAGGAACAGTACAACAGCACCTACCGGGTGGTCCGTGCTGA CAGTGTGCACAGGACTGGTGAACGGAAAGGACTACAAGTGC GGTGTCAAACAAGGCCCTGCTGCCCTACGAGAAAACCATCAGCA AGGCCAAGGGCAGCCGGGAACCCCAAGGTTGACACACTGCC AGCAGGGACGAGCTGACCAAGAACAGGTGCTCCCTGACCTGTCTCGT GAAAGGCTTCTACCCCTCCGATATCCCGTGGAAATGGGAGAGCAACG GCCAGCCCGAGAACAAACTACAAGGACACCCCGCTGCTGGACAGC GACGGCTCATTTCTCTGTCAGCAAGCTGACCGTGGACAGTCCCG GTGGCAGGGCAACGTGTTCACTGCGCAGCGTGTGACGAGGCC TGCACAAACCAACTACACCCAGAAGTCCTGAGCCTGAGGCC AGGCAAGGAAAGACAGTGGCTGAGCGTGGACAGTGGCAAGG AGCAGCGAGGAACTGCAAGCCAAACAGGCCACCCCTGTTGCTGATCA GCGACTTCTATCTGGCCCGTGGCTGGCCCTGGAAAGGCCGATAGC TCTCTGTGAAGGCCCGTGGAAACCAACCCCTGAGCAAGCAGAG CAACAACAAATAAGCCGGCAGCAGCTACCTGAGCCTGACCCCGAGC AGTGGAAAGTCCCCACAGTCTACAGCTGCAAGTGAACCCACGAGGGC AGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
580	DNA	CAGTCTGTTCTGACACAGCTCCATCTGTGCTGGCGCCCTGGACAG AGAGTGACCATCAGCTGACAGGAGCAGCTCCAAATATCGGAGCCG CTATGAGCTGCACTGGTATCAGCAGCTGCTGGCACAGCCCTAAAC TGCTGATCTACGGCAACAGCAACAGGCCAGGGCTGGCGATAGA TTTCGGCTCTAAGAGCCGACAAGGCCAGGGCTGGCTATTACTGG ACTGCAGGCCAGGAGCAGGCCGACTACTACTGTAGCTTCTACGCTG GCCCAACTCTACGTGGTTGGGGCCGGAAACAAAGCTGACCGTT CTAGGCCAGCTTAAAGGCCGGCTAGCGTGACCCCTGTCCTCCAAAG CAGCAGGAAACTGCAAGCCAAACAGGCCACCCCTGTTGCTGATCA GCGACTTCTATCTGGCCCGTGGCTGGCCCTGGAAAGGCCGATAGC TCTCTGTGAAGGCCCGTGGAAACCAACCCCTGAGCAAGCAGAG CAACAACAAATAAGCCGGCAGCAGCTACCTGAGCCTGACCCCGAGC AGTGGAAAGTCCCCACAGTCTACAGCTGCAAGTGAACCCACGAGGGC AGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
581	PRT	HHHHHHKNNVPRLKLSYKEMLESNNVITFNGLANSYYHTFLDEERSR LYVGAKDHIFSFDLVNIKDFQKIVWPVSYTRDECKWAGDILKECANF IKVLKAYNQTHLYACGTGAFPHPICTYIEIGHHPEDNIFKLENSHFENGRC KSPYDPKLLTASLLIDGELYSGTAADFMGRDFAIPTLGHHHPIRTEQHD SRWLNDPKFISAHЛИSESDNPEDDKVYFFFRENAIDGEHSGKATHARIQOI CKNDFGGHRSLVNKWTFLKARLICSVPGPNGIDTHFDELQDVFLMNFK DPKNPVYGVPTTSSNIFKGSAVCMYMSMSDVRVFLGPYAHRDGPNYQ

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
582	PRT	<p>WV PY QGR VP YPR PG T CPS KTF GGF D STK DL P DD V IT F A R SH P A M Y N P V F</p> <p>P MNN RP I V I KTD V NY QFT QI V V D R V D A E D G Q Y D V M F I G T D V G T V L K V V</p> <p>S I P K E T W Y D L E E V L L E E M T V F R E P T A I S A M E L S T K Q Q Q L Y I G S T A G V A Q L</p> <p>P L H R C D I Y G K A C A E C C L A R D P Y C A W D G S A C S R Y F P T A K R A T R A Q D I R N</p> <p>G D P L T H C S D L H D N H H G H S P E R I I Y G V E N S T F L E C S P K S Q R A L V Y W Q F</p> <p>Q R R N E E R K E E I R V D D H I I R T D Q G L L R S L Q Q K D S G N Y L C H A V E H G F I Q T L</p> <p>L K V T L V E I D T E H L E E L L H K D D D G D S K T K E M S N S M T P S Q K W Y R D F M Q</p> <p>L I N H P N L N T M D E F C E Q W W K R D R K Q R R Q P G H T P G M S N K W K H L Q E N K K</p> <p>G R N R P T H E F E R A P R S V D I E G R M D P K S C D T H T C P C P A P E L L G G P S V F L F</p> <p>P P K P K D T L M I S R T P E V T C V V D V S H E D P E V K F N W Y V D G V E V H N A K T K P</p> <p>R E E Q Y N S T Y R V V S V L T V L H Q D W L N G K E Y K C K V S N K A L P A I E K T I S K A K</p> <p>G Q P R E P Q V Y T L P P S R D E L T K N Q V S L T C L V K G F Y P S D I A V E W E S N G Q P E N</p> <p>N Y K T T P P V L D S D G S F F L Y S K L T V D K S R W Q Q G N V F S C S V M H E A L H N H Y T</p> <p>Q K S L S L S P G K</p>
583	PRT	<p>N Y A N G K N N V P R L K L S Y K E M L E S N N V I T F N G L A N S S Y H T F L L D E E R S R L</p> <p>Y V G A K D H I F S F N L V N I K D F Q K I V V W P V S Y T R D E C K W A G K D I L K E C A N F I</p> <p>K V L K A Y N Q T H L Y A C G T G A F H P I C T Y I E I G H H P E D N I F K L E N S H F E N G R G K</p> <p>S P Y D P K L L T A S L L I D G E L Y S G T A A D F M G R D F A I F R T L G H H H P I R T E Q H D</p> <p>R W L N D P R F I S A H L I P E S D N P E D D K V Y F F F R E N A I D G E H S G K A T H A R I Q G I C</p> <p>C K N D F G G H R S L V N K W T T F L K A R L I C S V P G P N G I D T H F D E L Q D V F L M N F K D</p> <p>P K N P V V Y G V F T T S S N I F K G S A V C M Y S M S D V R R V F L G P Y A H R D G P N Y Q</p> <p>V P Y Q G R V P Y P R P G T C P S K T F G G F D S T K D L P D D V I T F A R S H P A M Y N P V F</p> <p>M N N R P I V I K T D V N Y Q F T Q I V V D R V D A E D G Q Y D V M F I G T D V G T V L K V V S I</p> <p>P K E T W Y D L E E V L L E E M T V F R E P T A I S A M E L S T K Q Q Q L Y I G S T A G V A Q L P</p> <p>L H R C D I Y G K A C A E C C L A R D P Y C A W D G S A C S R Y F P T A K A R T R A Q D I R N G</p> <p>D P L T H C S D G G I E G R M D H H H H H H H</p>
584	PRT	<p>N Y A N G K N N V P R L K L S Y K E M L E S N N V I T F N G L A N S S Y H T F L L D E E R S R L</p> <p>Y V G A K D H I F S F N L V N I K D F Q K I V V W P V S Y T R D E C K W A G K D I L K E C A N F I</p> <p>K V L K A Y N Q T H L Y A C G T G A F H P I C T Y I E V G H H P E D N I F K L Q D S H F E N G R G</p> <p>K S P Y D P K L L T A S L L I D G E L Y S G T A A D F M G R D F A I F R T L G H H H P I R T E Q H D</p> <p>S R W L N D P R F I S A H L I P E S D N P E D D K V Y F F F R E N A I D G E H S G K A T H A R I Q G I C</p> <p>C K N D F G G H R S L V N K W T T F L K A R L I C S V P G P N G I D T H F D E L Q D V F L M N S K</p> <p>D P K N P I V Y G V F T T S S N I F K G S A V C M Y S M S D V R R V F L G P Y A H R D G P N Y Q</p> <p>W V P Y Q G R V P Y P R P G T C P S K T F G G F D S T K D L P D D V I T F A R S H P A M Y N P V F</p> <p>P I N N R P I M I K T D V N Y Q F T Q I V V D R V D A E D G Q Y D V M F I G T D V G T V L K V V S</p> <p>V P K E T W H D L E E V L L E E M T V F R E P T T I S A M E L S T K Q Q Q L Y I G S T A G V A Q L P</p> <p>L H R C D I Y G K A C A E C C L A R D P Y C A W D G S S C S R Y F P T A K A R T R A Q D I R N G</p> <p>D P L T H C S D G G I E G R M D H H H H H H H</p>
585	PRT	<p>N Y A N G K N N V P R L K L S Y K E M L E S N S V I T F N G L A N S S Y H T F L L D E E R S R L</p> <p>Y V G A K D H I F S F N L V N I K D F Q K I V V W P V S Y T R D E C K W A G K D I Q K E C A N F I</p> <p>K V L K A Y N Q T H L Y A C G T G A F H P I C T Y I E I G H H P E D N I F K L K D S H F E N G R G K</p> <p>S P Y D P K L L T A S L L I D G E L Y S G T A A D F M G R D F A I F R T L G H H H P I R T E Q H D</p> <p>R W L N D P R F I S A H L I P E S D N P E D D K V Y F F F R E N A I D G E H T G K A T H A R I Q G I C</p> <p>C K N D F G G H R S L V N K W T T F L K A R L I C S V P G P N G I D T H F D E L Q D V F L M N S K D</p> <p>P K N P I V Y G V F T T S S N I F K G S A V C M Y S M S D V R R V F L G P Y A H R D G P N Y Q</p> <p>V P Y Q G R V P Y P R P G T C P S K T F G G F D S T K D L P D D V I T F A R S H P A M Y N P V F P I</p> <p>M N N R P I M I K T D V N Y Q F T Q I V V D R V D A E D G Q Y D V M F I G T D V G T V L K V V S I P</p> <p>K E T W H D L E E V L L E E M T V F R E P T T I S A M E L S T K Q Q Q L Y I G S T A G V A Q L P</p> <p>Q R C A A Y G R A C A E C C L A R D P Y C A W D G A C S R Y F P A A K A R T R A Q D I R N G</p> <p>D P L T H C S D G G I E G R M D H H H H H H H</p>
586	PRT	<p>N Y A N G K N N V P R L K L S Y K E M L E S N N V I T F N G L A N S S Y H T F L L D E E R S R L</p> <p>Y V G A K D H I F S F N L V N I K D F Q K I V V W P V S Y T R D E C K W A G K D I L K E C A N F I</p> <p>K V L K A Y N Q T H L Y A C G T G A F H P I C T Y I E I G H H P E D N I F K L E N S H F E N G R G K</p> <p>S P Y D P K L L T A S L L I D G E L Y S G T A A D F M G R D F A I F R T L G H H H P I R T E Q H D</p>

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
587	PRT	RWLNDPRFISAHILIPESDNPEDDKVFYFFFRENAIDGEHSGKATHARIQGIC KNDFGGHRSVLNKWTTFLKARLICSVPGPONGIDTHFDELQDVFLMNFKD PKNPIVGVFTTSSNIFKGSAVCMYMSDVRVFLGPYAHRGPNYQW VPYQGRVPYPRPGTCPSKTFGGFDSTKDLPPDVITFARSHPAMYNPVFPI NNRPIMIKTDVNQFTQIVVDRVDAEDGQYDVMFIGTDVGTVLKVVSIP KETWHDLEEVLLLEEMTVFREPTTISAMELSTKQQQLYIGSTAGIAQLPLH RCDIYGKACAECLARDPYCAWDGSSCSRYFPPTAKARTRAQDIRNGDPL THCSDGGIEGRMDHHHHHH
800	PRT	NYQNGKNNVPRLKLSYKEMLESNNVITFNGLANSYYHTFLLDEERSRL YVGAKDHIFSPNLVNIKDFQKIVWWPVSYTRRDECKWAGKDILKECANFI KVLKAYNQTHLYACGTFGAFHPICTYIEGHHPEDNFVFKLEDSHFENGRRK SPYDPKLTLTASLLIDGELYSGTAADFMGRDFAIFRTLGHHHPIRTEQHDS RWLNDPRFISAHILIPESDNPEDDKVFYFFFRENAIDGEHGTGKATHARIQGIC KNDFGGHRSVLNKWTTFLKARLICSVPGPONGIDTHFDELQDVFLMNSKD PKNPVYVYGVFTTSSNIFKGSAVCMYMSDVRVFLGPYAHRGPNYQW VPYQGRVPYPRPGTCPSKTFGGFDSTKDLPPDVITFARSHPAMYNPVFPI NNRPIMIKTDVNQFTQIVVDRVDAEDGQYDVMFIGTDVGTVLKVVSIP KETWHDLEEVLLLEEMTVFREPTTISAMELSTKQQQLYVGSAAGVAQLPL HRCDIYGKACAECLARDPYCAWDGSSCSRYFPPTAKARTRAQDIRNGDPL PLTHCSDGGIEGRMDHHHHHH
801	PRT	SYYMS
802	PRT	TIIKSGGYAYYPDSVKD
803	PRT	GGQGAMDY
804	PRT	EIVLTQSPATLSLSPGERATLSCRASQSIGDYLHWYQQKPGQAPRLLIKY ASQSISGIPARFSGSGSGTDFTLTITSLEPEDFAVYYCQGYSFPYTFGG TKLEIK
805	PRT	RASQSIGDYLH
806	PRT	YASQSI
807	PRT	QQGYSFPYT
808	DNA	GAAGTGCAGCTGGTGGAAATCTGGCGGAGGACTGGTTCAACCTGGCGG CTCTCTGAGACTGTCCTTGTGCCAGCGCCCTAACCTTCAGCAGCTA CTCATGAGCTGGGTCCGACAGGCCCTGGCAAAGGACTTGAATGGG TGTCCACCATCATCAAGAGCGCGGCTACGCCCTACTATCCCGACAGC GTGAAGGACCGGTTCACCATCTCCAGAGACAACAGCAAGAACACCC GTACCTGAGATGAGCAGCCTGAGAGCCGAGGATAACCGCCGTGTACT ACTGTGTTAGAGGCCGACAGGGCGCCATGGATTATTGGGCCAGGG AACCACAGTGACCGTGTCA
809	DNA	GAGATTGCTGACACAGTCTCCGCCACACTGTCTTCTAGCCCTGGC GAAAGAGCCACACTGAGCTGTAGGCCAGCCAGAGCATCGGCATT ACCTGCACACTGGTATCAGCAGAAGCCCTGGACAGGCCCTCGGCTGCTG ATTAAGTACGCCAGCAGTCCATCAGCCGATCCTGCCAGATTTCT GGCAGCGGCTCTGGCACCGATTCCACCTGACCACCAAGCCCTGGA ACCTGAGGACTTCGCCGTGTACTACTGCCAGCAGGGCTACAGCTTCC CCTACACATTGGCGGAGGCACCAAGCTGGAAATCAA
810	PRT	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYYMSWVRQAPGKGLEW STIIKSGGYAYYPDSVKDRTISRDNSKNTLYLQMSSLRAEDTAVYYCVR GGQGAMDYWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPEPVTVWSNSGALTSGVHTFPAVLQSSGLYSLSSVTVPSSSLGTO TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPCCPAPELLGGPSVFLFPPK PKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNALKTPREE QYNSTYRVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQ PREPVYVTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGOPENNY KTPPPVLDSDGSFFLYSKLTVVDKSRWQGNVFSCSVMHEALHNHYTQK SLSLSPGK

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
811	PRT	EIVLTQSPATLSLSPGERATLSCRASQSIGDYLHWYQQKPGQAPRLLIKY ASQSISGIPARFSGSGSGTDFTLTITSLEPEDFAVYYCQQGYSFPYTFGGG TKLEIKRTVAAPSVPFIPPSDEQLKS GTASVVC LNNFYPREAKVQWKVD NALQSGNSQESVTEQDSK DSTS LSSTL TL SKAD YEKH KVYACEVTHQG LSSPVTKSFNRGEC
812	DNA	GAAGTGCAGCTGGTGGAACTGGCGGAGGACTGGTCAACCTGGCGG CTCTCTGAGACTGTCTTGCGCCAGCGCTTCACTTCAGCAGCTA CTACATGAGCTGGTCCGACAGGCCCTGGCAAAGGACTTGAATGGG TGTCCACCATCATCAAGAGCGCGCGTACGCC TACTATCCCGACAGC GTGAAGGACCGGTTCACCATCTCCAGAGACAACAGCAAGAACACCC GTACACTGAGCTGGCAGAGCAGCCGAGGATACCGCCGCTGTACT ACTGTGTAGAGGGCGGACAGGGCGCCATGGATTATTGGGGCCAGGG AACACAGTGA CGGTGT CATCGCCAG CACCAAGGGCCCAGCGTGT TCCCTCTGGCCCTAGCAGCAAGGACATCTGGCGGAACAGCCG CTGGCTTGGCTCTCGTAAGGACTACTTCCCGAGCCCGTGACCGTGT CTTGGAACTCTGGCGCTCTGACAAGCGCGTGCACACCTTTCCAGCG TGCTGAGAGCAGCGCCGTACTCTCTGAGCAGCGTGTGACAGTG CCCAGCAGCTCTGGCACCCAGACCTACATCTGCAACAGTGAACCA CAAGCCCCAGCAACACCAAGGTGGACAAGGAAGGTGGAAACCCAAGAGC TGC GACAAGACCCACACTGTCCCCCTGTCTGTGCCCCGA ACTGCTG GGAGGCCCTTCGTGTTCTGTTCCCCAAAGCCCAAGGACACCC GATGATCAGCCGACCCCGAAGTGACCTGCGTGTTGGATGTGT CCCACGAGGACCCCTGAAGTGAAAGTTCAATTGGTACGTGGACGGCG GAAGTGCAACAGCAGCAAGGACAGCTAGAGGGACAGTACAACA GCACCTACGGGTGGTGTCCGTGCTGACAGTGTGTCACCAGGACTGG CTGAACGCCAAGAGTACAAGTGC AAGGTGTCCAACAAGGCCCTGC CTGCCCTCATCGAGAAAACCATCAGCAAGGCCAAGGGCCAGGCC CGAACCCCAAGGTGTACACACTGCCCAAGCAGGGACGAGCTGACC AAGAACCCAGGTGTCCCTGACCTGTCTCGTAAAGGCTTCTACCC CGATATGCCGTGGAATGGGAGAGAACCGCAGCCAGAGAACAC TACAAGGACCAAGGCCCTGTGCTGACAGCGCTCATTCTTCT GTACAGCAAGCTGACCGTGGACAAGTCCGGTGGACAGGGCAAC GTGTTCAAGCTGAGCGTGTGATGCA CAGGGCCCTGCAACACCA CCAGAACGCTTGAGCTGAGCCCTGGCAAG
813	DNA	GAGATTGCTGACACAGTCTCCGCCACACTGTCTTAGCCCTGGC GAAAGAGCCACACTGAGCTGTAGAGCCAGCCAGAGCATCGCGATT ACCTGCAC TGGTATCAGCAGAAGCCCTGGACAGGCCCTCGCTGCTG ATTAAGTACGCCAGCAGTCCATCAGCGGATCCTGCGAGATTTC GGCAGCGGCTCTGGCACCCGATTTCACCTGACCATCACCAGCCTGG ACCTGAGGACTTCGCGGTGTACTACTGCCAGCAGGCTACAGCTTC CCTACACATTGGCGGGGCCACCAAGCTGGAAATCAAAGAACCGTG GCCGCTCCAGCGTGTTCATCTCCCACTAGCGACGAGCAGCTGAA GTCGGCAGCAGCCTCTCGTGTGCTGCTGTAACAAACTTCTACCC CGAGGCCAGGTGCACTGGAGGTGGACAATGCCCTGCAAGGCC AACAGCCAGGAAGCGTGA CGCAGGAGCAGCAGAACGACTCCAC ACAGCCAGGAGCAGCAGCAGGAGCAGCAGAACGAGTGT GCACAGGAGTGTACGCCCTGCGAAGTGACCCACAGGGCTGTCTAGCC CCGTGACCAAGAGCTTCAACAGGGCGAGTGT
814	PRT	EVQLVESGGGLVQPGGSLRLSCAASGFPFSSYYMSWVRQAPGKGLEW STIIKS GGYYAYYPDSVKDRFTISRDNSKNTLYLQMSSLRAEDTAVYYCVR GGQGAMDYWGQGTVTVSS
815	PRT	SYYMS
816	PRT	TIIKS GGYYAYYPDSVKD
817	PRT	GGQGAMDY
818	PRT	EIVLTQSPATLSLSPGERATLSCRASQSIGDYLHWYQQKPGQAPRLLIKY ASQSISGIPARFSGSGSGTDFTLTITSLEPEDFAVYYCQQGYSFPYTFGGG TKLEIK
819	PRT	RASQSIGDYLH
820	PRT	YASQSI S
821	PRT	QQGYSFPY

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
822	DNA	GAAGTCAGCTGGTGGAAATCTGGCGGAGGACTGGTCAACCTGGCG CTCTCTGAGACTGTCTTGTCGCCCTCTGGCTTCCATTCTAGCAGCTA CTACATGAGCTGGGTGGACAGGCCCTGGCAAAGGACTTGAAATGGG TGTACCTGCAGATGAGCAGCCTGAGAGCCGAGGATAACCGCGTGTAC TACTGTGTTAGAGGCGGACAGGGCGCATGGATTATTGGGCCAGGG AACACAGTGAACGTGTCACTCA
823	DNA	GAGATTGTGCTGACACAGTCCTCCGCCACACTGTCCTTAGCCCTGGC GAAAGAGGCCACTGAGCTGTAGAGCCAGGAGCATCGGCATT ACCTGCACTGGTATCAGCAGAACGGCTGGACAGGCCCTCGGCTGCTG ATTAAGTACGCCAGGTCCATCACGGCATCCTGCCAGATTTC GGCAGCGCTCTGGCACCGATTCCACCTGACCACCCAGCTGGGA ACCTGAGGACTTCGCCGTGACTACTGCCAGCAGGGCTACAGCTTCC CCTACACATTGGCGGAGGCAACAGCTGGAAATCAAA
824	PRT	EVQLVESGGGLVQPQPGSRLSCAASGFPFSSYYMSVRQAPGKGLEWV STIIKSYYAYYPDSDVKDRFTISRDNSKNLYLQMSSLRAEDTAVYYCVR GGQGAMDYWGQGTTTVVSSASTKGPSPVFLAPSSKSTSGGTAALGCLV KDYFPEPVTVSWNSGALTSGVHTFPVLQSSGLYSLSSVTPSSSLGTQ TYICNVNHPSNTKVDKVKVEPKSCDKTHTCPPCPAPEELLGGPSVLFPPK PKDTLMISRTPETVCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPRE QYNSTYRVSVSLTVLHQDWLNKEYKCVSNKALPAPIEKTISKAKQ PREPVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESENQPNENY KTPPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMEHALHNHTQK SLSLSPGK
825	PRT	EIVLTQSPATLSLSPGERATLSRASQSIGDYLHWYQQKPGQAPRLLIK ASQSIIGIPARFSGSGGTDFTLTTSLEPEDFAVYYCQGYSFYTFGG TKLEIKRTVAAPSFIGPPSDEQLKSGTASVVCLNNFYPREAKVQWKVD NALQSGNSQESVTEQDSKDSTYSLSTLTLKADYEKHKVYACEVTHQ LSSPVTKSFNRGEC
826	DNA	GAAGTCAGCTGGTGGAAATCTGGCGGAGGACTGGTCAACCTGGCG CTCTCTGAGACTGTCTTGTCGCCCTCTGGCTTCCATTCTAGCAGCTA CTACATGAGCTGGTGGACAGGCCCTGGCAAAGGACTTGAAATGGG TGTACCTGCAGATGAGCAGCTGAGAGCCGAGGATACCGCGTGTAC TACTGTGTTAGAGGCGGACAGGGCGCATGGATTATTGGGCCAGGG AACACAGTGAACGTGTCACTAGCCAGCACCAAGGGCCCCAGCGTGT TCCCTCTGGCCCTAGCAGCAAGAGCACATCTGGCGAACAGCGGCC CTGGCTGCGCTCGTGAAGGACTACTTCCCGAGGCCGTGACCGTGT CTGGAACTCTGGCGCTCGTACAAGCGCGTGCACACCTTCCAGCG TGCTGAGAGCAGCGCCCTGTACTCTCTGAGCAGCGTGTGACAGTG CCCAGCAGCTCTGGCACCCAGACCTACATCTGCAACGTGAACCA CAAGCCAGAACACCAAGGTGACAAGGAAGGTGGAACCCAAGAGC TGCGACAAGACCCACACTGTCCCCCTGTCTCGTCCCCGAACTGCT GGAGGCCCTCGTGTCCCTGTCCCCAAAGGACACCC GATGATCAGCGGACCCCCCGAAGTGACCTGCGTGGTGGATGT CCCACGGGACCCCTGAAGTGAAAGTCAATTGGTACGTGGACGGCGT GAAGTGACAACAGCCAAGACAAGGCTAGAGGAAACAGTACAACA GCACCTACCGGGTGGTGTCCGTGCTGACAGTGCTGACCCAGGACTGG CTGAACGGCAAAGAGTACAAGTGCAAGGTGTCACAAAGGCCCTGC CTGCCCCCATCGAGAAAACCATCAGCAAGGCAAGGGCCAGCCCC CGAACCCAGGTGACACACTGCCCCAACGAGGGACGAGCTGACC AAGAACCGAGGTGCTCTGACCTGTCCTGAAAGGCTTCTACCCCTC CGATATCGCCGTGGAATGGGAGAGCAACGGCAGGCCAGAAACAC TACAAGGACCAACCCCTGTGCTGGACAGGGACGGCTCATTCTCCT GTAGAGCTGACCGTGGACAAGTCCGGTGGCAGGGCAAC GTGTTCAAGCTGAGCTGATGCAACAGGGCCCTGCACAAACACTACAC CCAGAAGTCCCTGAGCCTGAGCCCTGGCAAG
827	DNA	GAGATTGTGCTGACACAGTCCTCCGCCACACTGTCCTTAGCCCTGGC GAAAGAGGCCACACTGAGCTGTAGAGCCAGGCAAGGAGCATCGGCATT ACCTGCACTGGTATCAGCAGAACGGCTGGACAGGCCCTCGGCTGCTG ATTAAGTACGCCAGGTCCATCACGGCATCCTGCCAGATTTC GGCAGCGCTCTGGCACCGATTTCACCCCTGACCACCCAGCGTGG ACCTGAGGACTTCGCCGTGACTACTGCCAGCAGGGCTACAGCTTCC CCTACACATTGGCGGAGGCAACAGCTGGAAATCAAACGAACCGT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		GCCGCTCCAGCGTGTTCATCTTCCCACCTAGCGACGAGCAGCTGAA GTCGGCACAGCTCTGTCGTGCCTGCTGAACAACCTTACCCCCG CGAGGCCAAGGTGCAAGTGGAGGTGGACAATGCCCTGCAGAGCGGC AACAGCCAGGAAAGCGTGACCGAGCAGGACAGCAAGGACTCCACCT ACAGCTGAGCAGCACCCCTGAGCAAGGCCACTACGAGAA GCACAAGGTGTACGCCTGCGAAGTGACCCACCAGGGCTGTCTAGCC CCGTGACCAAGAGCTCAACCGGGCGAGTGT
828	PRT	EVQLVESGGGLVQLGGSLRLSCAASGFTFSSYYMSWVRQAPGKGLEWV STIIKGSGYAYYPDSVKDRFTISRDNSKNTLYLQMNSLRAEDTAVYYCV KGGQGAMDYWGQGTTVTVSS
829	PRT	SYYMS
830	PRT	TIIKGSGYAYYPDSVKD
831	PRT	GGQGAMDY
832	PRT	EIVLTQSPATLSLSPGERATLSCRASQSIGDYLHWYQQKPGQAPRLLIYY ASQSISGIPARFSGSGSGTDFTLTISLEPEDFAVYYCQQGYSPPYTFGGGT KLEIK
833	PRT	RASQSIGDYLH
834	PRT	YASQSIS
835	PRT	QQGYSPPYT
836	DNA	GAAGTGCAGCTGGTGGAAATCTGGCGGAGGACTGGTTCAGCTCGCGG ATCTCTGAGACTGTCCTGGTGCAGCGGCTTACCTTCAGCAGCTA CTACATGAGCTGGTCCGACAGGCCCTGGCAAAGGACTTGAATGGG TGTCCACCATCATCAAGAGCGCGGCTACGCCCTACTATCCGACAGC GTGAAGGACCGGTTACCATCTCCAGAGACAACAGCAAGAACACCCCT GTACCTGCAGATGAACAGCTGAGACGGAGGACACCGCCGTGTACT ACTGTGTGAAAGGTGGACAGGGCGCCATGGACTATTGGGGCCAGGG AACACAGTGAACCGTGTCCCTCAGCCAGCACCAAGGGCCCCAGCGTGT
837	DNA	GAGATTGTGCTGACACAGTCTCCGCCACACTGTCCTTAGCCCTGGC GAAAGAGGCCACACTGAGCTGTAGAGCCAGCCAGAGCATCGCGATT ACCTGAGACTGCTATCAGCAGAGCTGGACAGGCCCTCGGCTGCTG ATCTACTATGCGCAGCCGTCATCAGCGGCACTCCCGCCAGATTTC GGCAGCGGCTCTGGCACCGATTTCACCTGACCCATAAGCAGCTGGA ACCTGAGGACTTCGCCGTGTACTACTGCCAGCAGGCTACAGCTTCC CCTACACATTGGCGGAGGACCAAGCTGGAAATCAA
838	PRT	EVQLVESGGGLVQLGGSLRLSCAASGFTFSSYYMSWVRQAPGKGLEWV STIIKGSGYAYYPDSVKDRFTISRDNSKNTLYLQMNSLRAEDTAVYYCV KGGQGAMDYWGQGTTVTVSSASTKGPSPVFPLAPSSKSTSCTGGTAALGCL VKDFPPEPVTVWSNNSGALTSGVHTFPAPVLQSSGLYSSLSSVTVPSSSLGT QTYICNVNHKPSNTKVDDKVEPKSCDKTHTCPCCPAPELGGGPSVLFPP KPKDTLMISRTPEVTCVVVDVSHEDEPKVFNWYVDGVFVHNAKTKPRE EQYNSTYRVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKG QPREQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESENQOPENN YKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCVMHEALHNHYTQ KSLSLSPGK
839	PRT	EIVLTQSPATLSLSPGERATLSCRASQSIGDYLHWYQQKPGQAPRLLIYY ASQSISGIPARFSGSGSGTDFTLTISLEPEDFAVYYCQQGYSPPYTFGGGT KLEIKRTVAAPSFIFFFFPSDEQLKSGTASVSVCLNNFYREAKVQWV NALQSGNSQESVTEQDSKDSTYSLSSTLTLKADYEHKHYACEVTHQG LSSPVTKSFNRGEC
840	DNA	GAAGTGCAGCTGGTGGAAATCTGGCGGAGGACTGGTTCAGCTCGCGG ATCTCTGAGACTGTCCTGGTGCAGCGGCTTACCTTCAGCAGCTA CTACATGAGCTGGTCCGACAGGCCCTGGCAAAGGACTTGAATGGG TGTCCACCATCATCAAGAGCGCGGCTACGCCCTACTATCCGACAGC GTGAAGGACCGGTTACCATCTCCAGAGACAACAGCAAGAACACCCCT GTACCTGCAGATGAACAGCTGAGACGGAGGACACCGCCGTGTACT ACTGTGTGAAAGGTGGACAGGGCGCCATGGACTATTGGGGCCAGGG AACACAGTGAACCGTGTCCCTCAGCCAGCACCAAGGGCCCCAGCGTGT TCCCTCTGGCCCTAGCAGCAAGAGCACATCTGGCGAACAGCCGCC

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
841	DNA	GAGATTGTGCTGACACAGTCTCCGCCACACTGTCTTAGCCCTGGC GAAAAGGCCACACTGAGCTGTAGAGCCAGCCAGACATCGGCATT ACCTGCACTGGTATCAGCAGAACGCTGGACAGGCCCTCGCTGCTG ATCTACTATGCCAGCCAGTCATCAGGGCATCCCCGCCAGATTTCT GGCAGCGGCTCTGGCACCGATTTCACCCCTGACCATAAGCAGCCTGGA ACCTGAGGACTTCGCCGTGTACTACTGCCAGCAGGGCTACAGCTTCC CCTACACATTGGCGGAGGCCAACAGCTGAAATCAAACGAACCGTG CGAACCCCCAGGTGTACACACTGCCCAACGCCAGGGACGAGCTGACC AAGAACCCAGGTGTCCCTGACCTGTCTGTGAAAGGCTCTACCCCTC CGATATGCCGTGGAATGGGAGAGAACGCCAGCCAGGAGAACAC TACAAGACCACCCCCCTGTGCTGGACAGCAGGGCTATTCTTCC GTACAGCAAGCTGACCGTGGACAAGTCCCCTGGCAGCAGGGCAAC GTGTTCAAGCTGAGCGTGTACGAGGCCCTGACAACCAACTACAC CCAGAAGTCCCTGAGCCCTGAGCCCTGGCAAG
842	PRT	EVQLVESGGGLQLGGSRLSCAASGFTFSSYYMSWVRQAPGKLEWV STIIKSYYAYYPDSVKDRFTISRDNSKNTLNQMNSLRAEDTAVYYCV KGQGAMDYWGQGTTTVSS
843	PRT	SYYMS
844	PRT	TIIKSYYAYYPDSVKD
845	PRT	GGQGAMDY
846	PRT	EIVLTQSPATLSLSPGERATLSCRASQSIGDYLHWYQQKPGQAPRLLIK ASQSIISGIPARFSGSGSGTDFTLTISLEPEDFAVYYCQQGYSFPYTFGGGT KLEIK
847	PRT	RASQSIGDYLH
848	PRT	YASQSIIS
849	PRT	QQGYSFPY
850	DNA	GAAGTGCACTGGTGGAAATCTGGCGGAGGACTGCTGCAGCTTGGCG ATCTCTGAGACTGTCTTGTCGCCAGCGCTTACCTTCAGCAGCTA CTACATGAGCTGGTCCGACAGGCCCTGGCAAAGGACTTGAATGGG TGTCCACCATCATCAAGAGCGGGCTACGCCCTACTATCCCGACAGC GTGAAGGACCGGTTCACCATCTCCAGAGACAACAGCAAGAACACCC GAACCTGCAAGATGAAACAGCCTGAGAGCCAGGACACCGCCGTGTAC TACTGTGTGAAAGGTGGACAGGGGCCATGGACTATTGGGCCAGG GAACAAACAGTGACCGTGTCTCA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
851	DNA	GAGATTGTGCTGACACAGTCTCCGCCACACTGTCCTTAGCCCTGGC GAAAGAGGCCACACTGAGCTGTAGAGCCAGCCAGAGCATCGCGATT ACCTGAGCTGGTATCAGCAGAAGGCCCTGGACAGGCCCTCGGCTGCTG ATTAAGTACGCCAGCCAGTCCATCAGGGCATCCCTGCCAGATTTCT GGCAGGGCTCTGGCACCGATTTCACCCCTGACCATAAAGCAGCCTGGA ACCTGAGGACTTCGCCGTGACTACTGCCAGCAGGCCCTACAGCTTCC CCTACACATTGGCGGAGGCACCAAGCTGGAAATCAA
852	PRT	EVQLVESGGGLLQLGGSLRLSCAASGFTFSSYYMSWVRQAPGKGLEWV STIIKSGGYAYYPDSVKDRFTISRDNSKNLNLQMSLRAEDTAVYYCV KGGQGAMDYWGQGTTTVSSASTKGPSPVFPLAPSSKSTSAGTAALGCL VKDYFPEPVTVWSNSGALTSGVHTFPAPVLQSSGLYSLSVVTVPSSSLGT QTYICNVNHNKPSNTKVDDKVEPKSCDKTHTCPGPCAPEELLGGPSVLFPP KPKDTLMISRTPEVTCVVVDVSHEDEPKVNPWYDGVVEHNAKTKPRE EQYNSTRYRVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKG QPREFQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENN YKTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCVMHEALHNHYTQ KSLSLSPGK
853	PRT	EIVLTQSPATLSLSPGERATLSCRASQSIGDYLHWYQQKPGQAPRLLIKY ASQSIISCIPIPARPGSGSGTDFTLTISLEPEDFAVYYCQGQYSFPYTFGGGT KLEIKRTVAAPSFLPPPSDEQLKSGTASVVCVLLNFYPREAKVQWKV NALQSGNSQESVTEQDSDKDSTYSLSSTLTLKADYEKHKVYACEVTHQG LSSPVTKSFNRGEC
854	DNA	GAAGTCAGCTGGTGGAAATCTGGCGGAGGACTGCTGCAGCTTGGCGG ATCTCTGAGACTGTCCTGTGCCGCCAGCGGCTTACCTTCAGCAGCTA CTACATGAGCTGGGCCAGCAGGCCCTGGCAAAGGACTTGAATGG TGTCCACCATCATCAAGAGCGCGGCTACGCCACTATCCCGACAGC GTGAAGGACCGGTTACCCATCTCCAGAGACAACAGCAAGAACACCC GAACCTGAGATGAACAGCTGAGAGCCGAGGACACCGCCGTGAC TACTGTGAAAGGTGACAGGGCCATGACTATTGGGCCAGG GAACAACTGACGGTCTGGCTCAGCAGCACCAAGGGCCCCAGCGTG TCCCCTCTGGCCCTAGCAGCAAGGACATCTGGCGGAACAGCGC CCTGGCTGCCCTGTGAAGGACTACTTCCGAGGCCGTGACCCT CCTGGAACTCTGGCCTCTGACAAAGGGCCGCTGACACCTTCCAGCC GTGCTGAGACACGGCCCTGTACTCTGACCGACCGCTGTGACAGT GCCACAGCTCTGGCACCCAGACTACATCTGAACTGAA ACAAGCCCAGCAACACCAAGGTGGACAAGAAGGTGGAACCCAAGAG CTGCGCAAGAACGCCCCACCCCTGTCCCTGCCCTGGAAACTGCT GGGAGGCCCTCCGTGTTCTGTTCCCCCAAAGCCAAGGACACCC TGATGATCAGCGGACCCCGAAGTGACCTGCGTGGTTGGATGTG TCCCACGAGGACCCGTGAAGTGAAGTCAATTGGTACGTGGACGGCGT GGAAGTGCACAAACGCCAGGACCAAGCTAGAGAGGAACAGTACAC AGCACCTACCGGGTGGTCCCTGCTGACAGTGCTGCACCCAGGGACTG GCTGAACGGAAAGACTACAGTGCAAGGTGTCAACAAAGGCCCTG CCTGCCCTCATGAGAAAACCATCAGCAAGGCCAGGGCCAGCCCC GCGAACCCAGGTACACACTGCCCTCAAGCAGGGACGAGCTGAC CAAGAACCCAGGTGACCTGCTGACCTGTCTCGTGAAGGCTTCTACCCCT CCGATACTGCCGTGAAATGGGAGAGCAACGCCAGCCGAGAACAA CTACAAGACCAACCCCCCTGTGCTGGACAGCGACGGCTCATCTCC GTACAGCAAGCTGACCGTGGACAAGTCCGGTGGCAGCAGGGCAC GTGTTCACTGCAAGCTGATGCAAGGCCCTGCAACACCAACTACAC CCAGAACGCTGAGCCCTGAGCCCTGCCAGGGCAAG
855	DNA	GAGATTGTGCTGACACAGTCTCCGCCACACTGTCCTTAGCCCTGGC GAAAGAGGCCACACTGAGCTGTAGAGCCAGCCAGAGCATCGCGATT ACCTGAGCTGGTATCAGCAGAAGGCCCTGGACAGGCCCTCGGCTGCTG ATTAAGTACGCCAGCCAGTCCATCAGGGCATCCCTGCCAGATTTCT GGCAGGGCTCTGGCACCGATTTCACCCCTGACCATAAAGCAGCCTGGA ACCTGAGGACTTCGCCGTGACTACTGCCAGCAGGCCCTACAGCTTCC CCTACACATTGGCGGAGGACCAAGCTGGAAATCAAACGAACCC GCCGCTCCAGCGTGTTCATCTCCACCTAGCAGCAGCAGCTGAA GTCCGGACAGCCTCTGTGCTGCTGCTGAAACAACCTTCTACCCCG CGAGGCCAGGTGCACTGGAGGTGACATGCCCTGCAAGCAGCG AACAGCCAGGAAGCGTGAACCGAGCAGGACAGCAAGGACTCCACCT ACAGCGTGAACGAGCACCCTGACCCCTGAGCAAGGCCACTACGAGAA GCACAAAGGTGACGCCCTGCCAGGTGACCCACCCAGGGCTGTCTAGCC CCGTGACCAAGAGCTTCAACCGGGCGAGTGT

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
856	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFRSYAVHWVRQAPGKGLEWV SSTEKGSGVGTSYTDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RMLGGGNPLDYLDYWGQGTLVTVSS
857	PRT	SYAVH
858	PRT	STEGSGVGTSYTDHSVKG
859	PRT	MLGGGNPLDYLDY
860	PRT	QSVLTOPPSASGTPGQRVTISCGSSSNLGEFYDVHWYQQLPGKAPKLLI YYSDFRPSGVSDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLSSQ VFGGGTQVTVL
861	PRT	SGSSSNLGEFYDVH
862	PRT	YSDFRPS
863	PRT	AAWDDDSLSSQV
864	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTTAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCGCCAGCGCTTACCTTTAGAACGCT ATGCCGTGCACTGGGTCGGACAGGCCCTGGAAAAGGACTGGAATG GGTGTCCAGCACCGAAGGCTCTGGCGTGGCACAAGCTACACCGATT CTGTGAAGGGCAGATTCAACCATCAGCGGGACAACAGCAAGAACAC CCTGTACCTGCAGATGAAACAGCCTGAGAGCCGAGGACACCGCCGTG ACTACTGTGCCAGAATGCTCGCGGGAGGAACCCCTGGACTACCTG GATTATTGGGCCAGGGCACCCCTGGTCACAGTCTTCAGCCAGCAC GCTA
865	DNA	CAGTCTGTTCTGACACAGCCTCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCCAATCTCGCGAGG GCTATGACGTGCACTGGTATCAGCAGCTGCTGGCAAGGCCCTAAA CTGCTGATCTACTACAGCGACTTCAGACCCAGCGCGTGTCCGATAG ATTCAAGGGCTCTAAGAGCGGCACATCTGCCAGCCTGGCATCTGTG GACTGCAGAGCGAAGATGAGGCCGACTACTATTGCGCCGCTGGGAT GATAGCTTGAGCAGCCAAGTTTGCGGGAGGAACCCAAGTGACCGT GCTA
866	PRT	EVQLLESGGGLVQPGGSLRLSCAASGFTFRSYAVHWVRQAPGKGLEWV SSTEKGSGVGTSYTDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RMLGGGNPLDYLDYWGQGTLVTVSSASTKGPSVFPLAPSKSTSGGTA LGCLVKDYYFPEPVTVWSWNSGALTSGVHTFPAVLQSSGLYSLSSVTPVSS SLGTQTYICVNHHPSNPKVDKKVEPKSCDKTHTCPCCPAPELLGGPSVF LFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVVKFNWYWDGVEVHNAAKT KPREEQYNSTYRVVSVLVLHQDWLNGKEYKCKVSNKALPAPIEKTISK AKGQPQEPVYTLPPSRDELTKNQVSLTELVKGFPYPSDIAVEWESNGQP ENNYKTTTPVLDSDGSFLYFSKLTVDKSRWQQGNVFSCSVHEALHNH YTQKSLSLSPKG
867	PRT	QSVLTOPPSASGTPGQRVTISCGSSSNLGEFYDVHWYQQLPGKAPKLLI YYSDFRPSGVSDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLSSQ VFGGGTQVTVLGQPKAAPSVTLPFPSSSEELQANKATLVCILISDFYPGAVT VAWKADSSPVKAGVETTPSKQSNNKYAASSYLSLTPEQWKSHRSYSC QVTHEGSTVEKTVAPTECS
868	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTTAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCGCCAGCGCTTACCTTTAGAACGCT ATGCCGTGCACTGGGTCGGACAGGCCCTGGAAAAGGACTGGAATG GGTGTCCAGCACCGAAGGCTCTGGCGTGGCACAAGCTACACCGATT CTGTGAAGGGCAGATTCAACCATCAGCGGGACAACAGCAAGAACAC CCTGTACCTGCAGATGAAACAGCCTGAGAGCCGAGGACACCGCCGTG ACTACTGTGCCAGAATGCTCGCGGGAGGAACCCCTGGACTACCTG GATTATTGGGCCAGGGCACCCCTGGTCACAGTCTTCAGCCAGCAC CAAGGGCCCAGCGTGTCCCTCTGGCCCTTAGCAGCAAGAGCACAT CTGGCGGAACAGCCGCCCTGGGCTGCCTCGTGAAGGACTACTTTCCC GAGCCCGTGACCGTGTCTGGAACTCTGGCGCTCTGACAACAGCGGGGT GCACACCTTCCAGCGCTGCTGAGAGCAGCGGGCTGTACTCTCTGA GCAGCGCTGTGACAGTGCAGCAGCTCTGGCACCCAGACCTAC ATCTGCAACGTGAACCAAGCCCAGCAACACCAAGGTGGACAAGA AGGTGGAACCCAAGAGCTGCGACAAGACCACACCTGTCCCCCTGT CCTGCCCGAACACTGCTGGAGGCCCTCCGTGTTCTGTTCCCCCCA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		AAGCCCAAGGACACCCCTGATGATCAGCCGGACCCCCGAAGTGACCTG CGTGGTGGTGGATGTGTCACGAGGACCTGAAGTGAAAGTCAATT GGTACCTGGACGGCTGGAAGTGACAAACGCCAAGACCAAGGCTAG AGAGGAACAGTACAACAGCACCTACGGGTGGTGTCCGTGCTGACA GTGCTGACCAAGGACTGGCTGAACGCCAAGAGTACAAGTCAAGG TGTCCAACAAGGCCCTGCTGCCCATCGAGAAAACCACAGCAAG GCCAACGGCCAGGCCGGAAACCCAGGTGTACACACTGCCCAAG CAGGGACAGCTGACCAAGAACAGGTGTCCCTGACCTGTCTGTGA AAGGTTCTACCCCTCGATATCGCGTGGAAATGGGAGGCAACCGC CAGCCCGAGAACAACTACAAGACCAACCCCCCTGTGCTGGACAGCGA CGGCTATTCTTCCCTGACAGCAAGCTGACCGTGGACAAGTCCCGT GGCAGCAGGGCAACGTTGAGCTGCAAGCTGATGCAACGAGGCCCTG CACAAGCAACTACACCCAGAAGTCCCTGAGCCTGAGCCCTGGCAAG
869	DNA	CAGTCCTTCTGACACAGCCTCTAGCGCTCTGGCACACCTGGACAA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCCAAATCTGGCGAGG GCTATGACGTGCACTGGTATCAGCACGTGCTGGCAAGGCCCCCTAA CTGCTGATCTACTACAGCGACTTCAGACCCAGCGCGTGTCCGATAG ATTCAAGGGCTCTAAGAGCGGCACATCTGCCAGCCTGGCCATCTGT GACTGAGAGCGAAGATGAGGCCGACTACTATTGCGCCGCGCTGGGAT GATAGCTGAGCGCAAGTTTGCGCCGGAACCCAAGTGACCGT GCTAGGCCAGCCTAAAGCCGCCCTAGCTGACCCCTGTTCTCTCAA GCAGCGAGGAACTGCAAGGCCAACAGGCCACCCCTGTGTGCGCTGATC AGCGACTTCTATCTGGCCCGTGAAGCTGGCCTGGAAAGGCCGATAG CTCTCTGTGAAGGGCGCGTGGAAACCAACCCCTAGCAAGCAGA GCAACAAACAAATACGCCGCCAGCAGCTACCTGAGCTGACCCAGGAG CAGTGGAAAGTCCCACAGATCCTACAGCTGCAAGTGACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
870	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFRSYAVHWVRQAPGKLEWV SSTEKGSGVGTSYTDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RMLGGGNPLDYLDYWGQGTLVTVSS
871	PRT	SYAVH
872	PRT	STEKGSGVGTSYTDSVKG
873	PRT	MLGGGNPLDYLDY
874	PRT	QSVLTQPPSASGTPQRVTI SCGSSSNLGEFYDHWYQQLPGKAPKLLI YYSDFRPSGVSDRFSGSKSGTSASLAISGLQSEDEADYYCAAWDDSLSSQ VFGGGTQVTVL
875	PRT	SGSSSNLGEFYDVH
876	PRT	YSDFRPS
877	PRT	AAWDDSLSSQV
878	DNA	GAAGTTCAGCTGCTGGAATCTGGCGCCGGACTGGTTCAACCTGGCG ATCTCTGAGACTGAGCTGTGCGCCAGCGGCTTACCTTTAGAAGCT ATGCCGTGCACTGGGTCGGACAGGCCCTGGAAAAGGACTGGAATG GGTGTCAAGCACCGAACGGCTCTGGCGTGGGACAAGCTACACCGATT CTGTGAAGGGCAGATTCAACCATCAGCGGGACAACAGCAAGAACAC CCTGTACCTGCGAGATGAAACAGCTGAGAGCCGAGGACACCGCGTGT ACTACTGTGCGAGAATGCTCGCGGAGGAACCCCTGGACTACCTG GATTATGGGCCAGGGCACCCCTGGTCACAGTCTTCA
879	DNA	CAGTCCTTCTGACACAGCCTCTAGCGCTCTGGCACACCTGGACAA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCCAAATCTGGCGAGG GCTATGACGTGCACTGGTATCAGCACGTGCTGGCAAGGCCCCCTAA CTGCTGATCTACTACAGCGACTTCAGACCCAGCGCGTGTCCGATAG ATTCAAGGGCTCTAAGAGCGGCACATCTGCCAGCCTGGCCATCTGT GACTGAGAGCGAAGATGAGGCCGACTACTATTGCGCCGCGCTGGGAT GATAGCTGAGCGCAAGTTTGCGCCGGAACCCAAGTGACCGT GCTA
880	PRT	EVOLLESGGGLVQPGGSLRLSCAASGFTFRSYAVHWVRQAPGKLEWV SSTEKGSGVGTSYTDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RMLGGGNPLDYLDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTA LGCLVKDYPFPEPVTVSWNSGALTSGVHTFPALQSSGLYSLSSVTPSS

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID No	SEQ Type	SEQUENCE
		SLGTQTYICNVNHPNSNTVKDKKVEPKSCAAGSEQKLISEEDLSGSAAA HHHHHH
881	PRT	QSVLTQPPSASGTPGQRVTISCGSSSNLGEFYDVHWYQQLPGKAPKLLI YYSDFRPSGVSDRFSGSKSGTSASLAISGLQSEDADYYCAAWDSSLSSQ VFGGGTQVTVLGQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPGAVT VAWKADSPPVKAQVETTPSKQSNNKYAAASSYLSLTPEQWKSRSYSC QVTHEGSTVEKTVAPTECS
882	DNA	GAAGTTCACTGCTGGAATCTGGCGCCGACTGGTCAACCTGGCGG ATCTCTGAGACTGAGCTGTGCCAGCGCCTTGAAAGGACTGGAAATG ATGCCGTGCACTGGGTCGACAGGCCAGGGCCCTGGAAAGGACTGGAAATG GGTGTCCAGAACCGAAAGGCTCTGGCTGGGCACAAGCTCACCGATT CTGTGAAGGGCAGATTACCATCAGCCGGACACAGCAAGAAC CCTGTACTCTGAGATGAACAGCCTGAGAGCCGAGGACACCGCGTGT ACTACTGTGCCAGAATGCTGGCGGAGGCAACCCCTGGACTACCTG GATTATTGGGGCCAGGGCACCTGTCAAGTCTCTCAGCCTCCAC CAAGGGCCATCGGTGTCCCCCTGGCACCCCTCTCCAAGAGCACCT CTGGGGGCAAGCGGCCCTGGGCTGGCTCAAGGACTACTTCCC GAAGGGTGAAGGTGTGGAAACTCAGGCGCCCTGACCAGCGCGT GCACACCTTCCGGCTGTCTACAGTCTCAGGACTCTACTCCCTCAG CAGCGTGGTACCGTGCCTCCAGCAGCTGGCACCCAGACCTACA TCTGCAACGTGAATCACAAGGCCAGAACACCAAGGTGGACAAGAA AGTTGAGGCCAAATCTTGTGCAAGCGGGTTCTGAACAAAACATCT CAGAAGAGGATCTGTGGATCAGCGCCGCCATCATCATCATCAT CAT
883	DNA	CAGTCTGTTCTGACACAGCCTCTAGCGCCTCTGGCACACCTGGACA GAGAGTGACCATCAGCTGTAGCGGCAGCAGCTCAATCTGGCGAGG GCTATGACGTGCACTGGTATCAGCAGCTGCTGGCAAGGCCCCCAA CTGCTGATCTACTACAGCGACTTCAGACCCAGCGCGTGTCCGATAG ATTCAAGGGCTCTAAAGGCCACATCTGCCAGGCTGGCCATCTCTG GACTCGAGCGAAGATGAGGCCGACTACTATTGCGCCGCTGGGAT GATACTGTAGCCAGCTAAAGCCGCCCTAGCGTGAACCTGTTCCCTCAA GCTAGGCCAGCTAAAGCCGCCCTAGCGTGAACCTGTTCCCTCAA GCAGCGGAACTGAGGCCACAAGGCCACCCCTGTGTGCGCTGATC AGCGACTCTATCCTGCCCGCTGACCGTGCCTGGAAAGGCCGATAG CTCTCTGTGAAGGCCGCCGTGGAACACCAACCCCTAGCAAGCAGA GCAACACAAATACGCCAGCAGCACCTGAGCTGACCTGACCCCCGAG CAGTGGAAAGTCCCACAGATCTACAGCTGCCAAGTGAACCCACGAGGG CAGCACCGTGGAAAAGACAGTGGCCCTACCGAGTGCAGC
884	PRT	NYQNQKNVNPRLKLSYKEMLESNNVITFNGLANSSSYHTFLDEERSRL YVGAKDIFFSNLVNIKDFQKIAWPVSYTRRDECKWAGKDILRECANFI KVLKVYNQTHLYACGTGAFHPICTYVGIGHHPEDNIFKLEDSHFENGRC KSPYDPKLLTASLLIDGELYSGTAADFMGRDFAIFRTLQHOPRTEQHD SRWLNDPFRFISAHLIPESDNPEDDKVVFFFRENAIDGEHSGKATHARIQOI CKNDFGGHRSLVNKWTTFLKARLICSVPGPNIGIDTHFDELQDVFLMSK DPKNPPIVYGVFTSSNIFRGSAVCMYSMSDVRVFLGPYAHDRGPNQY WVPFQGRVPYPRPGTCSKTFGGFESTKDLPPDVITFARSHPAVMNPVFP INNRPIMVKTDVNYQFTQIVVDRVDAEDGQYDVMFIGTDVGTVLKVSSI PKETWHDLEEVLLLEEMTVFREPTTISAMELSTKQQQLYVGSAAAGVAQLP LHRCDIYKGKACAECLLARDPYCAWDGSSCSRYFPTAKRRTRRQDIRNG DPLTHCSDDGIERMDHHHHHH
885	DNA	AACATATCAGAACGGCAAGAACACGTGCCCGGCTGAAGCTGAGCT ACAAAGAGATGCTGGAAAGCAACACGTGATCACCTCAACGGCCT GCCAACAGCAGCAGTACACACACCTTCTGCTGGACGAGGAACGGT CCAGACTGTACGTGGGAGCCAAGGACCATCTCAGCTCAACCTG GTCAACATCAAGGACTTCCAGAAAATCGCTGGCTGTGTCCTACAC CAGACGGGATGAGTGAAATGGCCGGCAAGGACATCTCGAGAGAG TGCGCCAACTTCATCAAGGTGCTGAAGGTACAAATCAGACCCACCT GTACGCCGTGGCACCGCGCTTTACCCCTATCTGACCTATGTCGG CATGCCACCATCTGAGGACAATATCTTCAGCTGAGCTGAGGACAGCC ACTTCGAGAACGGCAGAGGCAAGAGCCCTACGATCCCAAACATGCTG ACAGCCTCTGCTGATCGACGGCAGCTGTATTCTGGCACAGCCGC CGATTTCATGGCAGAGACTTCGCCATCTCAGAACCTGGGAGCAG ATCACCCCATCAGAACGGAGCAGCACAGCAGATGGCTGAACCGA CCCCAGATTCTGAGCAGGCCATCTGATCCCCGAGAGCGACAACCCCG AGGACGACAAGGTGACTTCTCTCCGGAAAACGCCATCGACGGG GAGCACTCTGGAAAAGGCCACACAGCAGAATCGGCCAGATCTGCA

TABLE 1A-continued

Corresponding amino acid sequences and nucleic acid sequences of antibodies according to the present disclosure mentioned in table 1 under the respective SEQ IDs. SEQ ID 581 to 587 being the corresponding Sema3A protein sequences from *Homo sapiens* (SEQ ID 581, 582), *Mus Musculus* (SEQ ID 583), *Rattus norvegicus* (SEQ ID 584), *Canis lupus familiaris* (SEQ ID 585), *Macaca fascicularis* (SEQ ID 586), *Sus scrofa* (SEQ ID 587).

SEQ ID NO	SEQ Type	SEQUENCE
		AGAACGACTTCGGCGGCCACAGATCCCTCGTGAACAAGTGGACCACC TTCCCTGAAGGCCCGGTGATCTGTTCTGTGCCCGGACCTAATGGCATC GATACCCACTTCCGAGCGTCCAGGACGTGTTCCCTGATGAAACAGCAA GGACCCCCAAGAATCCCATCGTGTACCGCGTGTTCACCCACAGCAGCA ACATCTTAGAGGCAGGGCGTGTGCATGTACAGCATGTCGATGTG CGGAGAGTGTTCCTGGGCCCCAACGCTCACAGAGATGGCCCCAATT TCAGTGGGTGCAATTCCAGGGCAGAGTGGCCATTCTAGACCTGGCA CCTGTCCTAGCAAGACCTTTGGCGGCTTCAGAGACCAAGGACCTG CTTGACGATGTTGATTAACCTTCGGCAGATCTCACCCGCCATGTAACAC CCTGTTCCCCATCAACACAGGCCATCATGGTCAAGACCGACGT GAACCTACAGGTCACCCAGATCGTGGTGGACAGAGTGGATCCGAGG ACGGCAGTACGACGTGATGTTCATGGCACCGATGTGGGACCGCTG CTGAAAGTGTGTCATACTCCAAAAGAGACATGGCACGACCTGGAAAG GGTGTGCTGGAAAGAGATGACCGTGTTCAGAGGCCACCCATCT CCGCCATGGAACTGAGCACAAACAGCAACAGCTGTATGTTGGCTCC GCCGCTGGTGTGCTCAACTGCTCTGCACAGATGGACATCTACGG CAAAGCCTGCGCAGGTGTTGCTGGCAGAGATCCTTACTGTGCT GGGATGGCAGCAGCTGAGCAGATACTTCCACCCCAAGCGAG AACCAAGACGGCAGGATATCAGAAACGGCAGCCCTCTGACACACTGC AGCGACGGTGGCATCGAGGGCGCATGGATCATCATCACCATCA T

SEQUENCE LISTING

<160> NUMBER OF SEQ ID NOS: 885

<210> SEQ ID NO 1

<211> LENGTH: 124

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 1

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1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30

Pro Met Gly Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ala Gly Ile Asp Asp Asp Gly Asp Ser Asp Thr Arg Tyr Ala Pro Ala
50 55 60

Val Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Val
65 70 75 80

Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr

Cys Ala Lys His Thr Gly Ile Gly Ala Asn Ser Ala Gly Ser Ile Asp

Ala Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser

<210> SEQ ID NO

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM

<220> FEATURE:

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<400> SEQUENCE: 2

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Ser Tyr Pro Met Gly
1           5
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<210> SEQ ID NO 3
<211> LENGTH: 18
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
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<400> SEQUENCE: 3

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Gly Ile Asp Asp Asp Gly Asp Ser Asp Thr Arg Tyr Ala Pro Ala Val
1           5           10          15
```

Lys Gly

```
<210> SEQ ID NO 4
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
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<400> SEQUENCE: 4

```
His Thr Gly Ile Gly Ala Asn Ser Ala Gly Ser Ile Asp Ala
1           5           10
```

```
<210> SEQ ID NO 5
<211> LENGTH: 108
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
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<400> SEQUENCE: 5

```
Ser Tyr Glu Leu Thr Gln Pro Pro Ser Val Ser Val Ser Pro Gly Gln
1           5           10          15
```

```
Thr Ala Arg Ile Thr Cys Ser Gly Gly Ser Tyr Thr Gly Ser Tyr
20          25          30
```

```
Tyr Tyr Gly Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Thr Val
35          40          45
```

```
Ile Tyr Tyr Asn Asn Lys Arg Pro Ser Asp Ile Pro Glu Arg Phe Ser
50          55          60
```

```
Gly Ser Leu Ser Gly Thr Thr Asn Thr Leu Thr Ile Ser Gly Val Gln
65          70          75          80
```

```
Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Ala Asp Asn Ser Gly
85          90          95
```

```
Asp Ala Phe Gly Thr Gly Thr Lys Val Thr Val Leu
100         105
```

```
<210> SEQ ID NO 6
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
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<400> SEQUENCE: 6

```
Ser Gly Gly Ser Tyr Thr Gly Ser Tyr Tyr Tyr Gly
1           5           10
```

-continued

<210> SEQ ID NO 7
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 7

Tyr Asn Asn Lys Arg Pro Ser
1 5

<210> SEQ ID NO 8
<211> LENGTH: 9
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 8

Gly Ser Ala Asp Asn Ser Gly Asp Ala
1 5

<210> SEQ ID NO 9
<211> LENGTH: 372
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 9

gaagttcagc tgctggaaatc tggggccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggctt cacctttagc agctatccta tgggctgggt ccgacaggcc	120
cctggcaaag gacttgaatg ggtggccggt atcgacgacg atggcgatag cgataacaaga	180
tacggcccctg ccgtgaaggg cagagccacc atctccagag acaacagcaa gaacaccgtg	240
tacctgcaga tgaacagcct gagagccgag gacaccgecc tgtactattg tgccaagcac	300
acaggcatcg ggcgcattc tgccggctct attgtatgcct ggggccaggg aacactggtc	360
acagtttctt ca	372

<210> SEQ ID NO 10
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 10

agctatccta tgggc	15
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<210> SEQ ID NO 11
<211> LENGTH: 54
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 11

ggcatcgacg acgatggcga tagcgataca agatacgccc ctgcccgtgaa gggc	54
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<210> SEQ ID NO 12
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:

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<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 12

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42

<210> SEQ ID NO 13

<211> LENGTH: 324

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 13

agctatgagc tgacacagcc tccaagcgtg tccgtgtctc ctggacagac cgccagaatc	60
acatgttagcg gcggaggcag ctacacccgc agctactact atggctggta tcagcagaag	120
cccgacagg cccctgtgac cgtatctac tacaacaaca agcggcccgag cgacatcccc	180
gagagatttt ctggctctct gageggcacc accaacacac tgacaatctc tggcgtgcag	240
gccgaggcag aggccgatta ctattgtggc agcgccgata atagcggcga cgccttggc	300
accggcacca aagttacagt gcta	324

<210> SEQ ID NO 14

<211> LENGTH: 39

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 14

agcggcgag gcagctacac cggcagctac tactatggc

39

<210> SEQ ID NO 15

<211> LENGTH: 21

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 15

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21

<210> SEQ ID NO 16

<211> LENGTH: 27

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 16

ggcagcgccg ataatacgcc cgacgcc

27

<210> SEQ ID NO 17

<211> LENGTH: 453

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 17

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly			
1	5	10	15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr		
20	25	30

-continued

Pro Met Gly Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45
 Ala Gly Ile Asp Asp Asp Gly Asp Ser Asp Thr Arg Tyr Ala Pro Ala
 50 55 60
 Val Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Val
 65 70 75 80
 Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr
 85 90 95
 Cys Ala Lys His Thr Gly Ile Gly Ala Asn Ser Ala Gly Ser Ile Asp
 100 105 110
 Ala Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys
 115 120 125
 Gly Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly
 130 135 140
 Gly Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro
 145 150 155 160
 Val Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr
 165 170 175
 Phe Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val
 180 185 190
 Val Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn
 195 200 205
 Val Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro
 210 215 220
 Lys Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu
 225 230 235 240
 Leu Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp
 245 250 255
 Thr Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp
 260 265 270
 Val Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly
 275 280 285
 Val Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn
 290 295 300
 Ser Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp
 305 310 315 320
 Leu Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro
 325 330 335
 Ala Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu
 340 345 350
 Pro Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn
 355 360 365
 Gln Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile
 370 375 380
 Ala Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr
 385 390 395 400
 Thr Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys
 405 410 415
 Leu Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys
 420 425 430
 Ser Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu
 435 440 445

-continued

Ser Leu Ser Pro Gly
450

<210> SEQ ID NO 18
<211> LENGTH: 214
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 18

Ser Tyr Glu Leu Thr Gln Pro Pro Ser Val Ser Val Pro Gly Gln
1 5 10 15

Thr Ala Arg Ile Thr Cys Ser Gly Gly Ser Tyr Thr Gly Ser Tyr
20 25 30

Tyr Tyr Gly Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Thr Val
35 40 45

Ile Tyr Tyr Asn Asn Lys Arg Pro Ser Asp Ile Pro Glu Arg Phe Ser
50 55 60

Gly Ser Leu Ser Gly Thr Thr Asn Thr Leu Thr Ile Ser Gly Val Gln
65 70 75 80

Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Ala Asp Asn Ser Gly
85 90 95

Asp Ala Phe Gly Thr Gly Thr Lys Val Thr Val Leu Gly Gln Pro Lys
100 105 110

Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Gln
115 120 125

Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr Pro Gly
130 135 140

Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys Ala Gly
145 150 155 160

Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr Ala Ala
165 170 175

Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His Arg Ser
180 185 190

Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys Thr Val
195 200 205

Ala Pro Thr Glu Cys Ser
210

<210> SEQ ID NO 19
<211> LENGTH: 1359
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 19

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agctgtgcgg ccagcggtt caccttagc agctatccta tgggctgggt ccgacaggcc 120

cctggcaaag gacttgaatg ggtggccggt atcgacgacg atggcgatag cgataacaaga 180

tacggccctg ccgtgaaggg cagagccacc atctccagag acaacacgcaa gaacaccgtg 240

tacctgcaga tgaacagcct gagagccgag gacaccgccc tgtactatgg tgccaagcac 300

acaggcatcg gcgccaaattc tgccggctt attgatgcct ggggccaggg aacactggtc 360

acagtttctt cagccagcac caagggcccc agcgtgttcc ctctggcccc tagcagcaag 420

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225

226

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agcacatctg	gcggAACAGC	cgcctggc	tgcctcgta	aggactactt	tcccgagccc	480
gtgaccgtgt	cctggAACTC	tggegctctg	acaagcggc	tgcacaccc	tccagccgtg	540
ctgcagagca	gcggcctgt	ctctctgago	agegtcgta	cagtgeccag	cagctctctg	600
ggcacccaga	cctacatctg	caacgtgaac	cacaagccca	gcaacaccaa	ggtggacaag	660
aagggtggAAC	ccaagagctg	cgacaagAC	cacacctgtc	ccccctgtcc	tgcccccggaa	720
ctgctgggg	gcccttcgt	gttctgttc	cccccaaAGC	ccaaggacac	cctgtatgtc	780
agccggaccc	ccgaagtGAC	ctgcgtgg	gtggatgtgt	cccacgagga	ccctgaagtG	840
aagttcaatt	ggtacgtgg	cgcggtggaa	gtgcacaACG	ccaagaccaa	gccttagagAG	900
gaacagtaca	acagcaccta	cggggtgg	tccgtgt	cagtgtca	ccaggactgg	960
ctgaacggca	aagagtacaa	gtgcaagg	tccaacaagg	ccctgcctgc	ccccatcgag	1020
aaaaccatca	gcaaggccaa	gggcagccc	cgcgaacccc	aggtgtacac	actgccccca	1080
agcaggacg	agctgaccaa	gaaccagg	tccctgac	gtctcgtaa	aggcttctac	1140
ccctccgata	tcgcccgt	atggagago	aacggccagc	ccgagaacaa	ctacaagacc	1200
accccccctg	tgctggacag	cgacggctca	ttttccctgt	acagcaagct	gaccgtggac	1260
aagtcccggt	ggcagcaggg	caacgtgtt	agctgcagcg	tgtatgcacga	ggccctgcac	1320
aaccactaca	cccagaagtc	cctgagcctg	agccctggc			1359

<210> SEQ ID NO 20

<211> LENGTH: 642

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 20

agctatgagc	tgacacagcc	tccaagcgtg	tccgtgtctc	ctggacagac	cgcagaatc	60
acatgtacgc	gcggaggcag	ctacacggc	agctactact	atggctggta	tcagcagaag	120
cccgacagg	cccctgtgac	cgtatctac	tacaacaaca	agcgcccgag	cgcacatcccc	180
gagagatTTT	ctggctctct	gagcgccacc	accaacacac	tgacaatctc	tggcgtgcag	240
gccgaggacg	aggccgatta	ctattgtgg	agcgccgata	atagcgccga	cgcccttggc	300
accggccacca	aagttacagt	gtctggccag	cctaaagccg	cccctagcgt	gaccctgttc	360
cctccaagca	gcgaggaact	gcaggccaac	aaggccaccc	tcgtgtgcct	gatcagcgcac	420
ttctatctcg	gcgcgtgac	cgtggctgg	aaggccgata	gtctctctgt	gaaggccggc	480
gtggaaacca	ccacccctag	caagcagac	aacaacaaat	acgcccacag	cagctacctg	540
agectgaccc	ccgagcagtg	gaagtccac	agatcctaca	gtgcacagt	gaccacgag	600
ggcagcaccc	tggaaaagac	agtggccct	accgagtgca	gc		642

<210> SEQ ID NO 21

<211> LENGTH: 124

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 21

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Ley	Val	Gln	Pro	Gly	Gly
1					5		10			15					
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
20					25					30					

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Pro Met Gly Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45

Ala Gly Ile Asp Asp Asp Gly Asp Ser Asp Thr Arg Tyr Ala Pro Ala
 50 55 60

Val Lys Gly Arg Ala Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Val
 65 70 75 80

Tyr Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr
 85 90 95

Cys Ala Lys His Thr Gly Ile Gly Ala Asn Ser Ala Gly Ser Ile Asp
 100 105 110

Ala Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> SEQ ID NO 22

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 22

Ser Tyr Pro Met Gly
 1 5

<210> SEQ ID NO 23

<211> LENGTH: 18

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 23

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

Lys Gly

<210> SEQ ID NO 24

<211> LENGTH: 14

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 24

His Thr Gly Ile Gly Ala Asn Ser Ala Gly Ser Ile Asp Ala
 1 5 10

<210> SEQ ID NO 25

<211> LENGTH: 108

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 25

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

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Ile	Tyr	Tyr	Asn	Asn	Lys	Arg	Pro	Ser	Asp	Ile	Pro	Glu	Arg	Phe	Ser
50					55					60					

Gly	Ser	Leu	Ser	Gly	Thr	Thr	Asn	Thr	Leu	Thr	Ile	Ser	Gly	Val	Gln
65				70					75				80		

Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Gly	Ser	Ala	Asp	Asn	Ser	Gly
	85				90				95						

Asp	Ala	Phe	Gly	Thr	Gly	Thr	Lys	Val	Thr	Val	Leu				
		100						105							

<210> SEQ ID NO 26

<211> LENGTH: 13

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 26

Ser	Gly	Gly	Gly	Ser	Tyr	Thr	Gly	Ser	Tyr	Tyr	Tyr	Gly			
1				5				10							

<210> SEQ ID NO 27

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 27

Tyr	Asn	Asn	Lys	Arg	Pro	Ser									
1			5												

<210> SEQ ID NO 28

<211> LENGTH: 9

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 28

Gly	Ser	Ala	Asp	Asn	Ser	Gly	Asp	Ala							
1				5											

<210> SEQ ID NO 29

<211> LENGTH: 372

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 29

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcggtc tctgagactg 60

agctgtgcgg ccagcggtt cacctttagc agctatccta tgggctgggt ccgacaggcc 120

cctggcaaag gacttgaatg ggtggccggo atcgacgacg atggcgatag cgataacaaga 180

tacggcccgt ccgtgaaggg cagagccacc atctccagag acaacagcaa gaacaccgtg 240

tacctgcaga tgaacacgcct gagagccgag gacaccgccc tgtactattg tgccaagcac 300

acaggcatcg gcgccaaattc tgccggctct attgtatgcct ggggccaggg aacactggtc 360

acagtttctt ca 372

<210> SEQ ID NO 30

<211> LENGTH: 15

<212> TYPE: DNA

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<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 30

agctataccta tgggc                                         15

<210> SEQ ID NO 31
<211> LENGTH: 54
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 31

ggcatcgacg acgtatggcga tagcgataca agatacgccc ctgccgtgaa gggc      54

<210> SEQ ID NO 32
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 32

cacacaggca tcggcgccaa ttctgccggc tctattgtatg cc                         42

<210> SEQ ID NO 33
<211> LENGTH: 324
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 33

agctatgagc tgacacagcc tccaagcgtg tccgtgtctc ctggacagac cgccagaatc      60
acatgttagcg gcggaggcag ctacacccggc agctactact atggctggta tcagcagaag    120
ccccggacagg cccctgtgac cgtgatctac tacaacaaca agcggcccaag cgacatcccc   180
gagagatttt ctggctctct gagcggcacc accaacacac tgacaatctc tggcgtgcag    240
ggcgaggacg aggccgatta ctattgtggc agcggcgata atagcggcga cgcccttggc    300
accggcacca aagttagtact gcta                                         324

<210> SEQ ID NO 34
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 34

agcggcggag gcagctacac cggcagctac tactatggc                           39

<210> SEQ ID NO 35
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 35

tacaacaaca agcggcccaag c                                         21

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<210> SEQ ID NO 36
<211> LENGTH: 27
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 36

ggcagcgccg ataatagcgg cgacgcc

27

<210> SEQ ID NO 37
<211> LENGTH: 448
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 37

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1							5		10			15			

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
								20		25		30			

Pro	Met	Gly	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
								35		40		45			

Ala	Gly	Ile	Asp	Asp	Asp	Gly	Asp	Ser	Asp	Thr	Arg	Tyr	Ala	Pro	Ala
								50		55		60			

Val	Lys	Gly	Arg	Ala	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Val
						65		70		75		80			

Tyr	Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr
								85		90		95			

Cys	Ala	Lys	His	Thr	Gly	Ile	Gly	Ala	Asn	Ser	Ala	Gly	Ser	Ile	Asp
						100		105		110					

Ala	Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Lys	Thr	Thr
						115		120		125					

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

Ser	Met	Val	Thr	Leu	Gly	Cys	Leu	Val	Lys	Gly	Tyr	Phe	Pro	Glu	Pro
						145		150		155		160			

Val	Thr	Val	Thr	Trp	Asn	Ser	Gly	Ser	Leu	Ser	Ser	Gly	Val	His	Thr
						165		170		175					

Phe	Pro	Ala	Val	Leu	Gln	Ser	Asp	Leu	Tyr	Thr	Leu	Ser	Ser	Val	
						180		185		190					

Thr	Val	Pro	Ser	Ser	Thr	Trp	Pro	Ser	Glu	Thr	Val	Thr	Cys	Asn	Val
						195		200		205					

Ala	His	Pro	Ala	Ser	Ser	Thr	Lys	Val	Asp	Lys	Lys	Ile	Val	Pro	Arg
						210		215		220					

Asp	Cys	Gly	Cys	Lys	Pro	Cys	Ile	Cys	Thr	Val	Pro	Glu	Val	Ser	Ser
						225		230		235		240			

Val	Phe	Ile	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Val	Leu	Thr	Ile	Thr	Leu
						245		250		255					

Thr	Pro	Lys	Val	Thr	Cys	Val	Val	Val	Asp	Ile	Ser	Lys	Asp	Asp	Pro
						260		265		270					

Glu	Val	Gln	Phe	Ser	Trp	Phe	Val	Asp	Asp	Val	Glu	Val	His	Thr	Ala
						275		280		285					

Gln	Thr	Gln	Pro	Arg	Glu	Glu	Gln	Phe	Asn	Ser	Thr	Phe	Arg	Ser	Val
						290		295		300					

Ser Glu Leu Pro Ile Met His Gln Asp Trp Leu Asn Gly Lys Glu Phe

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305	310	315	320
Lys Cys Arg Val Asn Ser Ala Ala Phe Pro Ala Pro Ile Glu Lys Thr			
325	330	335	
Ile Ser Lys Thr Lys Gly Arg Pro Lys Ala Pro Gln Val Tyr Thr Ile			
340	345	350	
Pro Pro Pro Lys Glu Gln Met Ala Lys Asp Lys Val Ser Leu Thr Cys			
355	360	365	
Met Ile Thr Asp Phe Phe Pro Glu Asp Ile Thr Val Glu Trp Gln Trp			
370	375	380	
Asn Gly Gln Pro Ala Glu Asn Tyr Lys Asn Thr Gln Pro Ile Met Asp			
385	390	395	400
Thr Asp Gly Ser Tyr Phe Val Tyr Ser Lys Leu Asn Val Gln Lys Ser			
405	410	415	
Asn Trp Glu Ala Gly Asn Thr Phe Thr Cys Ser Val Leu His Glu Gly			
420	425	430	
Leu His Asn His His Thr Glu Lys Ser Leu Ser His Ser Pro Gly Lys			
435	440	445	

<210> SEQ ID NO 38

<211> LENGTH: 214

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 38

Ser Tyr Glu Leu Thr Gln Pro Pro Ser Val Ser Val Pro Gly Gln			
1	5	10	15
Thr Ala Arg Ile Thr Cys Ser Gly Gly Ser Tyr Thr Gly Ser Tyr			
20	25	30	
Tyr Tyr Gly Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Thr Val			
35	40	45	
Ile Tyr Tyr Asn Asn Lys Arg Pro Ser Asp Ile Pro Glu Arg Phe Ser			
50	55	60	
Gly Ser Leu Ser Gly Thr Thr Asn Thr Leu Thr Ile Ser Gly Val Gln			
65	70	75	80
Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ser Ala Asp Asn Ser Gly			
85	90	95	
Asp Ala Phe Gly Thr Gly Thr Lys Val Thr Val Leu Gly Gln Pro Lys			
100	105	110	
Ser Ser Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu Leu Glu			
115	120	125	
Thr Asn Lys Ala Thr Leu Val Cys Thr Ile Thr Asp Phe Tyr Pro Gly			
130	135	140	
Val Val Thr Val Asp Trp Lys Val Asp Gly Thr Pro Val Thr Gln Gly			
145	150	155	160
Met Glu Thr Thr Gln Pro Ser Lys Gln Ser Asn Asn Lys Tyr Met Ala			
165	170	175	
Ser Ser Tyr Leu Thr Leu Thr Ala Arg Ala Trp Glu Arg His Ser Ser			
180	185	190	
Tyr Ser Cys Gln Val Thr His Glu Gly His Thr Val Glu Lys Ser Leu			
195	200	205	
Ser Arg Ala Asp Cys Ser			
210			

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<210> SEQ ID NO 39
<211> LENGTH: 1344
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 39

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt caccttagc agctatccta tgggctgggt ccgacaggcc	120
cctggcaaag gacttgaatg ggtggccgga atcgacgacg atggcgatag cgataacaaga	180
tacggccctg ccgtgaaggg cagagccacc atctccagag acaacaccaa gaacaccgtg	240
tacctgcaga tgaacagcct gagagccgag gacaccgccc tgtactattg tgccaagcac	300
acaggcatcg ggcgcattc tgccggctctt attgtatgcctt gggggccaggg aacactggtc	360
acagtttctt cagccaagac caccggggggc agcggttacc ctctggatcc tggatctgcc	420
gccccagacca acagcatgggt caccctggggc tgcctcgatg agggtctactt ccctgagcc	480
gtgaccgtga cctgaaacag cggctctctg tctagcgccg tgcacaccc ttccagccgtg	540
ctgcagagcg acctgtacac cctgagcago agcggttacc tgcctcgatg caccctggcc	600
agcgagacag tgacactgaa cgtggccac cctgcccggca gacaaaagggt ggacaagaaa	660
atcggtcccc gggactgcgg ctgcaagccc tggatctgtt ccgtggccgg ggtgtccagc	720
gtgttcatct tcccaaaaaa gccccaggac gtgctgacca tcaccctgac ccccaaaagt	780
acctgtgtgg tggggacat cagcaaggac gacccggagg tgcagttcag ttgggtcg	840
gacgacgtgg aagtgcacac agcccgaccc cagcccgaggg aggaacagtt caacagcacc	900
ttcagaagcg tggccggact gccccatcg caccaggact ggctgaaacgg caaagagttc	960
aagtgcagag tgaacagcgc cgcctccctt gccccatcg agaaaaccat ctccaagacc	1020
aaggccgaccc ccaaggcccc tcagggttac acaatcccc caccggaa acatggcc	1080
aaggacaagg tggccctgac ctgcgttac accgatttctt tcccaaggagga cataccgt	1140
aatggcactt ggaacggcca gccccccggag aactacaaga acacccggcc tatcatggac	1200
accggacggca gctacttcgt gtacagcaag ctgaaacgtgc agaagtccaa ctggggggcc	1260
ggcaacaccc ttacacctgt tag cgtgtgcac gaggccctgc acaatcacca caccggaaag	1320
tccctgtccc acagccctgg caag	1344

<210> SEQ ID NO 40
<211> LENGTH: 642
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 40

agctatgagc tgacacagcc tccaaagcgtg tccgtgtctc ctggacagac cgccagaatc	60
acatgttagcg gggggggcag ctacaccggc agctactact atggctggta tcagcagaag	120
cccgccggagg cccctgtgac cgtgtatctac tacaacaaca agccggcccgccgacatcccc	180
gagagatttt ctggctctt gagccggacc accaacacac tgacaatctc tggcgatcg	240
gccggggacgg aggccgatca ctattgtggc agcgccgata atagcgccgaa cgcctttggc	300
accggccacca aagttagtactt gcttagggccag cccaaaggac gcccttagcgt gaccctgttc	360
cctccaaagca gcgaggaaact ggaaacaaac aaggccaccc tgcgtgtgcac catcaccgac	420

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ttctaccccg	gcgtcgtgac	cgtggactgg	aaggtggacg	gcaccccaagt	gaccaggc	480
atggaaacca	cccagccccag	caagcagago	aacaacaagt	acatggccag	cagctacctg	540
accctgaccg	ccagagcctg	ggagagacac	agtcctaca	gctgccaagt	gaccacgag	600
ggccacacccg	tggaaaagag	cctgagcaga	gccgactgca	gc		642

<210> SEQ ID NO 41
<211> LENGTH: 120
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 41

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Ley	Val	Gln	Pro	Gly	Gly
1							5				10			15	
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
								20		25		30			
Gly	Met	His	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
	35							40			45				
Ser	Ala	Ile	Gly	Thr	Gly	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Met
	50						55		60						
Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr	Leu
	65						70		75		80				
Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	Ala
	85						90				95				
Arg	Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Val	Trp	Gly	Gln
	100						105				110				
Gly	Thr	Leu	Val	Thr	Val	Ser	Ser								
	115						120								

<210> SEQ ID NO 42
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 42

Ser	Tyr	Gly	Met	His
1				5

<210> SEQ ID NO 43
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 43

Ala	Ile	Gly	Thr	Gly	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Met	Gly
1							5						10		15

<210> SEQ ID NO 44
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 44

Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Val
-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----	-----

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<210> SEQ ID NO 45
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 45

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Leu Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
85 90 95

Asn Gly Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

```

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<210> SEQ ID NO 46
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 46

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Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
1 5 10

```

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<210> SEQ ID NO 47
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 47

Tyr Asp Asp Leu Leu Pro Ser
1 5

```

```

<210> SEQ ID NO 48
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 48

Ala Ala Trp Asp Asp Ser Leu Asn Gly Tyr Val Val
1 5 10

```

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<210> SEQ ID NO 49
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 49

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt caccttagc agctatggca tgcactgggt ccgacaggcc	120
cctggcaaaag gacttgaatg ggtgtccgccc atcggcacag gccccgatac ctactatgcc	180
gatagcgtga tgggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggacgac	300
tacaccagca gggatgcctt cgatgtgtgg ggccaggaa cactggttac cgtttcttca	360

<210> SEQ ID NO 50

<211> LENGTH: 15

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 50

agctatggca tgcac	15
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<210> SEQ ID NO 51

<211> LENGTH: 48

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 51

gccatcggca caggcggcga tacctactat gccgatagcg tcatgggc	48
--	----

<210> SEQ ID NO 52

<211> LENGTH: 36

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 52

agggacgact acaccagcag ggatgccttc gatgtg	36
---	----

<210> SEQ ID NO 53

<211> LENGTH: 333

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 53

cagtctgttc tgacacagcc tcctagcgcc tctggcacac ctggacagag agtggaccatc	60
agctgttagcg gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg	120
cctggcacag cccctaaact gctgtatctac tacgacgacc tgctgcctag cggcgtgccc	180
gatagatttt ctggcagcaa gagcggcaca agcgccagcc tggctatctc tggactgaga	240
tctgaggacg aggccgacta ctattgcgcgc gcctggacg atagcctgaa cggctatgtg	300
gttttcggcg gaggcaccaa gctgaccgtg cta	333

<210> SEQ ID NO 54

<211> LENGTH: 39

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

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-continued

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 54

agcggcagca gctccaaacat cggcagcaac accgtgaac

39

<210> SEQ ID NO 55

<211> LENGTH: 21

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 55

tacgacgacc tgctgcctag c

21

<210> SEQ ID NO 56

<211> LENGTH: 36

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 56

gccgcctggg acgatagcct gaacggctat gtggtt

36

<210> SEQ ID NO 57

<211> LENGTH: 449

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 57

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30Gly Met His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45Ser Ala Ile Gly Thr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Met
50 55 60Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
65 70 75 80Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Val Trp Gly Gln
100 105 110Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
115 120 125Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala
130 135 140Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
145 150 155 160Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
165 170 175Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
180 185 190Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys
195 200 205**246**

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Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp
210 215 220

Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly
225 230 235 240

Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile
245 250 255

Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu
260 265 270

Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His
275 280 285

Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg
290 295 300

Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys
305 310 315 320

Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu
325 330 335

Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr
340 345 350

Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu
355 360 365

Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp
370 375 380

Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val
385 390 395 400

Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp
405 410 415

Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His
420 425 430

Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro
435 440 445

Gly

<210> SEQ ID NO 58
<211> LENGTH: 217
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 58

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Leu Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
85 90 95

Asn Gly Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105 110

Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu

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115	120	125	
Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe			
130	135	140	
Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val			
145	150	155	160
Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys			
165	170	175	
Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser			
180	185	190	
His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu			
195	200	205	
Lys Thr Val Ala Pro Thr Glu Cys Ser			
210	215		

<210> SEQ ID NO 59

<211> LENGTH: 1347

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 59

gaagttcagc tgctggaatc tggcgccgga ctgggttcaac ctggcggtac tctgagactg	60
agctgtgccg ccagcggctt caccttagc agctatggca tgcactgggt ccgacaggcc	120
cctggcaaag gacttgaatg ggtgtccgcc atcggcacag gcggcgatac ctactatgcc	180
gatagcgtga tgggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggacgac	300
tacaccagca gggatgcctt cgatgtgtgg ggccaggaa cactggttac cgtttctca	360
gccagcacca agggccccag cgtgttcctt ctggccccta gcagcaagag cacatctggc	420
ggaacagcgc ccctgggctg cctcgtgaag gactacttc ccgagccgt gaccgtgtcc	480
tggaactctg ggcgtctgac aagcggcgtg cacaccttc cagccgtgt gcagagcagc	540
ggcctgtact ctctgagcag cgtcgtgaca gtgcccagca gctctctggg caccagacc	600
tacatctgca acgtgaacca caagcccagg aacaccaagg tggacaagaa ggtggAACCC	660
aagagctgcg acaagaccca cacctgtccc cttgtcctg ccccccgaact gctggaggc	720
cctccgtgt tcctgttccc cccaaagccc aaggacaccc tgatgatcag ccggaccccc	780
gaagtgaccc gctgtgggtt ggtatgtgtcc cacgaggacc ctgaagtgaa gttcaattgg	840
tacgtggacg gctgtggaaat gcacaacgc aagaccaagg ctagagagga acagtacaac	900
agcacctacc ggggtgggtc cgtcgtgaca gtgctgcacc aggactggct gaacggcaaa	960
gagtaacaagt gcaagggtgtc caacaaggcc ctgcctgccc ccatcgagaa aaccatcagc	1020
aaggccaagg gccagccccg cgaacccccag gtgtacacac tgcccccaag cagggacgag	1080
ctgaccaaga accagggtgtc cctgacacctgt ctctgtaaa gcttctaccc ctccgatatc	1140
gccgtggaaat gggagagcaa cggccagccc gagaacaact acaagaccac cccccctgtg	1200
ctggacacgcg acggctcatt cttctgtac agcaagctga ccgtggacaa gtcccggtgg	1260
cagcagggca acgtgttcag ctgcagcgtg atgcacgagg ccctgcacaa ccactacacc	1320
cagaagtcccc tgagcctgag ccctggc	1347

<210> SEQ ID NO 60

<211> LENGTH: 651

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 60

```
cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttagcg gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg      120
cctggcacag cccctaact gctgtatcac tacgacgacc tgctgectag cggcgtgccc      180
gatagatttt ctggcagcaa gagcggcaca agcgcgcagcc tggctatctc tggactgaga      240
tctgaggacg aggccgacta ctattgcgcc gcctgggacg atagcctgaa cggctatgtg      300
gttttcggcg gaggcaccaa gctgaccgtg ctaggccagc ctaaagccgc ccctagcgtg      360
accctgttcc ctccaagcag cgaggaactg caggccaaca aggccacctt cgtgtgcctg      420
atcagcgaact tctatcctgg cgccgtgacc gtggcctgga aggccgatag ctctcctgtg      480
aaggccggcg tggaaaccac cacccttagc aagcagagac acaacaata cgccgcacgc      540
agotacctga gcctgacccc cgagoagtgg aagtcccaca gatcctacag ctgccaagtg      600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c      651
```

<210> SEQ ID NO 61
<211> LENGTH: 123
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 61

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Ley	Val	Gln	Pro	Gly	Gly	
1															
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
20															
Glu	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
35															
Ser	Gly	Ile	Ser	Trp	Asn	Ser	Gly	Ser	Ile	Gly	Tyr	Ala	Asp	Ser	Val
50															
Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr
65															
Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
85															
Ala	Arg	Ser	Gly	Tyr	Ser	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
100															
Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser					
115															

<210> SEQ ID NO 62
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 62

Ser	Tyr	Glu	Met	Asn
1				

<210> SEQ ID NO 63
<211> LENGTH: 17

-continued

<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 63

Gly	Ile	Ser	Trp	Asn	Ser	Gly	Ser	Ile	Gly	Tyr	Ala	Asp	Ser	Val	Lys
1						5			10					15	

Gly

<210> SEQ ID NO 64
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 64

Ser	Gly	Tyr	Ser	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
1						5			10				

<210> SEQ ID NO 65
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 65

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1					5			10			15				

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly
			20			25					30				

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
					35			40			45				

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
	50			55			60								

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu
65				70			75			80					

Arg	Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ser	Ser	Tyr	Ala	Gly	Ser
	85				90				95						

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu		
	100				105				110						

<210> SEQ ID NO 66
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 66

Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly	Tyr	Asp	Val	His
1					5			10					

<210> SEQ ID NO 67
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 67

-continued

Gly Asn Ser Asn Arg Pro Ser
1 5

<210> SEQ ID NO 68
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 68

Ser Ser Tyr Ala Gly Ser Asn Pro Tyr Val Val
1 5 10

<210> SEQ ID NO 69
<211> LENGTH: 369
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 69

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggctt cacctttagc agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccggc atcagctggta atagcggctc tatcggtac	180
gccgacagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcgtgt actactgtgc cagaaggccc	300
tacagcagct cttgggttga ccccgacttc gactattggg gccagggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 70
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 70

agctacgaga tgaac	15
------------------	----

<210> SEQ ID NO 71
<211> LENGTH: 51
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 71

ggcatcagct ggaatagcgg ctctatcggc tacggcaca gctgtaaaggc	51
--	----

<210> SEQ ID NO 72
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 72

agcggctaca gcaatctttg gtttgacccc gacttcgact at	42
--	----

<210> SEQ ID NO 73
<211> LENGTH: 333

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 73

```
cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttaccg gcagcagctc caatatcgga gccggctatg acgtgcactg gtatcagcag      120
ctgcctggca cagccccctaa actgtgtatc tacggcaaca gcaacagacc cagccggctg      180
cccgtatagat ttccggctc taagagcggc acaaggcgc aacctggctat ctctggactg      240
agatctgagg acgaggccga ctactactgc agcagctatg ccggcagcaa cccctacgtt      300
gtgtttggcg gaggcaccaa gctgaccgtt cta                                333
```

<210> SEQ ID NO 74
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 74

```
acoggcagca gctccaatat cggagccggc tatgacgtgc ac                                42
```

<210> SEQ ID NO 75
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 75

```
ggcaacagca acagacccag c                                21
```

<210> SEQ ID NO 76
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 76

```
agcagctatg ccggcagcaa cccctacgtt gtg                                33
```

<210> SEQ ID NO 77
<211> LENGTH: 452
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 77

```
Glu Val Gln Leu Leu Glu Ser Gly Gly Leu Val Gln Pro Gly Gly
1           5          10          15
```

```
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20          25          30
```

```
Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35          40          45
```

```
Ser Gly Ile Ser Trp Asn Ser Gly Ser Ile Gly Tyr Ala Asp Ser Val
50          55          60
```

```
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65          70          75          80
```

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Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 100 105 110
 Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
 115 120 125
 Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
 130 135 140
 Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
 145 150 155 160
 Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
 165 170 175
 Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
 180 185 190
 Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
 195 200 205
 Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
 210 215 220
 Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 225 230 235 240
 Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 245 250 255
 Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 260 265 270
 Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 275 280 285
 Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 290 295 300
 Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 305 310 315 320
 Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 325 330 335
 Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 340 345 350
 Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
 355 360 365
 Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
 370 375 380
 Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
 385 390 395 400
 Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 405 410 415
 Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 420 425 430
 Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 435 440 445
 Leu Ser Pro Gly
 450

260

```

<210> SEQ ID NO 78
<211> LENGTH: 217
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
  
```

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<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 78

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1					5				10				15		

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly
					20			25				30			

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
					35			40			45				

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
					50			55			60				

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu
					65			70			75			80	

Arg	Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ser	Ser	Tyr	Ala	Gly	Ser
					85			90			95				

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly
					100			105			110			

Gln	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	Glu
					115			120			125				

Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	Phe
					130			135			140				

Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	Val
					145			150			155			160	

Lys	Ala	Gly	Val	Glu	Thr	Thr	Pro	Ser	Lys	Gln	Ser	Asn	Asn	Lys
					165			170			175			

Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	Ser
					180			185			190				

His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	Glu
					195			200			205				

Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser
					210			215

<210> SEQ ID NO 79

<211> LENGTH: 1356

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 79

gaagttcagc	tgctgaaatc	tggcgccgga	ctgggtcaac	ctggcggttc	tctgagactg	60
agctgtgcgg	ccagcggtt	caccttttagc	agctacgaga	tgaactgggt	ccgacaggcc	120
cctggcaaag	gccttgaatg	ggtgtccggc	atcagctgg	atagcggttc	tatcggttac	180
gcccacagcg	tgaaggccag	attcaccatc	agccgggaca	acagcaagaa	caccctgtac	240
ctgcagatga	acagcgctgag	agccgaggac	accggcggt	actactgtgc	cagaaggccgc	300
tacagcgact	cttgggttga	ccccgacttc	gactattggg	gccaggccac	actggtcaca	360
gtctcttcag	ccagcaccaa	ggggccccago	gtgttccctc	tggcccccgt	cagcaagagc	420
acatctggcg	gaacagccgc	cctgggctgc	ctcgtgaagg	actacttcc	cgagcccggt	480
accgtgtctt	ggaactctgg	cgctctgaca	agccggcgtgc	acacctttcc	agccgtgtcg	540
cagagcagcg	gcctgtactc	tctgagccgac	gtcgtgacag	tggccagccag	ctctctgggc	600
acccagacct	acatctgcaa	cgtgaaccac	aagcccgac	acaccaaggt	ggacaagaag	660
gtggaaaccca	agagctgcga	caagacccac	acctgtcccc	cttgcctgc	ccccgaaactg	720

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ctgggaggcc	cttcgtgtt	cctgtcccc	ccaaagccc	aggacaccct	gatgtcagc	780
cgacccccc	aagtgcactg	cgtgggtgt	gatgtgtcc	acgaggaccc	tgaagtgaag	840
ttcaatttgt	acgtggacgg	cgtggaaagt	cacaacgcca	agaccaagcc	tagagaggaa	900
cagtacaaca	gcacctaccg	gggtgtgtcc	gtgctgacag	tgctgcacca	ggactggctg	960
aacggcaaag	agtacaagt	caaggtgtcc	aacaaggccc	tgcctgcacc	catcgagaaa	1020
accatcagca	aggccaaggg	ccagccccgc	gaacccccagg	tgtacacact	gcccccaagc	1080
agggacgaga	tgaccaagaa	ccaggtgtcc	ctgacactgtc	tcgtgaaagg	cttctacccc	1140
tccgatatacg	ccgtggaaatg	ggagagcaac	ggccagcccc	agaacaacta	caagaccacc	1200
ccccctgtgc	tggacagcga	cggctcatc	ttctgtaca	gcaagctgac	cgtggacaag	1260
ccccgggtggc	agcaggccaa	cgtgttcago	tgcagcgtga	tgcacgaggc	cctgcacaac	1320
cactacaccc	agaagtccct	gagcctgago	cctggc			1356

<210> SEQ ID NO 80

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 80

cagtctgttc	tgacacagcc	tccttagcgc	tctggcacac	ctggacagag	agtgaccatc	60
agctgtaccg	gcagcagctc	caatatcgga	gccggctatg	acgtgcactg	gtatcagcag	120
ctgcctggca	cagccctaa	actgtgtato	tacggcaaca	gcaacagacc	cagcggcgtg	180
cccgatagat	tttccggctc	taagagcggc	acaagcgc	ccctggctat	ctctggactg	240
agatctgagg	acgaggccga	ctactactgc	agcagctatg	ccggcagcaa	ccctacgtt	300
gtgtttggcg	gaggcacaa	gctgaccgtt	ctaggccagc	ctaaagccgc	ccctagcgtg	360
accctgttcc	ctccaaagcag	cgaggaaactg	caggccaaaca	aggccaccc	cgtgtgcctg	420
atcagcgtact	tctatcctgg	cgccgtgacc	gtggcctgg	aggccgatag	ctctcctgt	480
aaggccggcg	tggaaaccac	caccctago	aagcagagca	acaacaata	cggccacgc	540
agctacctga	gcctgacccc	cgagcagtgg	aagtcccaca	gatcctacag	ctgccaagt	600
acccacgagg	gcagcaccgt	ggaaaagaca	gtggcccta	ccgagtgcag	c	651

<210> SEQ ID NO 81

<211> LENGTH: 116

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 81

Glu	Val	Gln	Leu	Lle	Glu	Ser	Gly	Gly	Ley	Val	Gln	Thr	Gly	Gly	
1					5				10			15			
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Asp	Tyr
					20				25			30			
Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Ley	Glu	Trp	Val
					35				40			45			
Ser	Trp	Ile	Tyr	Tyr	Asp	Ser	Gly	Ser	Lys	Tyr	Tyr	Ala	Asp	Ser	Val
					50				55			60			
Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Ley	Tyr
					65				70			75			80

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Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Lys Leu Asn Gly Asp Phe Asp Tyr Trp Gly Gln Gly Thr Leu Val
 100 105 110
 Thr Val Ser Ser
 115

<210> SEQ ID NO 82
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 82

Asp Tyr Ala Met Ser
 1 5

<210> SEQ ID NO 83
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 83

Trp Ile Tyr Tyr Asp Ser Gly Ser Lys Tyr Tyr Ala Asp Ser Val Lys
 1 5 10 15

Gly

<210> SEQ ID NO 84
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 84

Leu Asn Gly Asp Phe Asp Tyr
 1 5

<210> SEQ ID NO 85
<211> LENGTH: 110
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 85

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn
 20 25 30

Asp Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
 35 40 45

Ile Tyr Ala Asp Ser His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
 50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ala Trp Asp Ser Ser Leu
 85 90 95

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Ser Gly Tyr Val Phe Gly Gly Thr Lys Leu Thr Val Leu
 100 105 110

<210> SEQ ID NO 86
 <211> LENGTH: 13
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 86

Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn Asp Val Ser
 1 5 10

<210> SEQ ID NO 87
 <211> LENGTH: 7
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 87

Ala Asp Ser His Arg Pro Ser
 1 5

<210> SEQ ID NO 88
 <211> LENGTH: 11
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 88

Gly Ala Trp Asp Ser Ser Leu Ser Gly Tyr Val
 1 5 10

<210> SEQ ID NO 89
 <211> LENGTH: 348
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 89

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaaa caggcggttc tctgagactg	60
agctgtgccg cctctggctt caccttcagc gattacgcca tgagctgggt ccgacaggcc	120
cctggaaaag gccttgaatg ggtgtcctgg atctactacg acagcgccag caagtactac	180
gcccacagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accgcccgtgt actattgcgc caagctgaac	300
ggcgacttcg actattgggg ccagggcaca ctggtcacag tctttca	348

<210> SEQ ID NO 90
 <211> LENGTH: 15
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 90

gattacgcca tgagc 15

<210> SEQ ID NO 91
 <211> LENGTH: 51

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<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 91
tggatctact acgacagcgg cagcaagtac tacgcccaca gcgtgaaggg c      51

<210> SEQ ID NO 92
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 92
ctgaacggcg acttcgacta t      21

<210> SEQ ID NO 93
<211> LENGTH: 330
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 93
cagtcgttgc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttagcg gcagcagctc caacatcgcc aacaacgacg tgtcctggta tcagcagctg      120
cctggcacag cccctaaact gctgatctac gccgacagcc acagacctag cggcgtgcca      180
gatagattca gcggtctaa gageggcaca tctgccagcc tggccatctc tggactgaga      240
tctgaggacg aggccgacta ctattgcggc gcctgggatt cttagctgag cggctatgtt      300
tttggcggag gcaccaagct gaccgtgcta      330

<210> SEQ ID NO 94
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 94
agcggcagca gctccaacat cggcaacaac gacgtgtcc      39

<210> SEQ ID NO 95
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 95
gccgacagcc acagacctag c      21

<210> SEQ ID NO 96
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 96
ggcgccctggg attcttagcct gagcggctat gtt      33

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<210> SEQ ID NO 97
 <211> LENGTH: 445
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 97

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Thr	Gly	Gly
1							5			10			15		
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Asp	Tyr
								20		25		30			
Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
	35							40			45				
Ser	Trp	Ile	Tyr	Tyr	Asp	Ser	Gly	Ser	Lys	Tyr	Tyr	Ala	Asp	Ser	Val
	50							55			60				
Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr
	65							70			75			80	
Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
	85							90				95			
Ala	Lys	Leu	Asn	Gly	Asp	Phe	Asp	Tyr	Trp	Gly	Gln	Gly	Thr	Leu	Val
	100							105				110			
Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val	Phe	Pro	Leu	Ala
	115							120				125			
Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly	Thr	Ala	Ala	Leu	Gly	Cys	Leu
	130							135				140			
Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser	Trp	Asn	Ser	Gly
	145							150			155			160	
Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val	Leu	Gln	Ser	Ser
	165							170				175			
Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro	Ser	Ser	Ser	Leu
	180							185				190			
Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	Val	His	Lys	Pro	Ser	Asn	Thr	
	195							200			205				
Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys	Ser	Cys	Asp	Lys	Thr	His	Thr
	210							215			220				
Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu	Leu	Gly	Gly	Pro	Ser	Val	Phe
	225							230			235			240	
Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr	Pro
	245							250			255				
Glu	Val	Thr	Cys	Val	Val	Asp	Val	Ser	His	Glu	Asp	Pro	Glu	Val	
	260							265			270				
Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys	Thr
	275							280				285			
Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser	Val
	290							295			300				
Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys	Cys
	305							310			315			320	
Lys	Val	Ser	Asn	Lys	Ala	Leu	Pro	Ala	Ile	Glu	Lys	Thr	Ile	Ser	
	325							330			335				
Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro	Pro
	340							345			350				
Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu	Val
	355							360			365				

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Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 370 375 380

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 385 390 395 400

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 405 410 415

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 420 425 430

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly
 435 440 445

<210> SEQ ID NO 98
<211> LENGTH: 216
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 98

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Asn Asn
 20 25 30

Asp Val Ser Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
 35 40 45

Ile Tyr Ala Asp Ser His Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
 50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Arg
 65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Gly Ala Trp Asp Ser Ser Leu
 85 90 95

Ser Gly Tyr Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly Gln
 100 105 110

Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu Glu
 115 120 125

Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe Tyr
 130 135 140

Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val Lys
 145 150 155 160

Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys Tyr
 165 170 175

Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser His
 180 185 190

Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu Lys
 195 200 205

Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> SEQ ID NO 99
<211> LENGTH: 1335
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 99

gaagttcagc tgctgaaatc tggcgccgga ctgggttcaaa caggcggttc tctgagactg 60

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agctgtgcgc cctctggcctt cacttcago gattacgcca tgagctgggt ccgacaggcc	120
cctggaaaag gccttgaatg ggtgtcctgg atctactacg acagcggcag caagtactac	180
gccgacacgcg tgaagggcag attcaccato agecgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcgtgt actattgcgc caagctgaac	300
ggcgacttcg actattgggg ccagggcaca ctggtcacag tctcttcagc cagcaccaag	360
ggccccagcg tggccctct ggcccctago ageaagagac catctggcg aacagccgc	420
ctgggctgcc tcgtgaagga ctactttccc gagccgtga ccgtgtcctg gaactctggc	480
gctctgacaa cgccgcgtca caccttcca gccgtgtgc agagcagcgg cctgtactct	540
ctgagcagcg tcgtgacagt gcccagcago tctctggca cccagaccta catctgcaac	600
gtgaaccaca agcccagcaa cacaagggtg gacaagaagg tggaaaccaa gagctgcgac	660
aagacccaca cctgtccccc ttgtcctgcc cccgaactgc tgggaggccc ttccgtgttc	720
ctgttccccc caaagcccaa ggacaccctg atgatcagcc ggaccccccga agtgcacctgc	780
gtgggtgtgg atgtgtccca cgaggaccct gaagtgaagt tcaattggta cgtggacggc	840
gtggaagtgc acaacgccaa gaccaaggct agagaggaac agtacaacag cacctacgg	900
gtgggtgtccg tgctgacagt gctgcaccag gactggctga acggcaaaga gtacaagtgc	960
aagggtgtcca acaaggccct gcctgcccc atcgagaaaa ccatcagcaa ggccaaggc	1020
cagccccgcg aaccccgaggt gtacacactg cccccaagca gggacgagct gaccaagaac	1080
cagggtgtccc tgacctgtct cgtgaaaggc ttctaccctt ccgatatcgc cgtggatgg	1140
gagagcaacg gccagccgaa gaacaactac aagaccaccc cccctgtgct ggacagcgcac	1200
ggctcattct tcctgtacag caagctgacc gtggacaagt cccggtgcc gcaaggcaac	1260
gtgttcagct gcagcgtgat gcacgaggcc ctgcacaacc actacacccca gaagtccctg	1320
agcctgagcc ctggc	1335

<210> SEQ ID NO 100

<211> LENGTH: 648

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 100

cagtctgttc tgacacagcc tcctagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgttagcg gcagcagctc caacatcgcc aacaacgacg tgcctggta tcagcagctg	120
cctggcacag cccctaaact gctgatctac gccgacagcc acagacctag cggcgtgcca	180
gatagattca gcccgtctaa gagccgcaca tctgccagcc tggccatctc tggactgaga	240
tctgaggacg aggccgacta ctattgcggc gcctggatt ctgcctgag cggctatgtt	300
tttggcggag gcaccaagct gacccgtcta ggccagccata aagccgcccc tagegtgacc	360
ctgttccctc caagcagcga ggaactgcag gccaacaagg ccaccctgt gtgcctgatc	420
agcgacttct atcctggcgc cgtgaccgt gcctggaaagg ccgatagctc tcctgtaaag	480
gccggcgtgg aaaccaccac ccctagcaag cagagcaaca acaaatacgc cgccagcgc	540
tacctgagcc tgaccccccga gcagtggaaag tcccacagat cctacagctg ccaagtgacc	600
cacgaggggca gcacccgtgga aaagacagtg gcccctaccg agtgcagc	648

<210> SEQ ID NO 101

<211> LENGTH: 123

-continued

<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 101

```

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1           5           10           15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20          25           30

Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35          40           45

Ser Gly Ile Ser Trp Asn Ser Gly Ser Ile Gly Tyr Ala Asp Ser Val
50          55           60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85          90           95

Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100         105          110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115         120

```

<210> SEQ ID NO 102
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 102

```

Ser Tyr Glu Met Asn
1           5

```

<210> SEQ ID NO 103
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 103

```

Gly Ile Ser Trp Asn Ser Gly Ser Ile Gly Tyr Ala Asp Ser Val Lys
1           5           10           15

Gly

```

<210> SEQ ID NO 104
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 104

```

Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
1           5           10

```

<210> SEQ ID NO 105
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 105

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1					5				10				15		

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly
					20			25			30				

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
					35			40		45					

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
				50		55			60						

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Thr	Gly	Leu
				65		70		75			80				

Gln	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ser	Ser	Tyr	Ala	Gly	Ser
				85		90			95						

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu		
				100		105			110						

<210> SEQ ID NO 106

<211> LENGTH: 14

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 106

Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly	Tyr	Asp	Val	His		
1					5			10							

<210> SEQ ID NO 107

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 107

Gly	Asn	Ser	Asn	Arg	Pro	Ser									
1				5											

<210> SEQ ID NO 108

<211> LENGTH: 11

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 108

Ser	Ser	Tyr	Ala	Gly	Ser	Asn	Pro	Tyr	Val	Val					
1					5			10							

<210> SEQ ID NO 109

<211> LENGTH: 369

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 109

gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcggtc tctgagactg 60

agctgtgcgg ccagcggtt caccttagc agctacgaga tgaactgggt ccgacaggcc 120

cctggcaaag gccttgaatg ggtgtccggc atcagctgga atagcggctc tatcggtac 180

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gccgacagcg tgaaggccag attcaccatc agccggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcggtg actactgtgc cagaaggccc	300
tacagcagct cttggttga ccccgactt c gactattggg gccagggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 110
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 110

agctacgaga tgaac	15
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<210> SEQ ID NO 111
<211> LENGTH: 51
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 111

ggcatcagct ggaatagccg ctctatccgc tacggccaca gcgtgaaggg c	51
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<210> SEQ ID NO 112
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 112

agcggctaca gcagctttt gtttgacccc gacttcgact at	42
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<210> SEQ ID NO 113
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 113

cagtctgttc tgacacagcc tccatctgtc tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc caatatcgga gcccgtatg acgtgcactg gtatcagcag	120
ctgcctggca cagccccata actgtgtatc tacggcaaca gcaacagacc cagcggcgtg	180
cccgatagat ttccggctc taagacggc acaagcgcca gctggctat tactggactg	240
caggccgagg acgaggccga ctactactgt tctagctacg cggcagcaa cccctacgtg	300
gtgtttggcg gaggcaccaa gctgacagtt cta	333

<210> SEQ ID NO 114
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 114

acaggcagca gctccaatat cgagccggc tatgacgtgc ac	42
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<210> SEQ ID NO 115
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 115

ggcaacagca acagaccagg c

21

<210> SEQ ID NO 116
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 116

tcttagctacg ccggcagcaa cccctacgtg gtg

33

<210> SEQ ID NO 117
<211> LENGTH: 452
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 117

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45Ser Gly Ile Ser Trp Asn Ser Gly Ser Ile Gly Tyr Ala Asp Ser Val
50 55 60Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100 105 110Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr

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245	250	255
Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val		
260	265	270
Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val		
275	280	285
Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser		
290	295	300
Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu		
305	310	315
Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala		
325	330	335
Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro		
340	345	350
Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln		
355	360	365
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala		
370	375	380
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr		
385	390	395
Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu		
405	410	415
Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser		
420	425	430
Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser		
435	440	445
Leu Ser Pro Gly		
450		

<210> SEQ ID NO 118
<211> LENGTH: 217
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 118

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln		
1	5	10
15		
Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly		
20	25	30
Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu		
35	40	45
Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe		
50	55	60
Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu		
65	70	75
80		
Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr Ala Gly Ser		
85	90	95
Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly		
100	105	110
Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu		
115	120	125
Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe		
130	135	140
Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val		

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145	150	155	160
Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys			
165	170	175	
Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser			
180	185	190	
His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu			
195	200	205	
Lys Thr Val Ala Pro Thr Glu Cys Ser			
210	215		

<210> SEQ ID NO 119

<211> LENGTH: 1356

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 119

gaagttcagc tgctgaaatc tggcgccgga ctggttcaac ctggcggttc tctgagactg	60
agctgtgcgg ccagcggctt cacctttagc agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccggc atcagctgga atagcggctc tatcggtac	180
gccgacagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcgtgt actactgtgc cagaaggcgc	300
tacagcagct cttggtttgc ccccgacttc gactattggg gccaggcac actggtcaca	360
gtctcttcag ccagcaccaa gggccccago gtgttccctc tggcccccctag cagcaagagc	420
acatctggcg gaacagccgc cctgggctgc ctcgtgaagg actacttcc cgagccctgt	480
accgtgtctt ggaactctgg cgctctgaca agcggcgtgc acaccttcc agccgtgtc	540
cagagcagcg gcctgtactc tctgagcago gtcgtgacag tgcccagcag ctctctggc	600
acccagacct acatctgca a cgtgaaccac aaggccagca acaccaaggt ggacaagaag	660
gtggaaccca agagctgcga caagacccac acctgtcccc cttgtctgc ccccgaaactg	720
ctggggaggcc cttccgtgtt cctgttcccc ccaaagccca aggacaccct gatgtcagc	780
cgggaccccg aagtgacctg cgtgggttgt gatgtgtccc acgaggaccc tgaagtgaag	840
ttcaatttgtt acgtggacgg cgtgaaatgt cacaacgcca agaccaagcc tagagaggaa	900
cagtacaaca gcacccatccg ggtgggtgtcc gtgtgacag tgctgcacca ggactggctg	960
aacggcaaaag agtacaatgt caagggtgtcc aacaaggcccc tgcctgcctt catcgagaaa	1020
accatcagca aggccaagggg ccagccccgc gaacccagg tgtacacact gcccccaagc	1080
agggacgacgc tgaccaagaa ccagggtgtcc ctgacccgttc tctgtgaaagg cttctacccc	1140
tccgatatacg ccgtgaaatg ggagagcaac ggccagcccc agaacaacta caagaccacc	1200
ccccctgtgc tggacagcga cggctcatc ttctgtaca gcaagctgac cgtggacaag	1260
tcccggtggc agcaggggcaa cgtgttcago tgcagcgtga tgcacgaggc cctgcacaa	1320
cactacaccc agaagtcctt gagcctgago cctggc	1356

<210> SEQ ID NO 120

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 120

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cagtctgttc tgacacagcc tccatctgtc tctggcgccc ctggacagag agtgaccatc      60
agctgtacag gcagcagctc caaatcgga gccggctatg acgtgcactg gtatcagcag      120
ctgcctggca cagccccata actgtgtatc tacggcaaca gcaacagacc cagcggctg      180
cccgatagat ttccggctc taagagcgcc acaagcgcca gcctggctat tactggactg      240
caggccgagg acgaggccga ctactactgt tctagctacg ccggcagcaa cccctacgt      300
gtgtttggcg gaggcacaa gctgacagtt cttagccagc ctaaagccgc ccctagcgt      360
acctgttcc ctccaagcag cgaggaactg cagggcaaca aggccacct cgtgtgcctg      420
atcagcgact tctatcctgg cgccgtgacc gtggcctgga aggccgatag ctctcctgt      480
aaggccggcg tggaaaccac cacccctagc aagcagagca acaacaata cgccgcccagc      540
agctacactga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagt      600
acccacgagg gcagcaccgt ggaaaagaca gtggccccta ccgagtgcag c      651
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<210> SEQ ID NO 121

<211> LENGTH: 120

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 121

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Ley	Val	Gln	Pro	Gly	Gly
1														

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr

Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Ley	Glu	Trp	Val
35															

Ser	Ala	Ile	Gly	Thr	Gly	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Lys
50															

Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Ley	Tyr	Ley
65															

Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	Ala
85															

Arg	Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Tyr	Trp	Gly	Gln
100															

Gly	Thr	Leu	Val	Thr	Val	Ser	Ser								
115															

<210> SEQ ID NO 122

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 122

Ser	Tyr	Ala	Met	Ser											
1															

<210> SEQ ID NO 123

<211> LENGTH: 16

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 123

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Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
 1 5 10 15

<210> SEQ ID NO 124
 <211> LENGTH: 12
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 124

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
 1 5 10

<210> SEQ ID NO 125
 <211> LENGTH: 111
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 125

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
 20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
 35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
 50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
 65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
 85 90 95

Asn Gly Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
 100 105 110

<210> SEQ ID NO 126
 <211> LENGTH: 13
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 126

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
 1 5 10

<210> SEQ ID NO 127
 <211> LENGTH: 7
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 127

Tyr Asp Asp Leu Arg Pro Ser
 1 5

<210> SEQ ID NO 128
 <211> LENGTH: 12
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence

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<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 128

Ala Ala Trp Asp Asp Ser Leu Asn Gly Tyr Val Val		
1	5	10

<210> SEQ ID NO 129
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 129

gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgc ccageggctt caccttago agctacgcca tgagctgggt ccgacaggt	120
cctggcaaag gccttgaatg ggtgtccgca attggcacag gcggcgatac ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
catatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggggca cactggtcac cgtttcttca	360

<210> SEQ ID NO 130
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 130

agctacgcca tgagc	15
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<210> SEQ ID NO 131
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 131

gccattggca caggcgccga tacctactac gccgactctg tgaagggc	48
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<210> SEQ ID NO 132
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 132

agggacgact acaccaggcag ggacgccttc gattat	36
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<210> SEQ ID NO 133
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 133

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgttagcg gcagcagctc caacatggc agcaacaccc tgaactggta tcagcagctg	120

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cctggcacag cccctaaact gctgatctac tacgacgacc tgcggcttag cgccgtgcc	180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag	240
agcgaggacg aggccgacta ttatttgcc gcctggacg acagcctgaa cggctatgtt	300
gttttcggcg gaggcaccaa gctgaccgtt cta	333

<210> SEQ ID NO 134
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 134

agcggcagca gctccaacat cggcagcaac accgtgaac	39
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<210> SEQ ID NO 135
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 135

tacgacgacc tgccggctag c	21
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<210> SEQ ID NO 136
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 136

ggccgcctggg acgacagcct gaacggctat gttgtt	36
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<210> SEQ ID NO 137
<211> LENGTH: 449
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 137

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly			
1	5	10	15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr		
20	25	30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val		
35	40	45

Ser Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys		
50	55	60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala		
85	90	95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln		
100	105	110

Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val		
115	120	125

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Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala
130 135 140

Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
145 150 155 160

Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
165 170 175

Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
180 185 190

Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys
195 200 205

Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp
210 215 220

Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly
225 230 235 240

Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile
245 250 255

Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu
260 265 270

Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His
275 280 285

Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg
290 295 300

Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys
305 310 315 320

Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu
325 330 335

Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr
340 345 350

Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu
355 360 365

Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp
370 375 380

Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val
385 390 395 400

Leu Asp Ser Asp Gly Ser Phe Leu Tyr Ser Lys Leu Thr Val Asp
405 410 415

Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His
420 425 430

Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro
435 440 445

Gly

<210> SEQ ID NO 138
<211> LENGTH: 217
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 138

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu

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35	40	45
Ile	Tyr	Tyr
Asp	Asp	Asp
Leu	Arg	Pro
Pro	Ser	Gly
Gly	Val	Pro
Asp	Arg	Asp
Arg	Phe	Ser
50	55	60
Gly	Ser	Lys
Ser	Gly	Thr
Ala	Ser	Leu
Ala	Ile	Ser
Ile	Ser	Gly
Leu	Gln	
65	70	75
80		
Ser	Glu	Asp
Glu	Ala	Asp
Tyr	Tyr	Cys
85	90	95
Ala	Ala	Trp
Asp	Asp	Ser
Leu		
Asn	Gly	Tyr
Tyr	Val	Val
Phe	Gly	Gly
Gly	Thr	Lys
Leu	Thr	Val
Leu	Gly	
100	105	110
Gln	Pro	Lys
Ala	Ala	Pro
Pro	Ser	Val
Val	Thr	Leu
Phe	Pro	Pro
Pro	Ser	Ser
Glu		
115	120	125
Glu	Leu	Gln
Ala	Asn	Lys
Asn	Ala	Thr
Leu	Val	Cys
Leu	Ile	Ser
Ile	Ser	Asp
Phe		
130	135	140
Tyr	Pro	Gly
Gly	Ala	Val
Ala	Val	Thr
Thr	Val	Ala
Trp	Lys	Asp
145	150	155
Asp	Ser	Ser
Ser	Pro	Val
160		
Lys	Ala	Gly
Gly	Val	Glu
Thr	Thr	Thr
Pro	Ser	Lys
165	170	175
Tyr	Ala	Ala
Ala	Ser	Ser
Tyr	Leu	Ser
Leu	Thr	Pro
Thr	Glu	Gln
Gln	Trp	Trp
Trp	Lys	Ser
180	185	190
His	Arg	Ser
Tyr	Ser	Cys
Cys	Gln	Val
Gln	Thr	His
Val	Glu	Gly
Thr	Ser	Ser
His	Thr	Val
195	200	205
Lys	Thr	Val
Val	Ala	Pro
Ala	Pro	Thr
Pro	Glu	Cys
210	215	

<210> SEQ ID NO 139
<211> LENGTH: 1347
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 139

gaagttcagc	tgctgaaatc	tggcgccgga	ctgggtcaac	ctggcgatc	tctgagactg	60
agctgtgcgg	ccaggcggtt	cacctttago	agctacgcca	ttagctgggt	ccgacaggct	120
cctggcaaag	gccttgaatg	ggtgtccgccc	attggcacag	gcggcgatac	ctactacgcc	180
gactctgtga	agggcagatt	caccatcago	cgggacaaca	gcaagaacac	cctgtactg	240
cagatgaaca	gcctgagagc	cgaggacacc	gccgtgtact	attgcgccag	aaggacgac	300
tacaccagca	gggacgcctt	cgattattgg	ggccagggca	cactggtcac	cgtttctca	360
gccagcacca	agggccccag	cgtgttccct	ctggccctta	gcagcaagag	cacatctggc	420
ggaacagccg	ccctggggctg	cctcgtgaag	gactacttc	ccgagccctgt	gaccgtgtcc	480
tggaactctg	gcgcctctgac	aagcgccgtg	cacaccttc	cagccgtgt	gcagagcagc	540
ggcctgtact	ctctgagcag	cgtcgctgaca	gtgcccagca	gctctctggg	cacccagacc	600
tacatctgca	acgtgaacca	caagcccago	aacaccaagg	tggacaagaa	ggtggAACCC	660
aagagctgcg	acaagaccca	cacctgtccc	ccttgccttg	cccccgaaact	gctggagggc	720
ccttccgtgt	tcttgttccc	ccccaaagccc	aaggacaccc	tgtatgtatcg	ccggacccccc	780
gaagtgcacct	gcgtgggtgt	ggatgtgtcc	cacgaggacc	ctgaagtgaa	gttcaatgg	840
tacgtggacg	gcgtggaaat	gcacaacgcc	aagaccaagc	ctagagagga	acagtacaac	900
agcacacctacc	gggtgggtgtc	cgtcgctgaca	gtgctgcacc	aggactggct	gaacggccaaa	960
gagtacaagt	gcaagggtgtc	caacaaggcc	ctgcctgccc	ccatcgagaa	aaccatcagc	1020

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aaggccaagg	gccagccccg	cgaacccag	gtgtacacac	tgccccaag	cagggacag	1080
ctgaccaaga	accagggtgc	cctgacctgt	ctcgtaaaag	gcttctaccc	ctccgatatc	1140
gccgtgaaat	gggagagcaa	cggccagccc	gagaacaact	acaagaccac	ccccctgtg	1200
ctggacagcg	acggctcatt	cttctgtac	agcaagctga	ccgtggacaa	gtcccggtgg	1260
cacgaggcga	acgtgttcag	ctgcagcgtg	atgcacgagg	ccctgcacaa	ccactacacc	1320
cagaagtccc	tgagcctgag	ccctggc				1347

<210> SEQ ID NO 140
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 140

cagtctgttc	tgacacagcc	tccttagcgcc	tctggcacac	ctggacagag	agtgaccatc	60
agctgtacgc	gcagcagctc	caacatcgcc	agcaacaccc	tgaactggta	tcagcagctg	120
cctggcacag	cccctaaact	gctgatctac	tacgacgacc	tgcggcttag	cggcgtgcca	180
gatagatttt	ctggcagcaa	gagcggcacc	tctgcccggcc	tggctatttc	tggactgcag	240
agcgaggacg	aggccgacta	ttatttgtcc	gcctgggacg	acagcctgaa	cggctatgtt	300
gttttcggcg	gaggccacca	gctgaccgtt	ctaggccagc	ctaaagccgc	ccctagcgtg	360
accctgttcc	ctccaaagcag	cgaggaactg	caggccaaaca	aggccaccc	cgtgtgcctg	420
atcagcgtact	tctatccctgg	cgccgtgacc	gtggcctgg	aggccgatag	ctctccctgtg	480
aaggccggcg	tggaaaccac	cacccttagc	aagcagagca	acaacaata	cggccgcagc	540
agctacactga	gcctgacccc	cgagcgtgg	aagtcccaca	gatcctacag	ctgccaagtg	600
acccacgagg	gcagcaccgt	ggaaaagaca	gtggccctta	ccgagtgcag	c	651

<210> SEQ ID NO 141
<211> LENGTH: 120
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 141

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1							5			10			15		
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Tyr	Ser	Tyr
										20	25		30		
Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
										35	40		45		
Ser	Ala	Ile	Gly	Thr	Gly	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Lys
										50	55		60		
Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr	Leu
										65	70		75		80
Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	Ala
										85	90		95		
Arg	Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Tyr	Trp	Gly	Gln
										100	105		110		
Gly	Thr	Leu	Val	Thr	Val	Ser	Ser								
										115	120				

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<210> SEQ ID NO 142
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 142

Ser Tyr Ala Met Ser
1 5

<210> SEQ ID NO 143
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 143

Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> SEQ ID NO 144
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 144

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
1 5 10

<210> SEQ ID NO 145
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 145

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
85 90 95

Asn Asp Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> SEQ ID NO 146
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 146

-continued

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
 1 5 10

<210> SEQ ID NO 147
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 147

Tyr Asp Asp Leu Arg Pro Ser
 1 5

<210> SEQ ID NO 148
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 148

Ala Ala Trp Asp Asp Ser Leu Asn Asp Tyr Val Val
 1 5 10

<210> SEQ ID NO 149
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 149

gaagttcagc tgcttgaatc tggcgccgga ctgggtcaac ctggcggtac tctgagactg	60
agctgtgcgc ccagcggctt cacctttac agtacgcaca tgagctgggt ccgacaggcc	120
ccttgaaaag gccttgaatg ggtgtccgcc atcggcacag gcccgcatac ctactatgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
catatgaaca gccttagagc cgaggacacc gccgtgtact attgcgccag aaggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggcga cactggtcac cgtttctca	360

<210> SEQ ID NO 150
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 150

agtttacgcgc tgagc	15
-------------------	----

<210> SEQ ID NO 151
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 151

ggccatcgccca caggcgccga tacctactat gccgactctg tgaaggc	48
---	----

<210> SEQ ID NO 152
<211> LENGTH: 36
<212> TYPE: DNA

-continued

<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 152

```
agggacgact acaccagcag ggacgccttc gattat
```

36

<210> SEQ ID NO 153
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 153

```
cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc
agctgttagcg gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg
cctggcacag cccctaaact gctgatctac tacgacgacc tgcggcttag cgccgtgcca
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag
agcggaggacg aggccgacta ttattgtgcc gcctgggacg acagcctgaa cgactacgtt
gtgtttggcg gaggcaccaa gctgaccgtt cta
```

333

<210> SEQ ID NO 154
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 154

```
agcggcagca gctccaacat cggcagcaac accgtgaac
```

39

<210> SEQ ID NO 155
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 155

```
tacgacgacc tgcggcttag c
```

21

<210> SEQ ID NO 156
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 156

```
gccccctggg acgacagcct gaacgactac gtttgt
```

36

<210> SEQ ID NO 157
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 157

```
Glu Val Gln Leu Leu Glu Ser Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15
```

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Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr
 20 25 30
 Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45
 Ser Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
 50 55 60
 Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
 65 70 75 80
 Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
 85 90 95
 Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
 100 105 110
 Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
 115 120 125
 Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
 130 135 140
 Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
 145 150 155 160
 Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
 165 170 175
 Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
 180 185 190
 Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys
 195 200 205
 Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro
 210 215 220
 Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val
 225 230 235 240
 Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
 245 250 255
 Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu
 260 265 270
 Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
 275 280 285
 Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
 290 295 300
 Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
 305 310 315 320
 Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile
 325 330 335
 Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
 340 345 350
 Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
 355 360 365
 Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
 370 375 380
 Gly Gln Pro Glu Asn Asn Tyr Lys Thr Pro Pro Val Leu Asp Ser
 385 390 395 400
 Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg
 405 410 415
 Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
 420 425 430
 His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys

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435

440

445

<210> SEQ ID NO 158
<211> LENGTH: 217
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 158

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1				5					10				15		
Arg	Val	Thr	Ile	Ser	Cys	Ser	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn
	20					25						30			
Thr	Val	Asn	Trp	Tyr	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu	Leu	
	35					40			45						
Ile	Tyr	Tyr	Asp	Asp	Leu	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser
	50					55			60						
Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu	Gln
	65					70			75				80		
Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ala	Ala	Trp	Asp	Asp	Ser	Leu
	85					90			95						
Asn	Asp	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly	
	100					105			110						
Gln	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	Glu
	115					120			125						
Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	Phe
	130					135			140						
Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	Val
	145					150			155				160		
Lys	Ala	Gly	Val	Glu	Thr	Thr	Pro	Ser	Lys	Gln	Ser	Asn	Asn	Lys	
	165					170			175						
Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	Ser
	180					185			190						
His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	Glu
	195					200			205						
Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser							
	210					215									

<210> SEQ ID NO 159
<211> LENGTH: 1341
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 159

gaagttcagc	tgctgaaatc	tggcgccgga	ctgggttcaac	ctggcggttc	tctgagactg	60
agctgtgcgg	ccagcggctt	cacctttac	agctacgcca	ttagctgggt	ccgacaggcc	120
cctggaaaag	gccttgaatg	ggtgtccgcc	atccggcacag	gcggcgatac	ctactatgcc	180
gactctgtga	agggcagatt	caccatcago	cgggacaaca	gcaagaacac	cctgtacctg	240
cagatgaaca	gcctgagagc	cgaggacacc	gccgtgtact	attgcgccag	aaggacgac	300
tacaccagca	gggacgcctt	cgattattgg	ggccaggccca	cactggtac	cgtttctca	360
gccagcacca	agggccccag	cgtgttccct	ctggcccctt	gtagcagaag	caccagcgag	420
tctacagccg	ccctgggctg	cctcgtgaag	gactacttcc	ccgagccctgt	gaccgtgtcc	480

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tggaactctg ggcgtctgac aagcggcgta cacacccccc cagccgtgct gcagagcagc 540
 ggccctgtact ctctgagcag cgctcgatca gtgcggcaga gcagccctggg caccaggacc 600
 tacacccgtta acgtggacca caagccccaa aacaccaagg tggacaagcg ggtggaatct 660
 aagtacggcc ctccctgccc tccttgcaca gcccctgaat ttctggccgg accctccgt 720
 ttccctgttcc ccccaaagcc caaggacacc ctgatgatca gccggacccc cgaagtgacc 780
 tgctgttgtgg tggatgtgtc ccagggaaat cccgagggtgc agttcaattt gtacgtggac 840
 ggctgtggaaat tgccacaacgc caagaccaag cccagagagg aacagttcaa cagcacctac 900
 cgggtgttgtt cccgtgtgac agtgcgtgcac caggactggc tgaacggcaa agagtacaag 960
 tgcaagggtgtt ccaacaagggg cctgcccaga tccatcgaga aaaccatcag caaggccaa 1020
 ggccagcccccc gcaaaaaaaa ggtgtacaca ctgcctccaa gccaggaaaga gatgaccaag 1080
 aaccagggtgtt ccctgacccctg tctcgtaaaa ggcttctacc cctccgatata cgccgtggaa 1140
 tgggagggca acggccagcc cgagaacaaac tacaagacca cccccccctgt gctggacagc 1200
 gacggctcat ttttcctgtta cagcagactg accgtggaca agagccggtg gcagggaa 1260
 aacgtgttca gtcgcagcgt gatgcacgg gcccctgcaca accactacac ccagaagtcc 1320
 ctgtctctga gcttggccaa g 1341

<210> SEQ ID NO 160
 <211> LENGTH: 651
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 160

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtggaccatc 60
 agctgttagcg gcagcagcgtc caacatcgcc agcaacaccc tgaactggta tcagcagctg 120
 cctggccacag cccctaaact gctgatctac taagacgacc tgccggcttag cggcggtcca 180
 gatagatttt ctggcagcaa gageggcacc tctgccagcc tggctatttc tggactgcag 240
 agcgaggacg aggccgacta ttattgtgcc gcctgggacg acagcctgaa cgactacgtt 300
 gtgtttggcg gaggccacaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgtg 360
 accctgttcc ctccaaagcag cgaggaactg caggccaaaca aggccaccct cgtgtgcctg 420
 atcagcgtact tctatccctgg cggccgtgacc gtggccctggaa aggccgatag ctctccctgt 480
 aaggccggcg tggaaaccac cacccttagc aagcagagca acaacaaata cggccgcagc 540
 agctacctga gcttggccccc cgagcgtgg aagtcccaca gatcctacag ctgccaagtg 600
 accccacggg gcagcaccgt ggaaaagaca gtggccctta ccgagtgccag c 651

<210> SEQ ID NO 161
 <211> LENGTH: 120
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 161

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1															
							10							15	
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
							20							30	

-continued

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45

Ser Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
 50 55 60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
 85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
 100 105 110

Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> SEQ ID NO 162

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 162

Ser Tyr Ala Met Ser

1 5

<210> SEQ ID NO 163

<211> LENGTH: 16

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 163

Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
 1 5 10 15

<210> SEQ ID NO 164

<211> LENGTH: 12

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 164

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
 1 5 10

<210> SEQ ID NO 165

<211> LENGTH: 111

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 165

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
 20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
 35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
 50 55 60

-continued

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
85 90 95

Asn Asp Ile Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> SEQ ID NO 166

<211> LENGTH: 13

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 166

Ser Gly Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
1 5 10

<210> SEQ ID NO 167

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 167

Tyr Asp Asp Leu Arg Pro Ser
1 5

<210> SEQ ID NO 168

<211> LENGTH: 12

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 168

Ala Ala Trp Asp Asp Ser Leu Asn Asp Ile Val Val
1 5 10

<210> SEQ ID NO 169

<211> LENGTH: 360

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 169

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt caccttagc agctacgcca tgagctgggt ccgacaggt	120
cctggcaaag gccttgaatg ggtgtccgca atcggctatg gggcgatac ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggcacgac	300
tacaccagca gggacgcctt cgattattgg ggccagggca cactggtcac cgtttcttca	360

<210> SEQ ID NO 170

<211> LENGTH: 15

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 170

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agctacgcca tgagc	15
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<210> SEQ ID NO 171
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 171

ggccatcggt atggcgccga tacctactac gcccactctg tgaaggc	48
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<210> SEQ ID NO 172
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 172

agggacgact acaccagcag ggacgccttc gattat	36
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<210> SEQ ID NO 173
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 173

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgtacgc gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg	120
cctggcacag cccctaaact gctgatctac tacgacgacc tgccgcctag cggcgtgcca	180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag	240
agcgaggacg aggccgacta ttattgtgcc gcctgggacg acagcctgaa cgacatcgtt	300
gttttcggcg gaggcaccaa gctgaccgtt cta	333

<210> SEQ ID NO 174
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 174

agcggcagca gctccaacat cggcagcaac accgtgaac	39
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<210> SEQ ID NO 175
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 175

tacgacgacc tgccgcctag c	21
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<210> SEQ ID NO 176
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:

-continued

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 176

ggccgcctggg acgacagcct gaacgacatc gttgtt

36

<210> SEQ ID NO 177

<211> LENGTH: 447

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 177

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45Ser Ala Ile Gly Tyr Gly Asp Thr Tyr Ala Asp Ser Val Lys
50 55 60Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
65 70 75 80Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
115 120 125Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
130 135 140Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
145 150 155 160Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
165 170 175Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
180 185 190Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys
195 200 205Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro
210 215 220Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val
225 230 235 240Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
245 250 255Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu
260 265 270Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
275 280 285Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
290 295 300Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
305 310 315 320Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile
325 330 335

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Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
340 345 350

Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
355 360 365

Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
370 375 380

Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser
385 390 395 400

Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg
405 410 415

Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
420 425 430

His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
435 440 445

<210> SEQ ID NO 178

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 178

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
85 90 95

Asn Asp Ile Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105 110

Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
115 120 125

Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
130 135 140

Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
145 150 155 160

Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
165 170 175

Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
180 185 190

His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
195 200 205

Lys Thr Val Ala Pro Thr Glu Cys Ser
210 215

<210> SEQ ID NO 179

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

-continued

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 179

gaagttcagc tgcttgaatc tggggcgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt cacctttagc agctacgcca ttagctgggt ccgacaggct	120
cctggcaag gccttgaatg ggtgtccgc atcggctatg gggcgatc ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacgt	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgcag aaggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggcga cactggtcac cggttctca	360
gccagcacca agggccccag cgtgttccct ctggccctt ttagcagaag caccagcgag	420
tctacagccg ccctgggctg cctcgtaag gactacttc ccgagccctg gaccgtgtcc	480
tggaaactctg ggcgtctgac aagcggcgtg cacacccccc cagccgtgt gcagagcagc	540
ggcctgtact ctctgagcag cgctcgata gtgcccagca gcagcctggg caccaagacc	600
tacacctgtat acgtggacca caagcccgaa aacaccaagg tggacaagcg ggtggatct	660
aagtacggcc ctccctgccc tccttgccca gcccctgaat ttctggccgg accctccgtg	720
ttccctgtcc ccccaaagcc caaggacacc ctgatgtaca gccggacccc cgaagtgacc	780
tgcgtgggtt tggatgtgtc ccaggaagat cccgaggtgc agttcaattt gtacgtggac	840
ggcgtggaaag tgcacaacgc caagaccaag cccagagagg aacagtccaa cagcacctac	900
cgggtgggtt ccgtgtgtc agtgcgtgcac caggactggc tgaacggcaa agagtacaag	960
tgcaagggtt ccaacaaggg cctgcccgg tccatcgaga aaaccatcag caaggccaa	1020
ggccagccccc gcgaacccca ggtgtacaca ctgcctccaa gccaggaaga gatgaccaag	1080
aaccagggtt ccctgacctg tctcgtaaa ggcttctacc cctccgatat cgccgtggaa	1140
tgggagagca acggccagcc cgagaacaac tacaagacca ccccccctgt gctggacagc	1200
gacggctcat ttttctgtat cagcagactg accgtggaca agagccgggt gcaaggagc	1260
aacgtgttca gctgcagcgt gatgcacgag gccctgcaca accactacac ccagaagtcc	1320
ctgtctgtat gcctggccaa g	1341

<210> SEQ ID NO 180

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 180

cagtctgttc tgacacagcc tcctagcgcc tctggcacac ctggacagag agtgcaccatc	60
agctgttagcg gcagcagctc caacatcgcc agcaacaccg tgaactggta tcagcagctg	120
cctggcacag ccccttaact gctgtatctac tacgacgacc tggcgccatcg ccgctgtccca	180
gatagattt ctggcagcaa gagcggcacc tctggcagcc tggctatttc tggactgcag	240
agcgaggacg aggccgacta ttattgtggcc gcctgggacg acagcctgaa cgacatcggt	300
gttttcggcg gaggcaccaa gctgaccgtt ctggccagcc ctaaagccgc ccctagcgtg	360
accctgttcc ctccaaagcag cgaggaactg caggccaaaca aggccaccct cgtgtgcctg	420
atcagcgtact tctatctgg cgccgtgacc gtggccctggaa aggccatag ctctctgt	480
aaggccggcg tggaaaaccac cacccttagc aagcagagca acaacaata cgccgcacg	540
agctacactgtat gcctggccaa cgagcgtgg aagtcccaca gatcctacag ctgccaatg	600

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acccacgagg gcagcaccgt ggaaaagaca gtggccctca ccgagtgcag c 651

<210> SEQ ID NO 181

<211> LENGTH: 120

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 181

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
50 55 60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110

Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> SEQ ID NO 182

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 182

Ser Tyr Ala Met Ser
1 5

<210> SEQ ID NO 183

<211> LENGTH: 16

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 183

Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> SEQ ID NO 184

<211> LENGTH: 12

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 184

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
1 5 10

<210> SEQ ID NO 185

<211> LENGTH: 111

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<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 185

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1															
						5						10			15

Arg	Val	Thr	Ile	Ser	Cys	Ser	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn
							20					25			30

Thr	Val	Asn	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu	Leu
							35				40		45		

Ile	Tyr	Tyr	Asp	Asp	Leu	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser
						50				55		60			

Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu	Gln
						65			70		75		80		

Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ala	Ala	Trp	Asp	Asp	Ser	Leu
						85			90		95				

Asn	Val	Tyr	Pro	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu		
						100			105		110				

<210> SEQ ID NO 186

<211> LENGTH: 13

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 186

Ser	Gly	Ser	Ser	Asn	Ile	Gly	Ser	Asn	Thr	Val	Asn
1											
						5				10	

<210> SEQ ID NO 187

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 187

Tyr	Asp	Asp	Leu	Arg	Pro	Ser
1						
				5		

<210> SEQ ID NO 188

<211> LENGTH: 12

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 188

Ala	Ala	Trp	Asp	Asp	Ser	Leu	Asn	Val	Tyr	Pro	Val
1											
						5			10		

<210> SEQ ID NO 189

<211> LENGTH: 360

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 189

gaagttcagc tgctgaaatc tggcgccgga ctgggttcaac ctggcgatc tctgagactg 60

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agctgtgcggccg ccagcggctt caccttagc agctacgcca tgagctgggt ccgacaggct	120
cctggcaaa ggcattttatg ggtgtccggcc atcggttatg gggcgatacc ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcgttgagac cgaggacacc gccgtgtact attgcgccc aagggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggggca cactggtcac cgtttctca	360

<210> SEQ ID NO 190
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 190

agctacgcca tgagc	15
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<210> SEQ ID NO 191
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 191

gccatcggt atggcgccga tacctactac gccgactctg tgaaggc	48
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<210> SEQ ID NO 192
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 192

aggcacgact acaccagcag ggacgccttc gattat	36
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<210> SEQ ID NO 193
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 193

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtggaccatc	60
agctgttagcg gcagcagctc caacatcgcc agcaacaccg tgaactggta tcagcagctg	120
cctggcacag ccccttaact gctgtatctac tacgacgacc tgccgcttag cggcgccca	180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag	240
aggcaggacg aggccgacta ttattgtgcc gcctggacg acagcctgaa cgtgtaccct	300
gtttttggcg gaggcaccaa gctgaccgtt cta	333

<210> SEQ ID NO 194
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 194

agcggcagca gtcacatcgcc accgtgaac	39
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<210> SEQ ID NO 195
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 195

tacgacgacc tgccggcttag c

21

<210> SEQ ID NO 196
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 196

ggccgcctggg acgacagcct gaacgtgtac cctgtt

36

<210> SEQ ID NO 197
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 197

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45Ser Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
50 55 60Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
65 70 75 80Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
115 120 125Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
130 135 140Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
145 150 155 160Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
165 170 175Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
180 185 190Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys
195 200 205Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro
210 215 220Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val
225 230 235 240

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Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
245 250 255

Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu
260 265 270

Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
275 280 285

Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
290 295 300

Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
305 310 315 320

Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile
325 330 335

Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
340 345 350

Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
355 360 365

Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
370 375 380

Gly Gln Pro Glu Asn Asn Tyr Lys Thr Pro Pro Val Leu Asp Ser
385 390 395 400

Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg
405 410 415

Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
420 425 430

His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
435 440 445

<210> SEQ ID NO 198

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 198

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
85 90 95

Asn Val Tyr Pro Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105 110

Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
115 120 125

Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
130 135 140

Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
145 150 155 160

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Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
165 170 175

Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
180 185 190

His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
195 200 205

Lys Thr Val Ala Pro Thr Glu Cys Ser
210 215

<210> SEQ ID NO 199

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 199

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg 60
 agctgtgcgg ccagcggctt caccttagc agctacgcca tgagctgggt ccgacaggct 120
 cctggcaaag gccttgaatg ggtgtccgco atcggctatg gggcgatac ctactacgcc 180
 gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac octgtacctg 240
 cagatgaaca gcctgagagc cgaggacacc gcctgtact attgcgcocag aagggacgac 300
 tacaccagca gggacgcctt cgattattgg ggccagggca cactggcac cgtttcttca 360
 gcccacca gggcccccaag cgtgtccct ctggccctt ttagcagaag caccagcgag 420
 tctacagccg ccctgggctg ccttgtaaag gactacttc ccgagccctgt gaccgtgtcc 480
 tggaaactctg ggcgtctgac aagcggcggtg cacacccctt cagccgtgt gcagagcagc 540
 ggccctgtact ctctgagcag cgttgtgaca gtgcggcagca gcagcctggg caccaagacc 600
 tacacctgtta acgtggacca caagccacg aacaccaagg tggacaagcg ggtggaatct 660
 aagtacggcc ctccctgccc tccttgccca gcccctgaat ttctggccgg accctccgtg 720
 ttccctgtcc ccccaaagcc caaggacacc ctgatgtatc gccggacccc cgaagtgacc 780
 tgcgtgggtgg tggatgtgtc ccaggaagat cccgagggtgc agttcaattt gtacgtggac 840
 ggcgtggaaag tgcacaacgc caagaccaag cccagagagg aacagttcaa cagcaccc 900
 cgggtgggtgt ccgtgtgtc agtgcgtcac caggactggc tgaacggcaa agagtacaag 960
 tgcgtgggtgtt ccaacaaggc cctgcccacg tccatcgaga aaaccatcag caaggccaaag 1020
 ggccagcccc gcgaaacccca ggtgtacaca ctgcctccaa gccaggaaga gatgaccaag 1080
 aaccagggtgt ccctgacccctg tctctgtaaa ggcttctacc cctccgatata cgccgtggaa 1140
 tgggagagca acggccagcc cgagaacaca tacaagacca cccccctgt gctggacagc 1200
 gacggctcat tttccctgtta cagcagactg accgtggaca agagccgggtg gcaggaaggc 1260
 aacgtgttca gctgcagcgt gatgcacgag gccctgcaca accactacac ccagaagtcc 1320
 ctgtctgtga gcctggccaa g 1341

<210> SEQ ID NO 200

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 200

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cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgtacgc gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg	120
cctggcacag cccctaaact gctgatctac tacgacgacc tgcggectag cggcgtgcca	180
gatagatttt ctggcagcaa gageggcacc tctgccagcc tggctatttc tggactgcag	240
agcgaggacg aggcccacta ttattgtgcc gcctgggacg acagcctgaa cgtgtaccc	300
gtttttggcg gaggcaccaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgtg	360
acccctgtcc ctccaagcag cgaggaactg cagggcaaca aggccaccct cgtgtgcgtg	420
atcagcgaact tctatcctgg cgccgtgacc gtggcctggaa aggccatag ctctcctgtg	480
aaggccggcg tggaaaccac cacccttagc aagcagagca acaacaata cggccgcagc	540
agctacactga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 201

<211> LENGTH: 120

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 201

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly			
1	5	10	15
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr			
20	25	30	
Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val			
35	40	45	
Ser Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys			
50	55	60	
Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu			
65	70	75	80
Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala			
85	90	95	
Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln			
100	105	110	
Gly Thr Leu Val Thr Val Ser Ser			
115	120		

<210> SEQ ID NO 202

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 202

Ser Tyr Ala Met Ser	
1	5

<210> SEQ ID NO 203

<211> LENGTH: 16

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 203

-continued

```

Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
1           5           10          15

```

```

<210> SEQ ID NO 204
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

```

<400> SEQUENCE: 204

```

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
1           5           10

```

```

<210> SEQ ID NO 205
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

```

<400> SEQUENCE: 205

```

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1           5           10          15

```

```

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20          25          30

```

```

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35          40          45

```

```

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50          55          60

```

```

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65          70          75          80

```

```

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys His Ala Trp Asp Asp Ser Leu
85          90          95

```

```

Asn Asp Ile Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100         105        110

```

```

<210> SEQ ID NO 206
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

```

<400> SEQUENCE: 206

```

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
1           5           10

```

```

<210> SEQ ID NO 207
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

```

<400> SEQUENCE: 207

```

Tyr Asp Asp Leu Arg Pro Ser
1           5

```

```

<210> SEQ ID NO 208
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:

```

-continued

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 208

His Ala Trp Asp Asp Ser Leu Asn Asp Ile Val Val	
1	5
	10

<210> SEQ ID NO 209

<211> LENGTH: 360

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 209

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt cacctttagc agctacgcca ttagctgggt ccgacaggct	120
cctggcaaag gccttgaatg ggtgtccgca atcggctatg gggcgatac ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgcacag aaggcacac	300
tacaccagca gggacgcctt cgattattgg ggccaggcga cactggcac cgtttcttca	360

<210> SEQ ID NO 210

<211> LENGTH: 15

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 210

agctacgcca tgagc	15
------------------	----

<210> SEQ ID NO 211

<211> LENGTH: 48

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 211

gcacatggct atggcgccga tacctactac gcccactctg tgaaggc	48
---	----

<210> SEQ ID NO 212

<211> LENGTH: 36

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 212

agggacgact acaccagcag ggacgccttc gattat	36
---	----

<210> SEQ ID NO 213

<211> LENGTH: 333

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 213

cagtctgttc tgacacagcc tcctagcgcc tctggcacac ctggacagag agtgaccatc	60
---	----

agctgttagcg gcagcagctc caacatggc agcaacaccg tgaactggta tcagcagctg	120
---	-----

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cctggcacag cccctaaact gctgatctac taejacgacc tgccgcctag cgccgtgcc	180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag	240
agcgaggacg aggccgacta ctattgtcac gcctggacg acagcctgaa cgacatcgt	300
gtttttggcg gaggcaccaa gctgaccgtt cta	333

<210> SEQ ID NO 214
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 214

agcggcagca gctccaacat cggcagcaac accgtgaac	39
--	----

<210> SEQ ID NO 215
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 215

tacgacgacc tgccgcctag c	21
-------------------------	----

<210> SEQ ID NO 216
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 216

cacgcctggg acgacagcct gaacgacatc gtgggt	36
---	----

<210> SEQ ID NO 217
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 217

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr	
20 25 30	

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	

Ser Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Ala Asp Ser Val Lys	
50 55 60	

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala	
85 90 95	

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln	
100 105 110	

Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val	
115 120 125	

Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala	
---	--

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130	135	140
Leu	Gly	Cys
Leu	Val	Lys
		Asp
		Tyr
		Phe
		Pro
		Glu
		Pro
		Val
		Thr
		Val
145	150	155
Trp	Asn	Ser
Ala	Leu	Thr
		Ser
		Gly
		Val
		His
		Thr
		Phe
		Pro
		Ala
		Val
165	170	175
Leu	Gln	Ser
Ser	Gly	Leu
		Tyr
		Ser
		Leu
		Ser
		Ser
		Val
180	185	190
Ser	Ser	Ser
Leu	Gly	Thr
		Lys
		Thr
		Tyr
		Thr
		Cys
		Asn
		Val
		Asp
		His
195	200	205
Pro	Ser	Asn
Thr	Lys	Val
		Asp
		Lys
		Arg
		Val
		Glu
210	215	220
Pro	Cys	Pro
Pro	Cys	Pro
Ala	Pro	Glu
		Phe
		Leu
		Gly
		Gly
225	230	235
Phe	Leu	Phe
Pro	Pro	Lys
		Pro
		Lys
		Asp
		Thr
245	250	255
Pro	Glu	Val
Thr	Cys	Val
		Val
		Asp
		Val
		Ser
		Gln
		Glu
		Asp
		Pro
260	265	270
Val	Gln	Phe
Asn	Trp	Tyr
		Val
		Asp
		Gly
		Val
		Glu
		Val
		His
275	280	285
Thr	Lys	Pro
Arg	Glu	Glu
		Gln
		Phe
		Asn
		Ser
		Thr
		Tyr
290	295	300
Val	Leu	Thr
Thr	Val	Leu
		His
		Gln
		Asp
305	310	315
Cys	Lys	Val
Ser	Asn	Lys
		Gly
		Leu
		Pro
		Ser
		Ser
		Ile
325	330	335
Ser	Lys	Ala
		Lys
		Gly
		Gln
		Pro
		Arg
340	345	350
Pro	Ser	Gln
		Glu
		Met
		Thr
		Lys
355	360	365
Val	Lys	Gly
Phe	Tyr	Pro
		Ser
		Asp
		Ile
370	375	380
Gly	Gln	Pro
		Glu
		Asn
		Asn
		Tyr
385	390	395
Asp	Gly	Ser
Phe	Phe	Leu
		Tyr
		Ser
		Arg
405	410	415
Trp	Gln	Glu
		Asn
		Val
		Phe
		Ser
		Cys
		Ser
		Val
		Met
		His
		Glu
		Ala
		Leu
420	425	430
His	Asn	His
		Tyr
		Thr
		Gln
		Lys
435	440	445

<210> SEQ ID NO 218

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 218

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln	
1					5		10					15				

Arg	Val	Thr	Ile	Ser	Cys	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn		
					20		25					30			

Thr	Val	Asn	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu	Leu
					35		40					45			

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser

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50	55	60
Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln		
65	70	75
Ser Glu Asp Glu Ala Asp Tyr Tyr Cys His Ala Trp Asp Asp Ser Leu		
85	90	95
Asn Asp Ile Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly		
100	105	110
Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu		
115	120	125
Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe		
130	135	140
Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val		
145	150	155
Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys		
165	170	175
Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser		
180	185	190
His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu		
195	200	205
Lys Thr Val Ala Pro Thr Glu Cys Ser		
210	215	

<210> SEQ ID NO 219

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 219

gaagttcagc tgctgaaatc tggcgccgga ctgggttcaac ctggcggtatc tctgagactg	60
agctgtgcgg ccagcggtt cacctttagc agctacgcca tgagctgggt ccgacaggct	120
cctggcaaaag gccttgaatg ggtgtccgcg atcggctatg gcccgcatac ctactacgcc	180
gactctgtga aggggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
catatgtaaaca gcctgagagc cgaggacacc gccgtgtact attgcgcacag aaggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggggca cactggcac cgtttcttca	360
gccagcacca aggggccccag cgtgttccct ctggcccctt gtacgacaag caccagcgag	420
tctacagccg ccctgggtcg cctctgtgaag gactacttc cccgagccgt gaccgtgtcc	480
tggaaactctg ggcgtctgac aagcgccgtg cacaccttc cagccgtgt gcagacgac	540
ggccctgtact ctctgtacgac cgtctgtaca gtgcccagca gcaagcctggg caccaagacc	600
tacacctgtta acgtggacca caagccccag aacaccaagg tggacaagcg ggtggaatct	660
aagtacggcc ctccctgccc tccttgccca gcccctgaat ttctggccgg accctccgt	720
ttctctgttcc ccccaaagcc caaggacacc ctgtatgtca gcccggacccc cgaagtgacc	780
tgcgtgggtgg tggatgtgtc ccaggaatg cccgagggtgc agttcaatg gtacgtggac	840
ggcgtggaaag tgcacaacgc caagaccaag cccagagagg aacagttcaa cagcacctac	900
cgggtgggtgt ccgtgtgtac agtgtgtgcac caggactggc tgaacggcaa agagtacaag	960
tgcacaaaggcc cctgcccacg tccatcgaga aaaccatcag caaggccaaag	1020
ggccagcccc gcaaaaaacca ggtgtacaca ctgcctccaa gccaggaaga gatgaccaag	1080
aaccagggtgt ccctgacccgt tctctgtaaa ggcttctacc cctccgatata cgccgtggaa	1140

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tgggagagca acggccagcc cgagaacaac tacaagacca cccccctgt gctggacagc 1200
gacggctat ttctctgtt cagcagactg accgtggaca agagccggtg gcaggaaggc 1260
aacgtgttca gctgcagcgt gatgcacag gccctgcaca accactacac ccagaagtcc 1320
ctgtctctga gcctgggcaa g 1341

```

```

<210> SEQ ID NO 220
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

```

<400> SEQUENCE: 220

```

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc 60
agctgttagcg gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg 120
cctggcacag ccccttaact gctgtatctac tacgacgacc tgccggctag cggcgtgcca 180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag 240
agcggggacg aggcccacta ctattgtcac gcctgggacg acagcctgaa cgacatcgtg 300
gttttggcg gaggcaccaa gctgaccgtt cttaggccagc ctaaagocgc ccctagcgtg 360
acccctgtcc ctccaaagcag cggggaaactg caggccaaaca aggccacccct cgtgtgcctg 420
atcagcgact tctatcctgg cgccgtgacc gtggcctgga aggccgatag ctctcctgtg 480
aaggccggcg tgaaaaccac cacccttagc aagcagagca acaacaata cgccgcccagc 540
agctacctga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg 600
acccacgagg gcagcaccgt ggaaaagaca gtggccctca ccgagtgcag c 651

```

```

<210> SEQ ID NO 221
<211> LENGTH: 120
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

```

<400> SEQUENCE: 221

```

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30
Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45
Ser Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
50 55 60
Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
65 70 75 80
Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95
Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110
Gly Thr Leu Val Thr Val Ser Ser
115 120

```

```

<210> SEQ ID NO 222
<211> LENGTH: 5
<212> TYPE: PRT

```

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<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 222

Ser Tyr Ala Met Ser
1 5

<210> SEQ ID NO 223
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 223

Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> SEQ ID NO 224
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 224

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
1 5 10

<210> SEQ ID NO 225
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 225

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys His Ala Trp Asp Asp Ser Leu
85 90 95

Asn Asp Tyr Pro Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> SEQ ID NO 226
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 226

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
1 5 10

-continued

<210> SEQ ID NO 227
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 227

Tyr Asp Asp Leu Arg Pro Ser
1 5

<210> SEQ ID NO 228
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 228

His Ala Trp Asp Asp Ser Leu Asn Asp Tyr Pro Val
1 5 10

<210> SEQ ID NO 229
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 229

gaagttcagc tgctgaaatc tggcgccgga ctgggttcaac ctggcggttc tctgagactg	60
agctgtgcgg ccagcggtt caccttagc agctacgcca tgagctgggt ccgacaggct	120
cctggcaaag gccttgaatg ggtgtccgco atcggctatg gcggcgatac ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aagggacgac	300
tacaccagca gggacgcctt cgattattgg ggccagggca cactggtcac cgtttcttca	360

<210> SEQ ID NO 230
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 230

agctacgcca tgagc 15

<210> SEQ ID NO 231
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 231

gccatcggtt atggcgccga tacctactac gccgactctg tgaaggc 48

<210> SEQ ID NO 232
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45

Ser Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
 50 55 60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
 85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
 100 105 110

Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
 115 120 125

Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
 130 135 140

Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
 145 150 155 160

Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
 165 170 175

Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
 180 185 190

Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys
 195 200 205

Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro
 210 215 220

Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val
 225 230 235 240

Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
 245 250 255

Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu
 260 265 270

Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
 275 280 285

Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
 290 295 300

Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
 305 310 315 320

Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile
 325 330 335

Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
 340 345 350

Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
 355 360 365

Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
 370 375 380

Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser
 385 390 395 400

Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg
 405 410 415

Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
 420 425 430

His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
 435 440 445

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<210> SEQ ID NO 238

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 238

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1															
						5			10					15	

Arg	Val	Thr	Ile	Ser	Cys	Ser	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn
						20		25			30				

Thr	Val	Asn	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu	Leu
							35	40		45					

Ile	Tyr	Tyr	Asp	Asp	Leu	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser
						50	55		60						

Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu	Gln
						65	70		75		80				

Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	His	Ala	Trp	Asp	Asp	Ser	Leu
						85	90		95						

Asn	Asp	Tyr	Pro	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly	
						100	105		110						

Gln	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	Glu
						115	120		125						

Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	Phe
						130	135		140						

Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	Val
						145	150		155		160				

Lys	Ala	Gly	Val	Glu	Thr	Thr	Pro	Ser	Lys	Gln	Ser	Asn	Asn	Lys
						165	170		175					

Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	Ser
						180	185		190						

His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	Glu
						195	200		205						

Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser
						210	215	

<210> SEQ ID NO 239

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 239

gaagttcagc	tgcgttggaa	tggcgccgga	ctgggttcaac	ctggcggttc	tcttgatct	tcttgatct	60
------------	------------	------------	-------------	------------	-----------	-----------	----

agcttgtgccc	ccagcggttt	cacccttttagc	agctacggcca	tggatgtgggt	ccggacaggct	120
-------------	------------	--------------	-------------	-------------	-------------	-----

cctggcaaa	gccttgaatg	ggtgtccgccc	atccggctatg	gcggcgatac	ctactacgccc	180
-----------	------------	-------------	-------------	------------	-------------	-----

gactctgtga	agggcagattt	caccatcaggc	cgggacaaca	gcaagaacac	cctgttaccc	240
------------	-------------	-------------	------------	------------	------------	-----

cagatgttaca	gcgttggatc	cgaggacacc	gccgtgtact	atttgcgtcc	aagggtacgt	300
-------------	------------	------------	------------	------------	------------	-----

tacaccatggc	gggacggcctt	cgattatttg	ggccaggggca	cactggatcc	cgtttcttca	360
-------------	-------------	------------	-------------	------------	------------	-----

gccaggccat	agggccccccat	cgtgttccct	ctggcccccct	gtatcgatgg	caccaggcgat	420
------------	--------------	------------	-------------	------------	-------------	-----

tctacatggcg	cccttggggctg	cctctgttgc	gactactttc	ccgagccctgt	gaccgtgtcc	480
-------------	--------------	------------	------------	-------------	------------	-----

tggaaactctg	gcgttctgac	aagcgccgtg	cacacccccc	cagccgtgt	gcagagcagc	540
-------------	------------	------------	------------	-----------	------------	-----

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ggcctgtact	ctctgagcag	cgtcgtaaca	gtgcccagca	gcagcctggg	caccaagacc	600
tacacctgta	acgtggacca	caagcccago	aacaccaagg	tggacaagcg	ggtggaatct	660
aagtacggcc	ctccctgccc	tccttgcccc	gcccctgaat	ttctggggcg	accctccgtg	720
ttcctgttcc	ccccaaagcc	caaggacacc	ctgatgtaca	gccggacccc	cgaagtgacc	780
tgcggtgggg	ttggatgtgtc	ccaggaagat	cccgagggtgc	agttcaatgt	gtacgtggac	840
ggcggtggaa	tgccacaacgc	caagccaag	cccagagagg	aacagtccaa	cagcacctac	900
cgggtgggt	ccgtgtgtac	agtgtgtcac	caggactggc	tgaacggcaa	agagtacaag	960
tgcaagggtgt	ccaacaaggg	cctgcccago	tccatcgaga	aaaccatcag	caaggccaaag	1020
ggccagcccc	gcgaacccca	ggtgtacaca	ctgcctccaa	gccaggaaga	gatgaccaag	1080
aaccagggtgt	ccctgacactg	tctcgtgaaa	ggcttctacc	cctccgatata	cggcgtgaa	1140
tgggagagca	acggccagcc	cgagaacaac	tacaagacca	ccccccctgt	gctggacagc	1200
gacggctcat	ttttcctgtta	cagcagactg	accgtggaca	agagccggtg	gcaggaaggc	1260
aacgtgttca	gctgcacgt	gatgcacgag	gccctgcaca	accactacac	ccagaagtcc	1320
ctgtctctga	gcctggccaa	g				1341

<210> SEQ ID NO 240

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 240

cagtctgttc	tgacacagcc	tcctagcgcc	tctggcacac	ctggacagag	agtgaccatc	60
agctgtacg	gcagcagctc	caacatcgcc	agcaacaccc	tgaactggta	tcagcagctg	120
cctggcacag	cccctaaact	gctgatctac	tacgacgacc	tgcggcttag	cgccgtgcca	180
gatagatttt	ctggcagcaa	gagcggcacc	tctgcccggcc	tggctatttc	tggactgcag	240
agcgaggacg	aggccgacta	ctattgtcac	gcctgggacg	acagcctgaa	cgactaccct	300
gtttttggcg	gaggccaccaa	gctgaccgtt	ctaggccagc	ctaaagccgc	ccctagcgtg	360
accctgttcc	ctccaaggcag	cgaggaactg	caggccaaaca	aggccaccc	cgtgtgcctg	420
atcagcgact	tctatcctgg	cgccgtgacc	gtggcctggaa	aggccgatag	ctctcctgtg	480
aaggccggcg	tggaaaccac	cacccttagc	aagcagagca	acaacaata	cgccgcccagc	540
agctacactga	gcctgacccc	cgagcagtgg	aagtccacaca	gatcctacag	ctgccaagtg	600
acccacgagg	gcagcaccgt	ggaaaagaca	gtggccccta	ccgagtgcag	c	651

<210> SEQ ID NO 241

<211> LENGTH: 120

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 241

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

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Ser Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
 50 55 60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
 85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
 100 105 110

Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> SEQ ID NO 242
 <211> LENGTH: 5
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 242

Ser Tyr Ala Met Ser
 1 5

<210> SEQ ID NO 243
 <211> LENGTH: 16
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 243

Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
 1 5 10 15

<210> SEQ ID NO 244
 <211> LENGTH: 12
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 244

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
 1 5 10

<210> SEQ ID NO 245
 <211> LENGTH: 111
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 245

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
 20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
 35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
 50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
 65 70 75 80

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Ser Glu Asp Glu Ala Asp Tyr Tyr Cys His Ala Trp Asp Asp Ser Leu
85 90 95

Asn Val Tyr Pro Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> SEQ ID NO 246
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 246

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
1 5 10

<210> SEQ ID NO 247
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 247

Tyr Asp Asp Leu Arg Pro Ser
1 5

<210> SEQ ID NO 248
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 248

His Ala Trp Asp Asp Ser Leu Asn Val Tyr Pro Val
1 5 10

<210> SEQ ID NO 249
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 249

gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt caccttagc agctacgcca tgagctgggt ccgacaggt	120
cctggcaaag gccttgaatg ggtgtccgcc atcggctatg gccccatac ctactacgcc	180
gactctgtga agggcgatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggcga cactggtcac cgtttcttca	360

<210> SEQ ID NO 250
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 250

agctacgcca tgagc

15

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<210> SEQ ID NO 251
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 251
ggcatcggt atggcgccga tacctactac gcccactctg tgaaggc          48

<210> SEQ ID NO 252
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 252
agggacgact acaccagcag ggacgccttc gattat                      36

<210> SEQ ID NO 253
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 253
cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgtacgc gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg      120
cctggcacag cccctaaact gctgatctac tacgacgacc tgccgcctag cggcgtgcc      180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag      240
agcgaggacg aggccgacta ctattgtcac gcctggacg acagcctgaa cgtgtaccct      300
gtttttggcg gaggcaccaa gctgaccgtt cta                           333

<210> SEQ ID NO 254
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 254
agcggcagca gctccaacat cgccagcaac accgtgaac                      39

<210> SEQ ID NO 255
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 255
tacgacgacc tgccgcctag c                           21

<210> SEQ ID NO 256
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 256

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cacgcctggg acgacagcct gaacgtgtac cctgtt	36
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<210> SEQ ID NO 257
 <211> LENGTH: 447
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 257

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1					5			10				15			
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
	20				25				30						
Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
	35				40				45						
Ser	Ala	Ile	Gly	Tyr	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Lys	
	50				55			60							
Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr	Leu
	65				70			75		80					
Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	Ala
	85				90				95						
Arg	Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Tyr	Trp	Gly	Gln
	100				105			110							
Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val
	115				120			125							
Phe	Pro	Leu	Ala	Pro	Cys	Ser	Arg	Ser	Thr	Ser	Glu	Ser	Thr	Ala	Ala
	130				135			140							
Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser
	145				150			155		160					
Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val
	165				170			175							
Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro
	180				185			190							
Ser	Ser	Ser	Gly	Leu	Thr	Lys	Thr	Tyr	Thr	Cys	Asn	Val	Asp	His	Lys
	195				200			205							
Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Arg	Val	Glu	Ser	Lys	Tyr	Gly	Pro
	210				215			220							
Pro	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Phe	Leu	Gly	Gly	Pro	Ser	Val
	225				230			235		240					
Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr
	245				250			255							
Pro	Glu	Val	Thr	Cys	Val	Val	Asp	Val	Ser	Gln	Glu	Asp	Pro	Glu	
	260				265			270							
Val	Gln	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val	Glu	Val	His	Asn	Ala	Lys
	275				280			285							
Thr	Lys	Pro	Arg	Glu	Glu	Gln	Phe	Asn	Ser	Thr	Tyr	Arg	Val	Val	Ser
	290				295			300							
Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu	Asn	Gly	Lys	Glu	Tyr	Lys
	305				310			315		320					
Cys	Lys	Val	Ser	Asn	Lys	Gly	Leu	Pro	Ser	Ser	Ile	Glu	Lys	Thr	Ile
	325				330			335							
Ser	Lys	Ala	Lys	Gly	Gln	Pro	Arg	Glu	Pro	Gln	Val	Tyr	Thr	Leu	Pro
	340				345			350							

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Pro	Ser	Gln	Glu	Glu	Met	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu
355															365

Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn
370															380

Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser
385															400

Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Arg	Leu	Thr	Val	Asp	Lys	Ser	Arg
															415
405															410

Trp	Gln	Glu	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu
															430
420															425

His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Leu	Gly	Lys	
435															440
															445

<210> SEQ ID NO 258

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 258

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1															15
															10

Arg	Val	Thr	Ile	Ser	Cys	Ser	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn
															30
20															25

Thr	Val	Asn	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu	Leu
															35
															40

Ile	Tyr	Tyr	Asp	Asp	Leu	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser
															50

Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu	Gln
															65
															70

Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	His	Ala	Trp	Asp	Asp	Ser	Leu
															85
															90

Asn	Val	Tyr	Pro	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly	
															100
															105

Gln	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	Glu
															115
															120

Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	Phe
															130
															135

Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	Val
															145

Lys	Ala	Gly	Val	Glu	Thr	Thr	Pro	Ser	Lys	Gln	Ser	Asn	Asn	Lys	
															165
															170

Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	Ser
															180

His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	Glu
															195

Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser							
															210

<210> SEQ ID NO 259

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence
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<400> SEQUENCE: 259

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gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggctt caccttagc agctacgcca ttagctgggt ccgacaggct	120
cctggcaaag gccttgaatg ggtgtccgca atcggctatg gcccgcatac ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggcga cactggcac cgtttctca	360
gccagcacca agggccccag cgtgtccct ctggccctt ttagcagaag caccagcgag	420
tctacagccg ccctgggtcg cctctgtaa gactacttc ccgagccgt gaccgtgtcc	480
tggaaactctg ggcgtctgac aagccgcgtg cacacccctt cagccgtgct gcagacgac	540
ggccgtgtact ctctgtggcag cgtgtgaca gtggccagca gcagccctggg caccacggacc	600
tacacctgtta acgtggacca caagccca gaaacccaagg tggacaagcg ggtggaaatct	660
aagtacggcc ctccctgccc tccttgccca gcccctgaat ttctggccgg accccctcg	720
ttccctgttcc ccccaaagcc caaggacacc ctgtatgtca gcccggacccc cgaagtggacc	780
tgcgtgggtgg tggatgtgtc ccaggaat cccggagggtgc agttcaattt gtacgtggac	840
ggcggtggaaag tgcacaacgc caagaccaag cccagagagg aacagttcaa cagcacctac	900
cggggtgggtg ccgtgtgac agtgcgtgcac caggactggc tgaacggcaa agagtacaag	960
tgcacagggtgt ccaacaaggg cctgcccggc tccatcgaga aaaccatcag caaggccaa	1020
ggccagecccc gcaacccca ggtgtacaca ctgcctccaa gccaggaaaga gatgaccaag	1080
aaccagggtgt ccctgacctg tctctgtaaa ggtttctacc cctccgatat cgccgtggaa	1140
tgggagagca acggccagcc cgagaacaac tacaagacca cccccctgt gctggacacg	1200
gacggctcat ttttctgtta cagcagactg accgtggaca agagccgggtg gcaggaaggc	1260
aacgtgttca gtcgtggcgt gatgcacgag gcccgtcaca accactacac ccagaagtcc	1320
ctgtctctga gcctggccaa g	1341

<210> SEQ ID NO 260

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 260

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgcaccatc	60
agctgttagcg gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg	120
cctggccacag ccccttaact gctgtatctac tacgacgacc tgcggccctag cggcgccca	180
gatagatttt ctggcagaa gageggcacc tctgcccggc tggctatttc tggactgcag	240
agcgaggacg aggccgacta ctattgtcac gcctgggacg acagcctgaa cgtgtacccct	300
gtttttggcg gaggcaccaa gctgaccgtt cttagccagc ctaaagccgc ccctagcgtg	360
accctgttcc ctccaaagcg cggaggactg caggccaaaca aggccacccct cgtgtgcctg	420
atcagcgact tctatcctgg cgccgtgacc gtggccctgg aggccgatag ctctcctgtg	480
aaggccggcg tggaaaccac cacccttagc aagcagacca acaacaata cggccgcac	540
agctacctga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagt	600
acccacgagg gcagcaccgt gggaaagaca gtggccctca ccgagtcgac c	651

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<210> SEQ ID NO 261
<211> LENGTH: 120
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 261

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1							5		10				15		

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
								20		25		30			

Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
								35		40		45			

Ser	Ala	Ile	Gly	Tyr	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Lys
							50		55		60			

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

Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	Ala
							85		90		95				

Arg	Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Tyr	Trp	Gly	Gln
							100		105		110				

Gly	Thr	Leu	Val	Thr	Val	Ser	Ser
						115	120

<210> SEQ ID NO 262
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 262

Ser	Tyr	Ala	Met	Ser
1				5

<210> SEQ ID NO 263
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 263

Ala	Ile	Gly	Tyr	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Lys	Gly
1							5		10		15			

<210> SEQ ID NO 264
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 264

Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Tyr
1							5		10		

<210> SEQ ID NO 265
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:

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<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 265

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1				5				10				15			

Arg	Val	Thr	Ile	Ser	Cys	Ser	Gly	Ser	Ser	Asn	Ile	Gly	Ser	Asn
	20				25					30				

Thr	Val	Asn	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu	Leu
	35			40				45							

Ile	Tyr	Tyr	Asp	Asp	Leu	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser
50			55			55		60							

Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu	Gln
65				70			75				80				

Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	His	Ala	Trp	Asp	Asp	Ser	Leu
	85				90			90			95				

Asn	Val	Ile	Pro	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	
	100				105			105			110			

<210> SEQ ID NO 266

<211> LENGTH: 13

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 266

Ser	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn	Thr	Val	Asn
1					5			10				

<210> SEQ ID NO 267

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 267

Tyr	Asp	Asp	Leu	Arg	Pro	Ser
1			5			

<210> SEQ ID NO 268

<211> LENGTH: 12

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 268

His	Ala	Trp	Asp	Asp	Ser	Leu	Asn	Val	Ile	Pro	Val
1					5			10			

<210> SEQ ID NO 269

<211> LENGTH: 360

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 269

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg 60

agctgtgcgc ccagcggtt cacctttagc agctacgcca tgagctgggt ccgacaggct 120

cctggcaaag gccttgaatg ggtgtccgcc atcggtatg gcggcgatac ctactacgcc 180

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gactctgtga	agggcagatt	caccatcago	cgggacaaca	gcaagaacac	cctgtacctg	240
cagatgaaca	gcctgagagc	cgaggacacc	gccgtgtact	attgcgccag	aagggacgac	300
tacaccagca	gggacgcctt	cgattattgg	ggccagggca	cactggtcac	cgtttcttca	360

<210> SEQ ID NO 270		
<211> LENGTH: 15		
<212> TYPE: DNA		
<213> ORGANISM: Artificial Sequence		
<220> FEATURE:		
<223> OTHER INFORMATION: antibody sequence		
<400> SEQUENCE: 270		
agctacgcca	tgagc	15

<210> SEQ ID NO 271					
<211> LENGTH: 48					
<212> TYPE: DNA					
<213> ORGANISM: Artificial Sequence					
<220> FEATURE:					
<223> OTHER INFORMATION: antibody sequence					
<400> SEQUENCE: 271					
gccccatcggt	atggcggcga	tacctactac	gccgactctg	tgaagggc	48

<210> SEQ ID NO 272				
<211> LENGTH: 36				
<212> TYPE: DNA				
<213> ORGANISM: Artificial Sequence				
<220> FEATURE:				
<223> OTHER INFORMATION: antibody sequence				
<400> SEQUENCE: 272				
agggacact	acaccagcag	ggacgccttc	gattat	36

<210> SEQ ID NO 273						
<211> LENGTH: 333						
<212> TYPE: DNA						
<213> ORGANISM: Artificial Sequence						
<220> FEATURE:						
<223> OTHER INFORMATION: antibody sequence						
<400> SEQUENCE: 273						
cagtctgttc	tgacacagcc	tccttagcgcc	tctggcacac	ctggacagag	agtgaccatc	60
agctgttagcg	gcagcagctc	caacatcgcc	agcaacaccc	tgaactggta	tcagcagctg	120
cctggcacag	cccctaaact	gctgatctac	tacgacgacc	tgccgcctag	cggcgtgcca	180
gatagatttt	ctggcagcaa	gagcggcacc	tctgccagcc	tggctatttc	tggactgcag	240
agcgaggacg	aggccacta	ctattgtcac	gcctgggacg	acagcctgaa	cgtgatccct	300
gtttttggcg	gaggcaccaa	gctgaccgtt	cta			333

<210> SEQ ID NO 274				
<211> LENGTH: 39				
<212> TYPE: DNA				
<213> ORGANISM: Artificial Sequence				
<220> FEATURE:				
<223> OTHER INFORMATION: antibody sequence				
<400> SEQUENCE: 274				
agcggcagca	gctccaacat	cggcagcaac	accgtgaac	39

<210> SEQ ID NO 275	
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<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 275

tacgacgacc tgccggctag c

21

<210> SEQ ID NO 276
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 276

cacgcctggg acgacagcct gaacgtgatc cctgtt

36

<210> SEQ ID NO 277
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 277

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45Ser Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
50 55 60Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
65 70 75 80Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
115 120 125Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
130 135 140Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
145 150 155 160Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
165 170 175Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
180 185 190Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys
195 200 205Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro
210 215 220Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val
225 230 235 240Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
245 250 255

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Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu
260 265 270

Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
275 280 285

Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
290 295 300

Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
305 310 315 320

Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile
325 330 335

Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
340 345 350

Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
355 360 365

Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
370 375 380

Gly Gln Pro Glu Asn Asn Tyr Lys Thr Pro Pro Val Leu Asp Ser
385 390 395 400

Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg
405 410 415

Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
420 425 430

His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
435 440 445

<210> SEQ ID NO 278

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 278

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80Ser Glu Asp Glu Ala Asp Tyr Tyr Cys His Ala Trp Asp Asp Ser Leu
85 90 95Asn Val Ile Pro Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105 110Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
115 120 125Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
130 135 140Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
145 150 155 160Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
165 170 175

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Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
 180 185 190
 His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
 195 200 205
 Lys Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> SEQ ID NO 279
 <211> LENGTH: 1341
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 279
 gaagttcagc tgctggaatc tggcgccgga ctgggttcaac ctggcggttc tctgagactg 60
 agctgtgcgg ccagcggtt cacccttagc agctacgcca tgagctgggt ccgacaggct 120
 cctggcaaaag gccttgaaatg ggtgtccgccc atcggctatg gcggcgatac ctactacgccc 180
 gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacactg 240
 cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggcacgac 300
 tacaccagca gggacgcctt cgattattgg ggccaggcga cactggtcac cgtttcttca 360
 gccagcacca aggggccccag cgtgttccct ctggccctt gttagcagaag caccagcgag 420
 tctacagccg ccctggggctg cctctgtgaag gactacttc ccgagccccgt gaccgtgtcc 480
 tggaaactctg gcgctctgac aagcggcgtg cacaccttc cagccgtgct gcagagcagc 540
 ggcctgtact ctctgagcag cgtcgtgaca gtgcccagca gcagcctggg caccaagacc 600
 tacacctgtta acgtggacca caagcccaga aacaccaagg tggacaagcg ggtggaatct 660
 aagtacggcc ctccctgccc tccttgccca gcccctgaat ttctggccgg accctccgtg 720
 ttccctgttcc ccccaaagcc caaggacacc ctgtatgtaca gccggacccc cgaagtgacc 780
 tgctgttgttgg tggatgtgtc ccaggaagat cccgaggtgc agttcaattt gtacgtggac 840
 ggcgttggaaag tgcacaacgc caagaccaag cccagagagg aacagtcaa cagcacctac 900
 cgggttgtgt ccgtgtgtac agtgtgtcac caggactggc tgaacggcaa agagtacaag 960
 tgcaagggtgt ccaacaaggcc cctgcccaga tccatcgaga aaaccatcag caaggccaaag 1020
 ggcacccccc gcaacccca ggtgtacaca ctgcctccaa gccaggaaga gatgaccaag 1080
 aaccagggtgt ccctgacccctg tctctgtaaa ggcttctacc cctccgatat cgccgtggaa 1140
 tgggagagca acggccagcc cgagaacaac tacaagacca cccccctgt gctggacagc 1200
 gagccgtcat tcttcgtta cagcagactg accgtggaca agagccgggt gcaaggaaagc 1260
 aacgtgttca gctgcagcgt gatgcacgag gccctgcaca accactacac ccagaagtcc 1320
 ctgtctctgaa gcctggccaa g 1341

<210> SEQ ID NO 280
 <211> LENGTH: 651
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 280
 cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgcacatc 60
 agctgttagcg gcagcagctc caacatcgcc agcaacacccg tgaactggta tcagcagctg 120

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cctggcacag	cccctaact	gctgtatc	tacgacgacc	tgccggctag	cggcgtgcca	180				
gata	gat	ttt	ctggcagcaa	gagcggcacc	tctgccagcc	tggctatttc	tggactgcag	240		
agc	gagg	acg	aggccgacta	ctattgtcac	gcctgggacg	acagcctgaa	cgtgtatccc	300		
gtt	tttggcg	gaggcacc	aa	gctgaccgtt	ctaggccagc	ctaaagccgc	ccctagcgtg	360		
acc	ctgttcc	ctccaagcag	cgaggaa	ctg	aggccaaaca	aggccaccc	cgtgtgcctg	420		
atc	agc	gact	tctatc	ctgg	cgccgtgacc	gtggcctgga	aggccgatag	ctctctgtg	480	
aagg	ccggc	tg	gaa	acc	caccc	cttagc	aagcagagac	acaacaaata	cgccgc	540
agc	ta	ctg	ac	ctg	accc	cc	cg	gac	g	600
acc	ca	cq	aq	aq	cc	ct	qa	gt	q	661

<210> SEQ ID NO 281
<211> LENGTH: 120
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 281

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr
20 25 30

Ala Met Leu Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
50 55 60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110

Gly Thr Leu Val Thr Val Ser Ser
115 120

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<210> SEQ ID NO 282
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
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<400> SEQUENCE: 282

Ser Tyr Ala Met Leu
1 5

```
<210> SEQ ID NO 283
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 283

Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
1           5           10          15
```

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<210> SEQ ID NO 284
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 284

Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Tyr
1											

<210> SEQ ID NO 285
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 285

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1															

Arg	Val	Thr	Ile	Ser	Cys	Ser	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn
20															

Thr	Val	Asn	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu	Leu
35															

Ile	Tyr	Tyr	Asp	Asp	Leu	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser
50															

Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu	Gln
65															

Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ala	Ala	Trp	Asp	Asp	Ser	Leu
85															

Asn	Asp	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	
100														

<210> SEQ ID NO 286
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 286

Ser	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn	Thr	Val	Asn
1												

<210> SEQ ID NO 287
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 287

Tyr	Asp	Asp	Leu	Arg	Pro	Ser
1						

<210> SEQ ID NO 288
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 288

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Ala	Ala	Trp	Asp	Asp	Ser	Leu	Asn	Asp	Tyr	Val	Val
1		5			10						

```

<210> SEQ ID NO 289
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 289
gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcggtatc tctgagactg      60
agctgtgcgg ccagcggctt cacctttac agctacgcca tgctgtgggt ccgacaggcc      120
cctggaaaag gccttgaatg ggtgtccggc atcggcacag gcccgcatac ctactatgcc      180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg      240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggacgac      300
tacaccagca gggacgcctt cgattattgg ggccaggcca cactggtcac cgtttcttca      360

<210> SEQ ID NO 290
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 290
agctacgcca tgctg      15

<210> SEQ ID NO 291
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 291
gccatcgca caggcgccga tacctactat gccgactctg tgaaggcc      48

<210> SEQ ID NO 292
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 292
agggacgact acaccagcag ggacgccttc gattat      36

<210> SEQ ID NO 293
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 293
cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttagcg gcagcagctc caacatcgcc agcaacaccg tgaactggta tcagcagctg      120
cctggcacag cccctaaact gctgatctac tacgacgacc tgccgcctag cggcgccca      180
gatagatttt ctggcagcaa gagcggcacc tctgcccagcc tggctatttc tggactgcag      240

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agcgaggacg aggccgacta ttattgtgcc gcctggacg acagcctgaa cgactacgtt 300
 gtgtttggcg gaggcaccaa gctgaccgtt cta 333

<210> SEQ ID NO 294
 <211> LENGTH: 39
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 294

agcggcagca gctccaacat cggcagcaac accgtgaac 39

<210> SEQ ID NO 295
 <211> LENGTH: 21
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 295

tacgacgacc tgccgcctag c 21

<210> SEQ ID NO 296
 <211> LENGTH: 36
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 296

gcccgcctggg acgacagcct gaacgactac gtttgt 36

<210> SEQ ID NO 297
 <211> LENGTH: 447
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 297

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
 1 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr
 20 30

Ala Met Leu Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 45

Ser Ala Ile Gly Thr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
 50 60

Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
 65 80

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
 85 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
 100 110

Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
 115 125

Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
 130 140

Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser

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145	150	155	160
Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val			
165	170	175	
Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro			
180	185	190	
Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys			
195	200	205	
Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro			
210	215	220	
Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val			
225	230	235	240
Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr			
245	250	255	
Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu			
260	265	270	
Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys			
275	280	285	
Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser			
290	295	300	
Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys			
305	310	315	320
Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile			
325	330	335	
Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro			
340	345	350	
Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu			
355	360	365	
Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn			
370	375	380	
Gly Gln Pro Glu Asn Asn Tyr Lys Thr Pro Pro Val Leu Asp Ser			
385	390	395	400
Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg			
405	410	415	
Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu			
420	425	430	
His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys			
435	440	445	

<210> SEQ ID NO 298

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 298

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

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65	70	75	80
Ser	Glu	Asp	Glu
Ala	Asp	Tyr	Tyr
Cys	Ala	Ala	Trp
		Asp	Asp
		Ser	Leu
85		90	95
Asn	Asp	Tyr	Val
Val	Val	Phe	Gly
		Gly	Gly
		Thr	Lys
		Leu	Thr
		Val	Leu
			Gly
100		105	110
Gln	Pro	Lys	Ala
Ala	Ala	Pro	Ser
		Val	Thr
		Leu	Phe
		Pro	Pro
		Ser	Ser
		Glu	
115		120	125
Glu	Leu	Gln	Ala
Asn	Lys	Ala	Thr
		Leu	Val
		Cys	Leu
		Ile	Ser
		Asp	Phe
130		135	140
Tyr	Pro	Gly	Ala
Ala	Val	Thr	Val
		Ala	Trp
		Lys	Ala
		Asp	Ser
		Ser	Ser
		Pro	Val
145		150	155
Lys	Ala	Gly	Val
		Glu	Thr
		Thr	Thr
		Pro	Ser
		Lys	Gln
		Ser	Ser
		Asn	Asn
		Lys	
165		170	175
Tyr	Ala	Ala	Ser
		Ser	Tyr
		Leu	Ser
		Leu	Thr
		Pro	Glu
		Gln	Trp
		Lys	Ser
180		185	190
His	Arg	Ser	Tyr
		Ser	Ser
		Cys	Gln
		Val	Thr
		His	Glu
		Gly	Ser
		Ser	Thr
		Val	Glu
195		200	205
Lys	Thr	Val	Ala
		Pro	Thr
		Glu	Cys
		Ser	
210		215	

<210> SEQ ID NO 299

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 299

gaagttcagc	tgcttgaatc	tggcgccgga	ctgggttcaac	ctggcggttc	tctgagactg	60
agctgtgcgcg	ccagcggctt	cacctttac	agctacgcca	tgctgtgggt	ccgacaggcc	120
cctggaaaag	gccttgaatg	ggtgtccgcc	atcggcacag	gccccgcatac	ctactatgcc	180
gactctgtga	agggcagatt	caccatcago	cgggacaaca	gcaagaacac	cctgtactcg	240
catatgaaca	gcctgagagc	cgaggacacc	gcccgtgtact	attgcgccag	aagggacgac	300
tacaccagca	gggacgcctt	cgattattgg	ggccaggggca	cactggtcac	cgtttcttca	360
gccagcacca	agggccccag	cgttccct	ctggccccc	gttagcagaag	caccagcgag	420
tctacagccg	ccctgggctg	cctcgtgaag	gactacttc	ccgagccccgt	gaccgtgtcc	480
tggaaactctg	gcgcctctgac	aagcggcggt	cacacccccc	cagccgtgtct	gcagagcagc	540
ggcctgtact	ctctgagcag	cgtcgtgaca	gtgcccagca	gcagcctggg	caccaagacc	600
tacacctgtta	acgttggacca	caagcccagc	aacaccaagg	tggacaagcg	ggttggatct	660
aagtatcgcc	ctccctgccc	tccttgccca	gcccctgaat	ttctggggccg	accctccgt	720
ttcctgttcc	ccccaaagcc	caaggacacc	ctgatgtatc	gccggacccc	cgaagtgtacc	780
tgcgtgttgg	tggatgtgtc	ccaggaagat	cccgaggtgc	agttcaatgt	gtacgtggac	840
ggcgttggaa	tgcacaacgc	caagaccaag	cccagagagg	aacagttcaa	cagcacctac	900
cgggtgttgt	cctgtgtgac	agtgtgtgcac	caggactggc	tgaacggcaa	agagtacaag	960
tgcgttgtgt	ccaacaaggg	cctgcccgc	tccatcgaga	aaaccatcag	caaggccaa	1020
ggccagcccc	gcgaacccca	ggtgtacaca	ctgcctccaa	gccaggaaaga	gatgaccaag	1080
aaccaggtgt	ccctgacactg	tctcgtgaaa	ggcttctacc	cctccgatat	cgccgtggaa	1140
tgggagagca	acggccagcc	cgagaacaac	tacaagacca	ccccccctgt	gctggacagc	1200

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gacggctcat tttcctgtat cagcagactg accgtggaca agagccgggtgcaggaaggc	1260
aacgtgttca gtcgcagcgt gatgcacgag gcccgtcaca accactacac ccagaagtcc	1320
ctgtctctgat cctggggcaa g	1341

<210> SEQ ID NO 300
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 300

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgttagcg cgacgcgctc caacatcgcc agcaacaccc tgaactggta tcagcagctg	120
cctggcacag cccctaaact gctgatctac tacgacgacc tgcggcttag cgccgtgcca	180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag	240
agcgaggacg aggccgacta ttattgtgcc gcctgggacg acagcctgaa cgactacgtt	300
gtgtttggcg gaggcaccaa gctgaccgtt cttagccagc ctaaagccgc ccctagcgtg	360
accctgttcc ctccaagcag cgaggaaactg caggccaaaca aggccaccct cgtgtgcctg	420
atcagcgact tctatcctgg cgccgtgacc gtggcctggaa aggccgatag ctctcctgtg	480
aaggccggcg tggaaaaccac cacccctago aagcagagca acaacaataa cgccgcccagc	540
agctacactga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 301
<211> LENGTH: 120
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 301

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr	
20 25 30	
Ala Met Leu Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	
Ser Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys	
50 55 60	
Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu	
65 70 75 80	
Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala	
85 90 95	
Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln	
100 105 110	
Gly Thr Leu Val Thr Val Ser Ser	
115 120	

<210> SEQ ID NO 302
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 302

Ser Tyr Ala Met Leu
1 5

<210> SEQ ID NO 303
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 303

Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> SEQ ID NO 304
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 304

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
1 5 10

<210> SEQ ID NO 305
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 305

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
85 90 95

Asn Val Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> SEQ ID NO 306
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 306

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
1 5 10

<210> SEQ ID NO 307
<211> LENGTH: 7

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<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 307

Tyr Asp Asp Leu Arg Pro Ser
1 5

<210> SEQ ID NO 308
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 308

Ala Ala Trp Asp Asp Ser Leu Asn Val Tyr Val Val
1 5 10

<210> SEQ ID NO 309
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 309

gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcggtc tctgagactg	60
agctgtgccg ccagcggctt cacctttac agtcacgcca tgctgtgggt ccgacaggcc	120
cctggaaaag gccttgaatg ggtgtccgcc atcggcacag gcccgcatac ctactatgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggcga cactggtcac cgtttctca	360

<210> SEQ ID NO 310
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 310

agctacgcca tgctg	15
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<210> SEQ ID NO 311
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 311

cccatcgcca caggcgccga tacctactat gccgactctg tgaaggcc	48
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<210> SEQ ID NO 312
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 312

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agggacact acaccagcag ggacgccttc gattat	36
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<210> SEQ ID NO 313
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 313

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttagcg gcacgcgctc caacatcgcc agcaacaccc tgaactggta tcagcagctg      120
cctggcacag cccctaaact gctgatctac tacgacgacc tgccgcctag cggcgtgcca      180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag      240
agcgaggacg aggccgacta ttattgtgcc gcctgggacg acagcctgaa cgtgtacgtt      300
gtgtttggcg gaggcaccaa gctgaccgtt cta                                333

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<210> SEQ ID NO 314
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 314

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agcggcagca gctccaacat cgccagcaac accgtgaac	39
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<210> SEQ ID NO 315
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 315

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tacgacgacc tgccgcctag c	21
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<210> SEQ ID NO 316
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 316

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ggccgcctggg acgacagcct gaacgtgtac gttgtg	36
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<210> SEQ ID NO 317
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 317

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Glu Val Gln Leu Leu Glu Ser Gly Gly	10	15	
1	5		

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr	25	30	
20			

Ala Met Leu Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	40	45	
35			

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Ser Ala Ile Gly Thr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
 50 55 60
 Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu
 65 70 75 80
 Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
 85 90 95
 Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
 100 105 110
 Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
 115 120 125
 Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
 130 135 140
 Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
 145 150 155 160
 Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
 165 170 175
 Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
 180 185 190
 Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys
 195 200 205
 Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro
 210 215 220
 Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val
 225 230 235 240
 Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
 245 250 255
 Pro Glu Val Thr Cys Val Val Asp Val Ser Gln Glu Asp Pro Glu
 260 265 270
 Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
 275 280 285
 Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
 290 295 300
 Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
 305 310 315 320
 Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile
 325 330 335
 Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
 340 345 350
 Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
 355 360 365
 Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
 370 375 380
 Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser
 385 390 395 400
 Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg
 405 410 415
 Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
 420 425 430
 His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
 435 440 445

<210> SEQ ID NO 318

<211> LENGTH: 217

<212> TYPE: PRT

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<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 318

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gln
1														
						5		10					15	

Arg	Val	Thr	Ile	Ser	Cys	Ser	Gly	Ser	Ser	Asn	Ile	Gly	Ser	Asn
							20	25				30		

Thr	Val	Asn	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu	Leu
							35	40				45			

Ile	Tyr	Tyr	Asp	Asp	Leu	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe	Ser
						50	55		60						

Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu	Gln
							65	70		75			80		

Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ala	Ala	Trp	Asp	Asp	Ser	Leu
							85	90		95					

Asn	Val	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly
						100		105			110			

Gln	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	Glu
							115	120			125				

Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	Phe
							130	135			140				

Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	Val
							145	150		155		160			

Lys	Ala	Gly	Val	Glu	Thr	Thr	Pro	Ser	Lys	Gln	Ser	Asn	Asn	Lys
							165	170		175				

Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	Ser
						180		185			190				

His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	Glu
							195	200		205					

Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser
						210	215	

<210> SEQ ID NO 319

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 319

gaagttcagc tgctgaaatc tggcgccgga ctgggttcaac ctggcggttc tcttgagactg 60

agctgtgcgg ccagcggctt cacctttac agctacgcca tgctgtgggt ccgacaggcc 120

cctggaaaag gccttgaatg ggtgtccgca atcggcacag gcccgcatac ctactatgcc 180

gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg 240

cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgcacag aaggacgac 300

tacaccagca gggacgcctt cgattattgg ggccaggcga cactggtcac cgtttcttca 360

gccagcacca agggccccag cgtgttccct ctggcccccgtt gtagcagaag caccagcgag 420

tctacagccg ccctgggctg cctcgtgaag gactacttcc ccgagccctgt gaccgtgtcc 480

tggaaactctg cgcgtctgac aagcggcgtg cacaccttcc cagccgtgtc gcagacgac 540

ggcctgtact ctctgagcag cgtcgtgaca gtgcccagca gcagcctggg caccacgacc 600

tacacctgtta acgtggacca caagcccagc aacaccaagg tggacaagcg ggtgaaatct 660

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aagtacggcc ctccctgccc tccttgccca gcccctgaat ttctggcggt accctccgtg	720
ttcctgttcc ccccaaagcc caaggacacc ctgatgtatca gccggacccc cgaagtgacc	780
tgcgtggtgg tggatgtgtc ccaggaagat cccgaggtgc agttcaattt gtacgtggac	840
ggcgtgaaag tgcacaacgc caagaccaag cccagagagg aacagtccaa cagcacctac	900
cgggtggtgt ccgtgctgac agtgcgtgcac caggactggc tgaacggcaa agagtacaag	960
tgcaagggtgt ccaacaaggg cctgcccaga tccatcgaga aaaccatcag caaggccaag	1020
ggccagcccc gcgaacccca ggtgtacaca ctgcctccaa gccaggaaga gatgaccaag	1080
aaccagggtgt ccctgacctg tctcgtaaaa ggcttctacc cctccgatata cgccgtggaa	1140
tgggagagca acggccagcc cgagaacaac tacaagacca cccccctgt gctggacagc	1200
gacggctcat ttttcgttca cagcagactg accgtggaca agagccgggt gcaggaaggc	1260
aacgtgttca gctgcagcgt gatgcacgag gccctgcaca accactacac ccagaagtcc	1320
ctgtctctga gcctggcaa g	1341

<210> SEQ ID NO 320

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 320

cagtctgttc tgacacagcc tccttagcgc tctggcacac ctggacagag agtgaccatc	60
agctgttagcg gcagcagctc caacatcgcc acaacacccg tgaactggta tcagcagctg	120
cctggcacag ccccttaact gctgtatctac tacgacgacc tgccgcctag cggcgtgcca	180
gatagattt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag	240
agcgaggacg aggccacta ttattgtgcc gcctgggacg acagcctgaa cgtgtacgtt	300
gtgtttggcg gaggcaccaa gctgaccgtt cttagccagc ctaaagccgc ccctagcgtg	360
accctgttcc ctccaaagcag cgaggaaactg caggccaaaca aggccacccct cgtgtgcctg	420
atcagcgtact tctatcctgg cgccgtgacc gtggcctggaa aggccgatag ctctcctgtg	480
aaggccggcg tggaaaccac cacccttago aagcagagca acaacaata cgccgccagc	540
agctacctga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 321

<211> LENGTH: 120

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 321

Glu Val Gln Leu Leu Glu Ser Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr	
20 25 30	

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	

Ser Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys	
50 55 60	

-continued

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110

Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> SEQ ID NO 322

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 322

Ser Tyr Ala Met Ser
1 5

<210> SEQ ID NO 323

<211> LENGTH: 16

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 323

Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> SEQ ID NO 324

<211> LENGTH: 12

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 324

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr
1 5 10

<210> SEQ ID NO 325

<211> LENGTH: 111

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 325

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys His Ala Trp Asp Asp Ser Leu
85 90 95

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Asn	Val	Tyr	Pro	Val	Phe	Gly	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu
100						105								110

<210> SEQ ID NO 326
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 326

Ser	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ser	Asn	Thr	Val	Asn
1					5							10

<210> SEQ ID NO 327
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 327

Tyr	Asp	Asp	Leu	Arg	Pro	Ser
1					5	

<210> SEQ ID NO 328
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 328

His	Ala	Trp	Asp	Asp	Ser	Leu	Asn	Val	Tyr	Pro	Val
1					5						10

<210> SEQ ID NO 329
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 329

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgccg ccagcggtt cacctttac agctacgcca tgagctgggt ccgacaggcc	120
cctggaaaag gccttgaatg ggtgtccgccc atcggctatg gccccgatac ctactacgccc	180
gactctgtga agggcagatt caccatcagc cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aagggacgac	300
tacaccagca gggacgcctt cgattattgg ggccagggca cactggtcac cgtttcttca	360

<210> SEQ ID NO 330
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 330

agctacgcca tgagc	15
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<210> SEQ ID NO 331
<211> LENGTH: 48

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<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 331

ggccatcggt atggcggcga tacctactac gccgactctg tgaaggc

48

<210> SEQ ID NO 332
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 332

agggacgact acaccagcag ggacgccttc gattat

36

<210> SEQ ID NO 333
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 333

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc

60

agctgttagcg gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg

120

cctggcacag cccctaaact gctgatctac tacgacgacc tgcggcttag cggcgtgcc

180

gatagatttt ctggcagcaa gageggcacc tctgccagcc tggctatttc tggactgcag

240

agcgaggacg aggccgacta ctattgtcac gcctgggacg acagcctgaa cgtgtacctt

300

gtttttggcg gaggcaccaa gctgaccgtt cta

333

<210> SEQ ID NO 334
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 334

agcggcagca gctccaacat cggcagcaac accgtgaac

39

<210> SEQ ID NO 335
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 335

tacgacgacc tgcggcttag c

21

<210> SEQ ID NO 336
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 336

cacgcctggg acgacagcct gaacgtgtac cctgtt

36

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<210> SEQ ID NO 337
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 337

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Ala Ile Gly Tyr Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
50 55 60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110

Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val
115 120 125

Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
130 135 140

Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
145 150 155 160

Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val
165 170 175

Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro
180 185 190

Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys
195 200 205

Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro
210 215 220

Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val
225 230 235 240

Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
245 250 255

Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu
260 265 270

Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
275 280 285

Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
290 295 300

Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
305 310 315 320

Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile
325 330 335

Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
340 345 350

Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
355 360 365

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Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
 370 375 380

Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser
 385 390 395 400

Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg
 405 410 415

Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
 420 425 430

His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
 435 440 445

<210> SEQ ID NO 338

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 338

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
 20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
 35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
 50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
 65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys His Ala Trp Asp Asp Ser Leu
 85 90 95

Asn Val Tyr Pro Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
 100 105 110

Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
 115 120 125

Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
 130 135 140

Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
 145 150 155 160

Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
 165 170 175

Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
 180 185 190

His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
 195 200 205

Lys Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> SEQ ID NO 339

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 339

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg 60

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agctgtgcgcg ccagcggctt cacttttac agctacgcca tgagctgggt ccgacaggcc	120
cctggaaaag gccttgaatg ggtgtccgcc atcggctatg gggcgatac ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
catatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aagggacgac	300
tacaccagca gggacgcctt cgattattgg ggccaggggca cactggcac cgttctca	360
gccagcacca agggccccag cgttccct ctggccctt gtgcagaag caccagcgag	420
tctacagccg ccctgggctg cctcgtgaag gactacttc ccgagccgt gaccgtgtcc	480
tggaaactctg ggcgtctgac aagggcggtg cacacccccc cagccgtgt gcagagcagc	540
ggcctgtact ctctgagcag cgtcgtgaca gtgcctggca gcagcctggg caccaagacc	600
taacacctgta acgtggacca caagccagc aacaccaagg tggacaagcg ggtggatct	660
aagtacggcc ctccctgccc tccttgccca gcccctgaat ttctggccgg accctccgt	720
ttctctgtcc ccccaaagcc caaggacacc ctgatgtca gccggacccc cgaagtgacc	780
tgcggtgtgg tggatgtgtc ccaggaagat cccgagggtgc agttcaatg gtacgtggac	840
ggcggtggaa tgcacaacgc caagaccaag cccagagagg aacagtccaa cagcacctac	900
cggggtgtgt cctgtgtgac agtgcgtgcac caggactggc tgaacggcaa agagtacaag	960
tgcaagggtgt ccaacaaggg cctgcccagc tccatcgaga aaaccatcag caaggccaa	1020
ggccagcccc gogaacccca ggtgtacaca ctgcctccaa gccaggaaaga gatgaccaag	1080
aaccagggtgt ccctgaccc tctcgtgaaa ggcttctacc cctccgatata cgccgtggaa	1140
tgggagagca acggccagcc cgagaacaaac tacaagacca ccccccctgt gctggacagc	1200
gacggctcat tcttcctgta cagcagactg accgtggaca agagccggg gcaggaaggc	1260
aacgtgttca gctgcacgt gatgcacgag gccctgcaca accactacac ccagaagtcc	1320
ctgtctctga gcctggccaa g	1341

<210> SEQ ID NO 340

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 340

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgttagcg cgacgcgctc caacatcgcc agcaacaccg tgaactggta tcagcagctg	120
cctggcacag cccctaaact gctgtatctac tacgacgacc tgccgtctggccca	180
gatagatttt ctggcagcaa gagcggcacc tctggccagcc tggctatttc tggactgcag	240
agcgaggacg aggccgacta ctattgtcac gcctggacg acagcctgaa cgtgtaccct	300
gtttttggcg gaggcaccaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgt	360
accctgttcc ctccaaagcag cgaggaaactg caggccaaaca aggccaccct cgttgctg	420
atcagcgact tctatcctgg cgccgtgacc gtggcctggaa aggccgatag ctctcctgt	480
aaggccggcg tggaaaccac cacccttago aagcagacca acaacaata cgccgcccagc	540
agctacactga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagt	600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 341

<211> LENGTH: 120

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<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 341

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1					5						10				15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
50 55 60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
100 105 110

Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> SEQ ID NO 342
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 342

Ser	Tyr	Ala	Met	Ser
1				5

<210> SEQ ID NO 343
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 343

Ala	Ile	Gly	Tyr	Gly	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Lys	Gly
1						5		10						15	

<210> SEQ ID NO 344
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 344

Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Tyr
1						5			10		

<210> SEQ ID NO 345
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 345

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Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15
 Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
 20 25 30
 Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
 35 40 45
 Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
 50 55 60
 Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
 65 70 75 80
 Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
 85 90 95
 Asn Asp Ile Pro Val Phe Gly Gly Thr Lys Leu Thr Val Leu
 100 105 110

<210> SEQ ID NO 346

<211> LENGTH: 13

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 346

Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn Thr Val Asn
 1 5 10

<210> SEQ ID NO 347

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 347

Tyr Asp Asp Leu Arg Pro Ser
 1 5

<210> SEQ ID NO 348

<211> LENGTH: 12

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 348

Ala Ala Trp Asp Asp Ser Leu Asn Asp Ile Pro Val
 1 5 10

<210> SEQ ID NO 349

<211> LENGTH: 360

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 349

gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg 60
 agctgtgccg ccagcggctt cacctttac agctacgcca tgagctgggt ccgacaggcc 120
 cctggaaaag gccttgaatg ggtgtccgccc atcggctatg gcggcgatac ctactacgccc 180
 gactctgtga agggcagatt caccatcagc cgggacaaca gcaagaacac cctgtacctg 240

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cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aaggacgac 300

tacaccagca gggacgcctt cgattattgg ggcgcaggca cactggtcac cgtttctca 360

<210> SEQ ID NO 350

<211> LENGTH: 15

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 350

agctacgcca tgaga

15

<210> SEQ ID NO 351

<211> LENGTH: 48

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 351

gccccatcggt atggcgccga tacctactac gccgactctg tgaaggc

48

<210> SEQ ID NO 352

<211> LENGTH: 36

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 352

aggggacgact acaccagcag ggacgccttc gattat

36

<210> SEQ ID NO 353

<211> LENGTH: 333

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 353

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc

60

agctgttagcg cgacgcgctc caacatcgcc agcaacaccc tgaactggta tcagcagctg

120

cctggcacag cccctaaact gctgtatctac tacgacgacc tgccgcttag cggcgtgcca

180

gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag

240

agcgaggacg aggccgacta ttatttgccgc gcctggacg acagcctgaa cgacatccct

300

gtttttggcg gaggccacaa gctgaccgtt cta

333

<210> SEQ ID NO 354

<211> LENGTH: 39

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 354

agcggcagca gctccaacat cgccagcaac accgtgaac

39

<210> SEQ ID NO 355

<211> LENGTH: 21

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

-continued

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 355

tacgacgacc tgccggcttag c

21

<210> SEQ ID NO 356

<211> LENGTH: 36

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 356

ggccgcctggg accgacagcct gaacgacatc cctgtt

36

<210> SEQ ID NO 357

<211> LENGTH: 447

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 357

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1							5		10				15		

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Tyr	Ser	Tyr
								20		25		30			

Ala	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
								35		40		45			

Ser	Ala	Ile	Gly	Tyr	Gly	Gly	Asp	Thr	Tyr	Tyr	Ala	Asp	Ser	Val	Lys
							50		55		60				

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

Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys	Ala
							85		90		95				

Arg	Arg	Asp	Asp	Tyr	Thr	Ser	Arg	Asp	Ala	Phe	Asp	Tyr	Trp	Gly	Gln
							100		105		110				

Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val
							115		120		125				

Phe	Pro	Leu	Ala	Pro	Cys	Ser	Arg	Ser	Thr	Ser	Glu	Ser	Thr	Ala	Ala
							130		135		140				

Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val	Thr	Val	Ser
							145		150		155		160		

Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe	Pro	Ala	Val
							165		170		175				

Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val	Thr	Val	Pro
							180		185		190				

Ser	Ser	Ser	Leu	Gly	Thr	Lys	Thr	Tyr	Thr	Cys	Asn	Val	Asp	His	Lys
							195		200		205				

Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Arg	Val	Glu	Ser	Lys	Tyr	Gly	Pro
							210		215		220				

Pro	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Phe	Leu	Gly	Gly	Pro	Ser	Val
							225		230		235		240		

Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr	Leu	Met	Ile	Ser	Arg	Thr
							245		250		255				

Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val	Ser	Gln	Glu	Asp	Pro	Glu
							260		265		270				

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Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
275 280 285

Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser
290 295 300

Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
305 310 315 320

Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile
325 330 335

Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
340 345 350

Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
355 360 365

Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
370 375 380

Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser
385 390 395 400

Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg
405 410 415

Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
420 425 430

His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys
435 440 445

<210> SEQ_ID NO 358
<211> LENGTH: 217
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 358

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn
20 25 30

Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu
35 40 45

Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser
50 55 60

Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln
65 70 75 80

Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu
85 90 95

Asn Asp Ile Pro Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105 110

Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
115 120 125

Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
130 135 140

Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
145 150 155 160

Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
165 170 175

Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
180 185 190

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His	Arg	Ser	Tyr
Ser	Cys	Gln	Val
195		200	

Lys	Thr	Val	Ala
Pro	Glu	Cys	Ser
210		215	

<210> SEQ ID NO 359

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 359

gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgc ccageggctt cacctttac agctacgcca ttagctgggt ccgacaggcc	120
cctggaaaag gccttgaatg ggtgtccgca atcggctatg gggcgatac ctactacgcc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgcacag aaggacgac	300
tacaccagca gggacgcctt cgattattgg ggcgcaggca cactggcac cggttcttca	360
ggcagcacca agggccccag cgtgttcctt ctggccctt ttagcagaag caccagcgg	420
tctacagccg ccctgggttg cctctgtaaag gactacttc cccggccctgt gaccgtgtcc	480
tggaaactctg gcgcctgtac aageggcggtg cacacccccc cagccgtgt gcagacgac	540
ggcctgtact ctctgagcag cgctgtgaca gtgcgcagca gcagcctggg caccacggcc	600
tacacctgtta acgtggacca caagcccaac aacaccaagg tggacaagg ggtggatct	660
aagtacggcc ctccctgccc tccttgccca gcccctgaat ttctggccgg accctccgt	720
ttccctgttcc ccccaaagcc caaggacacc ctgtatgtca gcccggccccc cgaagtgacc	780
tgctgtgggg tggatgtgtc ccaggaat cccgggggtgc agttcaatgg ttagcgtggac	840
ggcgtgtgg tgcacaacgc caagaccaag cccagagagg aacagtccaa cagcacctac	900
ccgggtgtgt ccgtgtgac agtgcgtcac caggactggc tgaacggcaa agagtacaag	960
tgcaagggtgt ccaacaaggc cctgcccacg tccatcgaga aaaccatcag caaggccaa	1020
ggccagecccc gcgaacccca ggtgtacaca ctgcctccaa gccaggaaaga gatgaccaag	1080
aaccagggtgt ccctgacccgt tctctgtaaa ggcttctacc cctccgatat cgccgtggaa	1140
tggagagacca acggccagcc cgagaacaac tacaagacca ccccccctgt gctggacac	1200
gacggctcat tcttcctgtta cagcagactg accgtggaca agagccgggtg gcaggaaggc	1260
aacgtgttca gctgcagcgt gatgcacgag gcccgtcaca accactacac ccagaagtcc	1320
ctgtctgtac gcctggccaa g	1341

<210> SEQ ID NO 360

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 360

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgttagcg gcagcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg	120
cctggcacag cccctaaact gctgtatctac tacgacgacc tgccgtctag cggcgtgcca	180

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gatagattt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag	240
agcgaggacg aggccgacta ttattgtgcc gcctgggacg acagcctgaa cgacatccct	300
gtttttggcg gaggcaccaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgtg	360
accctgttcc ctccaagcagc cgaggaactg caggcaaca aggccacctt cgttgctg	420
atcagcgact tctatcctgg cgccgtgacc gtggcctgga aggccgatag ctctcctgtg	480
aaggccggcg tgaaaaccac cacccttago aagcagagca acaacaata cgccgcagc	540
agctaccta gctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 361

<211> LENGTH: 120

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 361

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr	
20 25 30	
Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	
Ser Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys	
50 55 60	
Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr Leu	
65 70 75 80	
Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala	
85 90 95	
Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln	
100 105 110	
Gly Thr Leu Val Thr Val Ser Ser	
115 120	

<210> SEQ ID NO 362

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 362

Ser Tyr Ala Met Ser	
1 5	

<210> SEQ ID NO 363

<211> LENGTH: 16

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 363

Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly	
1 5 10 15	

<210> SEQ ID NO 364

<211> LENGTH: 12

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<210> SEQ ID NO 369
<211> LENGTH: 360
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 369

```
gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcggtc tctgagactg      60
agctgtgccg ccaggcgctt cacttttac agctacgcca tgagctgggt ccgacaggcc     120
cctggaaaag gccttgaatg ggtgtccgcg atcggctatg gggcgatac ctactacgccc    180
gactctgtga agggcagatt caccatcagc cgggacaaca gcaagaacac cctgtacctg    240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgcacag aaggggacgac   300
tacaccagca gggacgcctt cgattattgg ggccagggca cactggtcac cgtttcttca    360
```

<210> SEQ ID NO 370
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 370

```
agctacgcca tgagc                                         15
```

<210> SEQ ID NO 371
<211> LENGTH: 48
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 371

```
gccccatcgct atggcgccgta tacctactac gccgactctg tgaagggc                         48
```

<210> SEQ ID NO 372
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 372

```
agggacgact acaccagcag ggacgccttc gattat                                         36
```

<210> SEQ ID NO 373
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 373

```
cagtctgttc tgacacagcc tcctagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttagcg gcaggcagctc caacatcgcc agcaacaccc tgaactggta tcagcagctg     120
cctggcacag cccctaaact gctatctac tacgacgacc tggcccttag cggcggtgcca     180
gatagatttt ctggcagcaa gagcggcacc tctgcccggcc tggctatttc tggactgcag    240
agcgaggacg aggccgacta ttattgtgcc gcctgggacg acagcctgaa cgtgatccct    300
```

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gtttttggcg gaggcaccaa gctgaccgtt cta

333

```
<210> SEQ ID NO 374
<211> LENGTH: 39
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 374
```

agcggcagca gctccaacat cggcagcaac accgtgaac

39

```
<210> SEQ ID NO 375
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 375

21

```
<210> SEQ ID NO 376
<211> LENGTH: 36
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 376

<210> SEQ ID NO 377
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 377

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Tyr Ser Tyr
20 25 30

Ala Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Ala Ile Gly Tyr Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys
50 55 60

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

Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys Ala
85 90 95

Arg Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Tyr Trp Gly Gln
 100 105 110

Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly	Pro	Ser	Val
115							120					125			

Phe Pro Leu Ala Pro Cys Ser Arg Ser Thr Ser Glu Ser Thr Ala Ala
130 135 140

Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser
 145 150 155 160

Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val

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165	170	175
Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro		
180	185	190
Ser Ser Ser Leu Gly Thr Lys Thr Tyr Thr Cys Asn Val Asp His Lys		
195	200	205
Pro Ser Asn Thr Lys Val Asp Lys Arg Val Glu Ser Lys Tyr Gly Pro		
210	215	220
Pro Cys Pro Pro Cys Pro Ala Pro Glu Phe Leu Gly Gly Pro Ser Val		
225	230	235
Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr		
245	250	255
Pro Glu Val Thr Cys Val Val Val Asp Val Ser Gln Glu Asp Pro Glu		
260	265	270
Val Gln Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys		
275	280	285
Thr Lys Pro Arg Glu Glu Gln Phe Asn Ser Thr Tyr Arg Val Val Ser		
290	295	300
Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys		
305	310	315
Cys Lys Val Ser Asn Lys Gly Leu Pro Ser Ser Ile Glu Lys Thr Ile		
325	330	335
Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro		
340	345	350
Pro Ser Gln Glu Glu Met Thr Lys Asn Gln Val Ser Leu Thr Cys Leu		
355	360	365
Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn		
370	375	380
Gly Gln Pro Glu Asn Asn Tyr Lys Thr Pro Pro Val Leu Asp Ser		
385	390	395
Asp Gly Ser Phe Phe Leu Tyr Ser Arg Leu Thr Val Asp Lys Ser Arg		
405	410	415
Trp Gln Glu Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu		
420	425	430
His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Leu Gly Lys		
435	440	445

<210> SEQ ID NO 378

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 378

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln		
1	5	10
Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Ile Gly Ser Asn		
20	25	30
Thr Val Asn Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu Leu		
35	40	45
Ile Tyr Tyr Asp Asp Leu Arg Pro Ser Gly Val Pro Asp Arg Phe Ser		
50	55	60
Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu Gln		
65	70	75
Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser Leu		

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85	90	95
Asn Val Ile Pro Val Phe Gly Gly	Gly Thr Lys Leu Thr Val Leu Gly	
100	105	110
Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu		
115	120	125
Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe		
130	135	140
Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val		
145	150	155
Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys		
165	170	175
Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser		
180	185	190
His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu		
195	200	205
Lys Thr Val Ala Pro Thr Glu Cys Ser		
210	215	

<210> SEQ ID NO 379

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 379

gaagttcagc tgctgaaatc tggcgccgga ctgggttcaac ctggcggttc tctgagactg	60
agctgtgcgg ccagcggtt cacctttac agctacgcca tgagctgggt ccgacaggcc	120
cctggaaaag gccttgaatg ggtgtccgco atcggctatg gcggcgatac ctactacgccc	180
gactctgtga agggcagatt caccatcago cgggacaaca gcaagaacac cctgtacctg	240
cagatgaaca gcctgagagc cgaggacacc gccgtgtact attgcgccag aagggacgac	300
tacaccagca gggacgcctt cgattattgg ggccagggca cactggtcac cgtttcttca	360
gccagcacca agggccccag cgtgtccct ctggccctt gtacgacaag caccagcgag	420
tctacagccg ccctgggctg cctctgtaaag gactacttc ccgagccctg gaccgtgtcc	480
tggaaactctg gcgctctgac aagcgccgtg cacaccttc cagccgtgt gcagagcagc	540
ggcctgtact ctctgagcag cgctgtgaca gtgcccagca gcagcctggg caccaagacc	600
taacacctgtta acgtggacca caagcccagc aacaccaagg tggacaaggc ggtggaatct	660
aagtacggcc ctccctgcccc tccttgcccc gccccctgaat ttctggggcc accctccgtg	720
ttccctgttcc ccccaaagcc caaggacacc ctgtatgtac gccggacccc cgaagtgacc	780
tgcgtgggtgg tggatgtgtc ccaggaagat cccgaggtgc agttcaattt gtacgtggac	840
ggcgtggaaag tgcacaacgc caagaccaag cccagagagg aacagtccaa cagcacctac	900
cgggtggtgtt ccgtgtgac agtgcgtcac caggactggc tgaacggcaa agagtacaag	960
tgcaagggtgtt ccaacaaggc cctgcccagc tccatcgaga aaaccatcag caaggccaaag	1020
ggccagcccccc gogaacccccca ggtgtacaca ctgcctccaa gccaggaaaga gatgaccaag	1080
aaccagggtgtt ccctgacactg tctctgtaaa ggcttctacc cctccgatat cgccgtggaa	1140
tgggagagca acggccagcc cgagaacaac tacaagacca cccccctgt gctggacagc	1200
gacggctcat tcttcctgtta cagcagactg accgtggaca agagccggc gcaggaaggc	1260
aacgtgttca gtcgcagcgt gatgcacgag gccctgcaca accactacac ccagaagtcc	1320

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cgtgtctctga gcctgggcaa g 1341

<210> SEQ ID NO 380
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 380

```
cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttagcg cgacgcgactc caacatcgcc agcaacaccc tgaactggta tcagcagctg      120
cctggcacag cccctaaact gctgtatctac tacgacgacc tgccgectag cggcgtgcca      180
gatagatttt ctggcagcaa gagcggcacc tctgccagcc tggctatttc tggactgcag      240
agcgaggacg aggcccacta ttatttgcc gcctgggacg acagcctgaa cgtgatccct      300
gtttttggcg gaggcaccaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgtg      360
acccctgttcc ctccaaaggcag cgaggaactg caggccaaaca aggccaccct cgtgtgcctg      420
atcagcgaact tctatactgg cgccgtgacc gtggcctggaa aggccgatag ctctcctgtg      480
aaggccggcg tggaaaccac cacccttagc aagcagagca acaacaata cgccgcccgc      540
agctacactga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg      600
acccacgagg gcagcaccgt ggaaaagaca gtggcccccta ccgagtgca g 651
```

<210> SEQ ID NO 381
<211> LENGTH: 123
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 381

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1															15

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Asp	Ser	Tyr
															30

Glu	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
															45

Ser	Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val
															60

Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr
65															80

Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
															95

Ala	Arg	Ser	Gly	Tyr	Ser	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
															110

Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser					
															120

<210> SEQ ID NO 382
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 382

-continued

Ser Tyr Glu Met Asn
1 5

<210> SEQ ID NO 383
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 383

Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val Lys
1 5 10 15

Gly

<210> SEQ ID NO 384
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 384

Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
1 5 10

<210> SEQ ID NO 385
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 385

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asp Ile Gly Ala Gly
20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
35 40 45

Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr Ala Gly Pro
85 90 95

Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> SEQ ID NO 386
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 386

Thr Gly Ser Ser Asp Ile Gly Ala Gly Tyr Asp Val His
1 5 10

<210> SEQ ID NO 387
<211> LENGTH: 7
<212> TYPE: PRT

-continued

<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 387

Gly Asn Ser Asn Arg Pro Ser
1 5

<210> SEQ ID NO 388
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 388

Ser Ser Tyr Ala Gly Pro Asn Pro Tyr Val Val
1 5 10

<210> SEQ ID NO 389
<211> LENGTH: 369
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 389

gaagttcagc tgctgaaatc tggcgccgga ctgggttcaac ctggcggttc tctgagactg	60
agctgtgccg ccaggcgctt cacttcgat agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccggc atcagctgga atagcggctg gatcgactac	180
gccgacagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcggtg actactgtgc cagaaggccc	300
tacagcagct cttggtttga ccccgacttc gactattggg gccagggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 390
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 390

agctacgaga tgaac	15
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<210> SEQ ID NO 391
<211> LENGTH: 51
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 391

ggcatcagct ggaatagcggtt ctggatcgac tacgcccaca gcgtgaaggg c	51
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<210> SEQ ID NO 392
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 392

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agcggctaca gcagctttt gtttacccca gacttcgact at	42
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<210> SEQ ID NO 393
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 393

cagtctgttc tgacacagcc tccatctgtt tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc cgatattggc gccggatacg acgtgcactg gtatcagcaa	120
ctgcctggca cagccccctaa gctgtgtatc tacggcaaca gcaacagacc tagcggcgtg	180
cccgatagat tcageggctc taagtctggc acaagcgcca gcctggccat tactggactg	240
caggccgaag atgaggccga ctactactgc agcagctacg ctggcccaa tccttacgtg	300
gtgtttggcg gcggaaacaaa gctgaccgtt cta	333

<210> SEQ ID NO 394
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 394

acaggcagca gctccgatat tggcgccgga tacgacgtc ac	42
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<210> SEQ ID NO 395
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 395

ggcaacagca acagacatcg c	21
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<210> SEQ ID NO 396
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 396

agcagctacg ctggcccaa tccttacgtg gtg	33
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<210> SEQ ID NO 397
<211> LENGTH: 453
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 397

Glu Val Gln Leu Leu Glu Ser Gly Gly Leu Val Gln Pro Gly Gly			
1	5	10	15
10	15		

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asp Ser Tyr			
20	25	30	
30			

Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val			
35	40	45	
45			

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Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val
 50 55 60
 Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
 65 70 75 80
 Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 100 105 110
 Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
 115 120 125
 Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
 130 135 140
 Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
 145 150 155 160
 Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
 165 170 175
 Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
 180 185 190
 Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
 195 200 205
 Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
 210 215 220
 Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 225 230 235 240
 Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 245 250 255
 Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 260 265 270
 Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 275 280 285
 Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 290 295 300
 Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 305 310 315 320
 Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 325 330 335
 Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 340 345 350
 Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
 355 360 365
 Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
 370 375 380
 Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
 385 390 395 400
 Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 405 410 415
 Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 420 425 430
 Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 435 440 445
 Leu Ser Pro Gly Lys
 450

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<210> SEQ ID NO 398
<211> LENGTH: 217
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 398

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1					5				10				15		

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asp	Ile	Gly	Ala	Gly
					20			25				30			

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
					35			40			45				

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
				50		55			60						

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Thr	Gly	Leu
				65		70		75				80			

Gln	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ser	Ser	Tyr	Ala	Gly	Pro
					85			90			95				

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly	
				100		105			110						

Gln	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	Glu
				115		120			125						

Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	Phe
				130		135			140						

Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	Val
				145		150			155			160			

Lys	Ala	Gly	Val	Glu	Thr	Thr	Pro	Ser	Lys	Gln	Ser	Asn	Asn	Lys	
				165		170			175						

Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	Ser
				180		185			190						

His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	Glu
				195		200			205						

Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser						
				210		215								

<210> SEQ ID NO 399
<211> LENGTH: 1359
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 399

gaagttcagc	tgttggaaatc	tggcgccgga	ctgggtcaac	ctggcgatc	tctgagactg	60
agctgtgcgg	ccagcggtt	cacccatcgat	agctacgaga	tgaactgggt	ccgacaggcc	120
cctggcaag	gccttgaatg	ggtgtccggc	atcagctgga	atagcggttg	gatcgactac	180
gccgacagcg	tgaagggcag	attcaccatc	agccgggaca	acagcaagaa	caccctgtac	240
ctgcagatga	acagcctgag	agccgaggac	accggcgatgt	actactgtgc	cagaagcgac	300
tacagcagct	cttggtttga	ccccgacttc	gactattggg	gccagggcac	actggtcaca	360
gtctcttcag	ccagcaccaa	ggggccccc	gtgttccctc	tggcccttag	cagcaagagc	420
acatctggcg	gaacagccgc	cctgggtctgc	ctcgtgaagg	actactttcc	cgagcccgat	480
accgtgttct	ggaactctgg	cgctctgaca	agccggcgtgc	acaccttcc	agccgtgtct	540

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cagagcagcg gcctgtactc tctgaggcago gtcgtgacag tgcccagcag ctctctggc	600
acccagacct acatctgcaa cgtgaaccac aagcccagca acaccaaggt ggacaagaag	660
gtgaaaccca agagctgcga caagacccac acctgtcccc cttgtctgc ccccgaactg	720
ctgggaggcc cttccgtgtt cctgtcccc ccaaagccca aggacaccct gatgtcagc	780
cggaccccg aagtgacctg cgtgggtgtg gatgtgtccc acgaggaccc tgaagtgaag	840
ttcaatttgt acgtggacgg cgtggaaatg cacaacgcga agaccaagcc tagagaggaa	900
cagtacaaca gcacctaccg ggtgggtgtc gtgctgacag tgctgacca ggactggctg	960
aacggcaaaag agtacaatgt caagggtgtc aacaaggccc tgcctgcacc catcgagaaa	1020
accatcagca aggccaagggg ccagccccgc gaaccccgagg tgtacacact gcccccaagc	1080
agggacgacg tgaccaagaa ccagggtgtcc ctgacacctg tcgtgaaagg cttctacccc	1140
tccgatatacg ccgtggaaatg ggagagcaac ggccagcccc agaacaacta caagaccacc	1200
ccccctgtgc tggacagcga cggctcatc ttctgtaca gcaagctgac cgtggacaag	1260
tcccggtggc agcagggcaa cgtgttcago tgcagcgtga tgcacgaggc cctgcacaac	1320
cactacaccc agaagtccct gagectgago cctggcaag	1359

<210> SEQ ID NO 400

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 400

cagtctgttc tgacacagcc tccatctgtc tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc cgatattggc gccggatacg acgtgcactg gtatcagcaa	120
ctgcctggca cagccctaa gctgtgatc tacggcaaca gcaacagacc tagccgcgt	180
cccgatagat tcagcggctc taagtctggc acaagcgcca gcctggccat tactggactg	240
caggccgaag atgaggccga ctactactgc agcagctacg ctggcccaa tccttacgt	300
gtgtttggcg gcgaaacaaa gctgaccgtt cttaggccagc ctaaagccgc ccctagcgt	360
accctgttcc ctccaaagcag cgaggaactg caggccaaaca aggccaccct cgttgctg	420
atcagcgact tctatctgg cgccgtgacc gtggcctgga aggccgatag ctctctgt	480
aaggccggcg tggaaaccac cacccttagc aagcagagca acaacaata cgccgccagc	540
agctacctga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagt	600
acccacgagg gcagcacccgt ggaaaagaca gtggccctca ccgagtgcag c	651

<210> SEQ ID NO 401

<211> LENGTH: 123

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 401

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asp Ser Tyr	
20 25 30	

Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	

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Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val
 50 55 60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> SEQ ID NO 402

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 402

Ser Tyr Glu Met Asn
 1 5

<210> SEQ ID NO 403

<211> LENGTH: 17

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 403

Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val Lys
 1 5 10 15

Gly

<210> SEQ ID NO 404

<211> LENGTH: 14

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 404

Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 1 5 10

<210> SEQ ID NO 405

<211> LENGTH: 111

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 405

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly
 20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
 35 40 45

Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
 50 55 60

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Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Ala Gly Ile
85 90 95

Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> SEQ ID NO 406

<211> LENGTH: 14

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 406

Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly Tyr Asp Val His
1 5 10

<210> SEQ ID NO 407

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 407

Gly Asn Ser Asn Arg Pro Ser
1 5

<210> SEQ ID NO 408

<211> LENGTH: 11

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 408

Gln Ser Tyr Ala Gly Ile Asn Pro Tyr Val Val
1 5 10

<210> SEQ ID NO 409

<211> LENGTH: 369

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 409

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggctt caccttcgtat agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccggc atcagctggta atagcggctg gatcgactac	180
gccgacacgcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcgatc actactgtgc cagaaggccc	300
tacagcagct cttgggttga ccccgacttc gactattggg gccagggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 410

<211> LENGTH: 15

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

-continued

<400> SEQUENCE: 410

agctacgaga tgaac

15

<210> SEQ ID NO 411

<211> LENGTH: 51

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 411

ggcatcagct ggaatagcggt ctggatcgac tacgcccaca gcgtgaaggg c

51

<210> SEQ ID NO 412

<211> LENGTH: 42

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 412

agcggctaca gcagcttgc gtttgacccc gacttcgact at

42

<210> SEQ ID NO 413

<211> LENGTH: 333

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 413

cagtctgttc tgacacagcc tccatctgtc tctggcgccc ctggacagag agtgaccatc

60

agctgtacag gcagcagctc caatatcgga gccggctatg acgtgcactg gtatcaggcg

120

ctgcctggca cagccccctaa actgtgtatc tacggcaaca gcaacagacc cagcggcgtg

180

cccgatagat ttccggctc taagagcggt acaagcgcca gcctggctat tactggactg

240

caggcccagg acgaggccga ctactactgt cagagctacg ccggcatcaa cccctacgtg

300

gtgtttggcg gaggcaccaa gctgacagtt cta

333

<210> SEQ ID NO 414

<211> LENGTH: 42

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 414

acaggcagca gtcataatcg cggagccggc tatgacgtgc ac

42

<210> SEQ ID NO 415

<211> LENGTH: 21

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 415

ggcaacagca acagacccag c

21

<210> SEQ ID NO 416

<211> LENGTH: 33

<212> TYPE: DNA

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<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 416

cagagctacg ccggcatcaa cccctacgtg gtg

33

<210> SEQ ID NO 417
<211> LENGTH: 453
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 417

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1															
							5				10				15

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Asp	Ser	Tyr
							20			25				30	

Glu	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
							35			40				45	

Ser	Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val
							50			55				60	

Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr
							65			70				80	

Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
							85			90				95	

Ala	Arg	Ser	Gly	Tyr	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr	
							100			105				110	

Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly
							115			120				125	

Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly
							130			135				140	

Thr	Ala	Ala	Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val
							145			150				160	

Thr	Val	Ser	Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe
							165			170				175	

Pro	Ala	Val	Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val
							180			185				190	

Thr	Val	Pro	Ser	Ser	Leu	Gly	Thr	Gln	Thr	Tyr	Ile	Cys	Asn	Val	
							195			200				205	

Asn	His	Lys	Pro	Ser	Asn	Thr	Lys	Val	Asp	Lys	Lys	Val	Glu	Pro	Lys
							210			215				220	

Ser	Cys	Asp	Lys	Thr	His	Thr	Cys	Pro	Pro	Cys	Pro	Ala	Pro	Glu	Leu
							225			230				240	

Leu	Gly	Gly	Pro	Ser	Val	Phe	Leu	Phe	Pro	Pro	Lys	Pro	Lys	Asp	Thr
							245			250				255	

Leu	Met	Ile	Ser	Arg	Thr	Pro	Glu	Val	Thr	Cys	Val	Val	Val	Asp	Val
							260			265				270	

Ser	His	Glu	Asp	Pro	Glu	Val	Lys	Phe	Asn	Trp	Tyr	Val	Asp	Gly	Val
							275			280				285	

Glu	Val	His	Asn	Ala	Lys	Thr	Lys	Pro	Arg	Glu	Glu	Gln	Tyr	Asn	Ser
							290			295				300	

Thr	Tyr	Arg	Val	Val	Ser	Val	Leu	Thr	Val	Leu	His	Gln	Asp	Trp	Leu
							305			310				315	

Asn	Gly	Lys	Glu	Tyr	Lys	Cys	Lys	Va	Ser	Asn	Lys	Ala	Leu	Pro	Ala
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325	330	335
Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro		
340	345	350
Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln		
355	360	365
Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala		
370	375	380
Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr		
385	390	395
400	405	415
Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu		
415	420	425
Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser		
425	430	435
Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser		
435	440	445
Leu Ser Pro Gly Lys		
450		

<210> SEQ ID NO 418

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 418

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln		
1	5	10
15		
Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly		
20	25	30
Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu		
35	40	45
Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe		
50	55	60
Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu		
65	70	75
80		
Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Ala Gly Ile		
85	90	95
Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly		
100	105	110
Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu		
115	120	125
Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe		
130	135	140
Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val		
145	150	155
160		
Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys		
165	170	175
Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser		
180	185	190
His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu		
195	200	205
Lys Thr Val Ala Pro Thr Glu Cys Ser		
210	215	

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<210> SEQ ID NO 419
<211> LENGTH: 1359
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 419

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt cacatcgat agtacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccgga atcagctgga atagcggtg gatcgactac	180
gccgacacgcg tgaaggcag attcaccatc agetcgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accgcgtgt actactgtc cagaagcggc	300
tacagcagct cttgggttga ccccgacttc gactattggg gccaggcac actggtcaca	360
gtctcttcag ccagcaccaa gggccccagc gtgttccctc tggcccctag cagcaagagc	420
acatctggcg gaacagccgc cctgggctgc ctctgtgagg actactttcc cgagccccgt	480
accgtgttctt ggaactctgg cgctctgaca aegggcgatc acacctttcc agccgtgt	540
cagagcagcg ccgttactc tctgagcago gtctgtgacag tgcccgacag ctctctggc	600
acccagacct acatctgaa cgtgaaccac aagccccagca acaccaaggt ggacaagaag	660
gtggaaaccctt agagctgcga caagacccac acctgtcccc cttgttctgc ccccgaaactg	720
ctggggaggcc cttccgtgtt cctgttcccc ccaaagccca aggacaccct gatgtcagc	780
cgccggccggc aagtgttctg cgtgggtggt gatgtgtccc acgaggaccc tgaagtgaag	840
ttcaatttgtt acgtggacgg cgtggaaagtg cacaacgcca agaccaagcc tagagaggaa	900
cagtacaaca gcaccttaccg ggtgtgttcc gtgtgtgacag tgctgcacca ggactggct	960
aacggcaaag agtacaagtg caaggtgtcc aacaaggccc tgctgccttcc catcgagaaa	1020
accatcagca aggccaaagg ccagccccgc gaacccccagg tgtacacact gcccccaagc	1080
aggggacgacg tcaccaagaa ccagggtgtcc ctgacacgtc tcgtgaaagg cttctacccc	1140
tccgatatacg ccgtggaaatg ggagagcaac ggcacccggc agaacaacta caagaccacc	1200
ccccctgtgc tggacagcga cggctcatc ttctgtaca gcaagctgac cgtggacaag	1260
tcccggtggc agcaggccaa cgtgttcago tgcacgcgtg tgcacgaggc cctgcacaaac	1320
cactacaccc agaagtccct gagectgago cctggcaag	1359
cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc caatatcgga gccggctatg acgtgcactg gtatcagcag	120
ctgcctggca cagccctaa actgtgtatc tacggcaaca gcaacacgacc cagcgccgt	180
cccgatagat ttccggctc taagagcgcc acaagcgcca gcctggctat tactggactg	240
caggccgagg acgaggccga ctactactgt cagagctacg ccggcatcaa cccctacgt	300
gtgtttggcg gaggcaccaa gctgacagtt cttaggcacg ctaaagccgc ccctagcgt	360
accctgttcc ctccaaggcag cgaggaactg caggccaaca aggccaccct cgtgtgcctg	420

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atcagcgact tctatcctgg cgccgtgacc gtggcctgga aggccgatag ctctcctgtg	480
aaggccggcg tggaaaccac cacccttago aagcagagca acaacaata cgccgccagc	540
agctacctga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 421

<211> LENGTH: 123

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 421

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly			
1	5	10	15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Ser Tyr			
20	25	30	

Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val			
35	40	45	

Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Gly Tyr Ala Asp Ser Val			
50	55	60	

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys			
85	90	95	

Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr			
100	105	110	

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser		
115	120	

<210> SEQ ID NO 422

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 422

Ser Tyr Glu Met Asn		
1	5	

<210> SEQ ID NO 423	
<211> LENGTH: 17	
<212> TYPE: PRT	
<213> ORGANISM: Artificial Sequence	
<220> FEATURE:	
<223> OTHER INFORMATION: antibody sequence	

<400> SEQUENCE: 423

Gly Ile Ser Trp Asn Ser Gly Trp Ile Gly Tyr Ala Asp Ser Val Lys			
1	5	10	15

Gly

<210> SEQ ID NO 424

<211> LENGTH: 14

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 424

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Ser Gly Tyr Ser Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 1 5 10

<210> SEQ ID NO 425
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 425

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1					5				10						15

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly
			20					25				30			

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
			35					40				45			

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
				50				55				60			

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Thr	Gly	Leu
65				70				75				80			

Gln	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Gln	Ser	Tyr	Ala	Gly	Pro
		85				90			95						

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu		
			100				105				110				

<210> SEQ ID NO 426
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 426

Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly	Tyr	Asp	Val	His
1					5				10				

<210> SEQ ID NO 427
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 427

Gly	Asn	Ser	Asn	Arg	Pro	Ser
1					5	

<210> SEQ ID NO 428
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 428

Gln	Ser	Tyr	Ala	Gly	Pro	Asn	Pro	Tyr	Val	Val
1					5			10		

<210> SEQ ID NO 429
<211> LENGTH: 369
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence

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<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 429

gaagttcagc tgctggaaatc tggccgcgga ctgggtcaac ctggccggatc tctgagactg
agctgtgccg ccagcggtt cgatttcagc agctacgaga tgaactgggt ccgcacaggcc 120
cctggcaaaag gccttgaatg ggtgtccggc atcagctggaa atagccggctg gatccggctac
gccgatagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac 240
ctgcagatga acagcgctgag agccgaggac accggccgtgt actactgtgc cagaagccgc
tacagcagct cttggtttga cccccacttc gactattggg gccagggcac actggtcaca
gtctcttca 360

<210> SEQ ID NO 430
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 430

agctacgaga tgaac 15

<210> SEQ ID NO 431
<211> LENGTH: 51
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 431

ggcatcagct ggaatagccg ctggatccgc tacggccata gcgtgaaggg c 51

<210> SEQ ID NO 432
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 432

agcggctaca gcagctcttg gtttgacccc gacttcgact at 42

<210> SEQ ID NO 433
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 433

cagtctgttc tgacacagcc tccatctgtg tctggccccc ctggacagag agtgaccatc
agctgtacag gcagcagctc caaatccggaa gcccggatcg acgtgcactg gtatcagcag 120
ctgcctggca cagccccctaa actgctgatc tacggcaaca gcaacagacc cagccggctg
cccgatagat tttccggctc taagagccgc acaaggcaca gcctggctat tactggactg 180
caggccgagg acgaggccga ctactactgt cagtcttacg ctggcccaa tccttacgtg
gtgtttggcg gcggaaacaaa gctgaccgtt cta 240
333

<210> SEQ ID NO 434

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<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 434

acaggcagca gtcataatcgccggc tatgacgtgc ac

42

<210> SEQ ID NO 435
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 435

ggcaacagca acagacccag c

21

<210> SEQ ID NO 436
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 436

cagtcttacg ctggcccaa tccttacgtg gtg

33

<210> SEQ ID NO 437
<211> LENGTH: 453
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 437

Glu Val Gln Leu Leu Glu Ser Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Ser Tyr
20 25 30Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Gly Tyr Ala Asp Ser Val
50 55 60Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100 105 110Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

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Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
 195 200 205
 Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
 210 215 220
 Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 225 230 235 240
 Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 245 250 255
 Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 260 265 270
 Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 275 280 285
 Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 290 295 300
 Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 305 310 315 320
 Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 325 330 335
 Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 340 345 350
 Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
 355 360 365
 Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
 370 375 380
 Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
 385 390 395 400
 Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 405 410 415
 Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 420 425 430
 Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 435 440 445
 Leu Ser Pro Gly Lys
 450

<210> SEQ ID NO 438
 <211> LENGTH: 217
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 438

 Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
 1 5 10 15

 Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly
 20 25 30

 Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
 35 40 45

 Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
 50 55 60

 Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
 65 70 75 80

 Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Ala Gly Pro
 85 90 95

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Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
 100 105 110
 Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
 115 120 125
 Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
 130 135 140
 Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
 145 150 155 160
 Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
 165 170 175
 Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
 180 185 190
 His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
 195 200 205
 Lys Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> SEQ ID NO 439
 <211> LENGTH: 1359
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 439

gaagttcagc tgctggaaatc tggcgccgga ctggttcaac ctggcggtatc tctgagactg	60
agctgtgcgc ccagcggctt cgatttcago agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaaag gccttgaatg ggtgtccggc atcagctggaa atagcggctg gatcggctac	180
gccgatagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcgtgt actactgtgc cagaagccgc	300
tacagcagct cttggtttga cccccacttc gactattggg gccagggcac actggtcaca	360
gtctcttcag ccagcaccaa ggcccccago gtgttccctc tggcccttag cagcaagagc	420
acatctggcg gaacagccgc cctgggctgc ctctgtgaaagg actactttcc cgagccctg	480
accgtgtctt ggaactctgg cgctctgaca ageggcgtgc acaccttcc agccgtgtg	540
cagagcagcg gcctgtactc tctgagcago gtctgtacag tgcccagcag ctctctggc	600
acccagaccc acatctgcaa cgtgaaccac aagcccagca acaccaaggt ggacaagaag	660
gtggaaaccca agagctgcga caagacccac acctgtcccc cttgtcttc cccccaaactg	720
ctggggggcc cttccgtgtt cctgttcccc ccaaagccca aggacaccct gatgtcagc	780
cggacccccc aagtgtaccc cggtgggtgt gatgtgtccc acgaggaccc tgaagtgaag	840
ttcaatttgtt acgtggacgg cgtggaaagtgc cacaacgcca agaccaagcc tagagaggaa	900
cagtacaaca gcacctaccg ggtgggtgtcc gtgtgtacag tgctgcacca ggactggctg	960
aacggcaaag agtacaagtgc caaggtgtcc aacaaggccc tgcctgcccc catcgagaaa	1020
accatcagca aggccaaaggcc ccagccccgc gaaccccccagg tgtacacact gcccccaagc	1080
agggacgagc tgaccaagaa ccagggtgtcc ctgacccgtc tcgtgaaagg cttctacccc	1140
tccgatatacg ccgtggaaatg ggagagcaac ggccagcccc agaacaacta caagaccacc	1200
ccccctgtgc tggacagcga cggctcatc ttccctgtaca gcaagctgac cgtggacaag	1260
tcccggtggc agcagggcaa cgtgttcagc tgcagcgtga tgcacgaggc cctgcacaac	1320

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cactacaccc agaagtccct gagcctgago cctggcaag

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<210> SEQ ID NO 440
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 440

```
cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc      60
agctgtacag gcagcagctc caaatcgga gccggctatg acgtgcactg gtatcagcag      120
ctgcctggca cagccccctaa actgctgatc tacggcaaca gcaacagacc cagcggcgtg      180
cccatacatat ttccggctc taagagcggc acaagcggca gcctggctat tactggactg      240
caggccgagg acgaggccga ctactactgt cagtcttacg ctggcccaa tccttacgtg      300
gtgtttggcg gcggaacaaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgtg      360
accctgttcc ctccaaggcag cgaggaaactg cagggcaaca aggccacct ctgtgtcctg      420
atcagcgact tctatcctgg cgccgtgacc gtggcctgga aggccgatag ctctcctgtg      480
aaggccggcg tggaaaccac cacccctago aagcagagca acaacaata cgccgcccgc      540
agctacactga gcctgaccccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg      600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c      651
```

<210> SEQ ID NO 441
<211> LENGTH: 123
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 441

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Ley	Val	Gln	Pro	Gly	Gly
1														15

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Asp	Phe	Ser	Ser	Tyr
															30

Glu	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Ley	Glu	Trp	Val
35															

Ser	Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val
50															60

Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Ley	Tyr
65															80

Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
85															95

Ala	Arg	Ser	Gly	Tyr	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
100														

Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser
115										

<210> SEQ ID NO 442
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 442

Ser Tyr Glu Met Asn

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1 5

<210> SEQ ID NO 443
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 443

Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val	Lys
1															15

Gly

<210> SEQ ID NO 444
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 444

Ser	Gly	Tyr	Ser	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
1													10

<210> SEQ ID NO 445
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 445

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1															15

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly
20															30

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
35															45

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
50															60

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Thr	Gly	Leu
65															80

Gln	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Gln	Ser	Tyr	Ala	Gly	Pro
85															95

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	
100														110

<210> SEQ ID NO 446
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 446

Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly	Tyr	Asp	Val	His
1													10

<210> SEQ ID NO 447
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence

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<220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 447

Gly Asn Ser Asn Arg Pro Ser
 1 5

<210> SEQ ID NO 448
 <211> LENGTH: 11
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 448

Gln Ser Tyr Ala Gly Pro Asn Pro Tyr Val Val
 1 5 10

<210> SEQ ID NO 449
 <211> LENGTH: 369
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 449

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgccg ccagcggtt cgatttcago agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccggt atcaatggaa atagcggtcg gatcgactac	180
ggccgacagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcgatg actactgtgc cagaaggccc	300
tacagcagct cttggtttga ccccgacttc gactattggg gccagggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 450
 <211> LENGTH: 15
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 450

agctacgaga tgaac	15
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<210> SEQ ID NO 451
 <211> LENGTH: 51
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 451

ggcatcagct ggaatagcgg ctggatcgac tacgcccaca gcgtgaaggg c	51
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<210> SEQ ID NO 452
 <211> LENGTH: 42
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 452

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agcggctaca gcagctttg gtttgacccc gacttcgact at	42
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<210> SEQ ID NO 453
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 453

cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc caaatcgga gccggctatg acgtgcactg gtatcagcag	120
ctgcctggca cagcccccaa actgctgatc tacggcaaca gcaacagacc cagcggcgtg	180
cccgatagat ttccggctc taagagcggc acaagcggca gcctggctat tactggactg	240
caggccgagg acgaggccga ctactactgt cagtcttacg ctggcccaa tccttacgtg	300
gtgtttggcg gcggAACAAA gctgaccgtt cta	333

<210> SEQ ID NO 454
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 454

acaggcagca gctccaatat cggagccggc tatgacgtgc ac	42
--	----

<210> SEQ ID NO 455
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 455

ggcaacagca acagacccag c	21
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<210> SEQ ID NO 456
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 456

cagtcttacg ctggcccaa tccttacgtg gtg	33
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<210> SEQ ID NO 457
<211> LENGTH: 453
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 457

Glu Val Gln Leu Leu Glu Ser Gly Gly Leu Val Gln Pro Gly Gly	
1	5
	10
	15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Ser Tyr	
20	25
	30

Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35	40
	45

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Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val
 50 55 60
 Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
 65 70 75 80
 Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 100 105 110
 Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
 115 120 125
 Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
 130 135 140
 Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
 145 150 155 160
 Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
 165 170 175
 Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
 180 185 190
 Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
 195 200 205
 Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
 210 215 220
 Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 225 230 235 240
 Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 245 250 255
 Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 260 265 270
 Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 275 280 285
 Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 290 295 300
 Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 305 310 315 320
 Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 325 330 335
 Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 340 345 350
 Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
 355 360 365
 Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
 370 375 380
 Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
 385 390 395 400
 Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 405 410 415
 Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 420 425 430
 Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 435 440 445
 Leu Ser Pro Gly Lys
 450

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<210> SEQ ID NO 458

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 458

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1															
									5	10				15	

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly
									20	25				30	

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
									35	40				45	

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
									50	55				60	

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Thr	Gly	Leu
									65	70				80	

Gln	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Gln	Ser	Tyr	Ala	Gly	Pro
									85	90				95	

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly	
									100	105				110	

Gln	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	Glu
									115	120				125	

Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	Phe
									130	135				140	

Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	Val
									145	150				160	

Lys	Ala	Gly	Val	Glu	Thr	Thr	Pro	Ser	Lys	Gln	Ser	Asn	Asn	Lys	
									165	170				175	

Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	Ser
									180	185				190	

His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	Glu
									195	200				205	

Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser

<210> SEQ ID NO 459

<211> LENGTH: 1359

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 459

gaagttcagc	tgctgaaatc	tggcgccgga	ctgggtcaac	ctggcggttc	tctgagactg		60
------------	------------	------------	------------	------------	------------	--	----

agctgtgcgc	ccagcggctt	cgatttcago	agctacgaga	tgaactgggt	ccgacaggcc		120
------------	------------	------------	------------	------------	------------	--	-----

cctggcaaag	gccttgaatg	ggtgtccggc	atcagctgga	atagcggctg	gatcgactac		180
------------	------------	------------	------------	------------	------------	--	-----

gccgacagcg	tgaagggcag	attcaccatc	agccgggaca	acagcaagaa	caccctgtac		240
------------	------------	------------	------------	------------	------------	--	-----

ctgcagatga	acagcctgag	agccgaggac	accggcggt	actactgtgc	cagaagcgcc		300
------------	------------	------------	-----------	------------	------------	--	-----

tacagcagct	cttgggttga	ccccgacttc	gactattggg	gccagggcac	actggtcaca		360
------------	------------	------------	------------	------------	------------	--	-----

gtctcttcag	ccagcaccaa	ggggcccaga	gtgttccctc	tggcccttag	cagcaagagc		420
------------	------------	------------	------------	------------	------------	--	-----

acatctggcg	gaacagccgc	cctgggctgc	ctcgtgaagg	actacttcc	cgagccctg		480
------------	------------	------------	------------	-----------	-----------	--	-----

accgtgtctt	ggaactctgg	cgctctgaca	agccggcgtgc	acacctttcc	agccgtgtct		540
------------	------------	------------	-------------	------------	------------	--	-----

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cagagcagcg	gcctgtactc	tctgagcagc	gtcgtacag	tgcccagcg	ctctctggc	600
accaggacct	acatctgcaa	cgtgaaccac	aagcccaagca	acaccaaggt	ggacaagaag	660
gtggaaacca	agagctgca	caagaccac	acctgtcccc	cttgtcttcg	ccccgaaactg	720
ctggggaggcc	cttccgtgtt	cctgttcccc	ccaaagccca	aggacaccct	gatgatcage	780
cg�acccccc	aagtgacctg	cgtggtggtg	gatgtgtccc	acgaggaccc	tgaagtgaag	840
ttcaatttgt	acgtggacgg	cgtggaaagt	cacaacgcca	agaccaagcc	tagagaggaa	900
cagtacaaca	gcacacctacc	ggtgtgtcc	gtgctgacag	tgctgcacca	ggactggctg	960
aacggcggaa	agtacaagtg	caagggtgtcc	aacaaggccc	tgcctgc	ccatcgagaaa	1020
accatcagca	aggccaaggg	ccagccccgc	gaaccccagg	tgtacacact	gcccccaagc	1080
agggacgacg	tgaccaagaa	ccagggtgtcc	ctgacacctgc	tcgtgaaagg	cttctaccc	1140
tccgatatacg	ccgtggaaatg	ggagagcaac	ggccagcccc	agaacaacta	caagaccacc	1200
ccccctgtgc	tggacagcga	cggctcatc	ttctctgtaca	gcaagctgac	cgtggacaag	1260
tcccggtggc	agcagggcaa	cgtgttcagc	tgcagcgtga	tgcacgaggc	cctgcacaac	1320
cactacaccc	agaagtccct	gaggcttaac	cctggacaa			1359

<210> SEQ ID NO 460
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 460

cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc 60
agctgtacag gcagcagctc caatatcgga gccggctatg acgtgcactg gtatcagcag 120
ctgcctggca cagccccctaa actgtgtatc tacggcaaca gcaacagacc cagccggctg 180
cccgatagat ttccggctc taagagccgc acaaggcaca gcttggctat tactggactg 240
caggccgagg acgaggccga ctactactgt cagtcttacg ctggcccca tccttacgtg 300
gtgtttggcg gcggAACaaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgtg 360
accctgttcc ctccaaagcag cgaggaaactg caggccaaaca aggccaccct cgtgtgcctg 420
atcagegact tctatcctgg cgccgtgacc gtggccctgga aggccgatag ctctctgtg 480
aaggccggcg tggAAaccac cacccttagc aagcagagca acaacaaaata cgcccccagc 540
agctaacctga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg 600
acccacgagg gcagcacccgt ggAAAAGACA gtggccctaa ccgagtcgcag c 651

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<210> SEQ ID NO 461
<211> LENGTH: 123
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 461
```

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asp Ser Tyr
20 25 30

Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

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Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val
 50 55 60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> SEQ ID NO 462

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 462

Ser Tyr Glu Met Asn
 1 5

<210> SEQ ID NO 463

<211> LENGTH: 17

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 463

Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val Lys
 1 5 10 15

Gly

<210> SEQ ID NO 464

<211> LENGTH: 14

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 464

Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 1 5 10

<210> SEQ ID NO 465

<211> LENGTH: 111

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 465

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly
 20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
 35 40 45

Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
 50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu

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65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Ala Gly Pro
85 90 95Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

<210> SEQ ID NO 466

<211> LENGTH: 14

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 466

Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly Tyr Asp Val His
1 5 10

<210> SEQ ID NO 467

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 467

Gly Asn Ser Asn Arg Pro Ser
1 5

<210> SEQ ID NO 468

<211> LENGTH: 11

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 468

Gln Ser Tyr Ala Gly Pro Asn Pro Tyr Val Val
1 5 10

<210> SEQ ID NO 469

<211> LENGTH: 369

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 469

gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcggtc tctgagactg	60
agctgtgccg ccagcggtt caccttcgtat agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccggc atcagctgga atagcggtcg gatecgactac	180
gccgacagcg tgaagggcag attcaccatc agccggacaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accgcccgtgt actactgtgc cagaagcgac	300
tacagcagct cttggtttga cccccacttc gactattggg gccagggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 470

<211> LENGTH: 15

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 470

agctacgaga tgaac

15

<210> SEQ ID NO 471

<211> LENGTH: 51

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 471

ggcatcagct ggaatagcggt ctggatcgac tacgccgaca gcgtgaaggg c

51

<210> SEQ ID NO 472

<211> LENGTH: 42

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 472

agcggctaca gcagctcttg gtttgacccc gacttcgact at

42

<210> SEQ ID NO 473

<211> LENGTH: 333

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 473

cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtaccatc

60

agctgtacag gcagcagctc caaatatcgga gccggctatg acgtgcactg gtatcagcag

120

ctgcctggca cagccccataa actgctgatc tacggcaaca gcaacagacc cagcggcgtg

180

cccgatagat ttccggctc taagagcggt acaagcgcca gcctggctat tactggactg

240

caggccgagg acgaggccga ctactactgt cagtcttacg ctggcccaa tccttacgtg

300

gtgtttggcg gcggaaacaaa gctgaccgtt cta

333

<210> SEQ ID NO 474

<211> LENGTH: 42

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 474

acaggccgca gctccaatat cgaggccggt tatgacgtgc ac

42

<210> SEQ ID NO 475

<211> LENGTH: 21

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 475

ggcaacagca acagacccag c

21

<210> SEQ ID NO 476

<211> LENGTH: 33

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

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<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 476

cagtcttacg ctggcccaa tccttacgtg gtg

33

<210> SEQ_ID NO 477

<211> LENGTH: 453

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 477

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asp Ser Tyr
20 25 30Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val
50 55 60Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100 105 110Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Asp Val
260 265 270Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

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Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> SEQ ID NO 478

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 478

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly
20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
35 40 45

Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Ala Gly Pro
85 90 95

Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105 110

Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
115 120 125

Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
130 135 140

Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
145 150 155 160

Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
165 170 175

Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
180 185 190

His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
195 200 205

Lys Thr Val Ala Pro Thr Glu Cys Ser
210 215

<210> SEQ ID NO 479

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<211> LENGTH: 1359
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 479

```

gaagttcagc tgctgaaatc tggggcgga ctgggtcaac ctggcgatc tctgagactg      60
agctgtgcgc ccageggctt cacccatcgat agctacgaga tgaactgggt ccgacaggcc     120
cctggcaaag gccttgaatg ggtgtccggc atcagctgga atagcggctg gatcgactac     180
ggcgacacgc tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac     240
ctgcagatga acagcctgag agccgaggac accggcgtgt actactgtgc cagaagccgc     300
tacagcagct cttggtttga ccccgacttc gactattggg gccaggcac actggtcaca     360
gtctcttcag ccagcaccaa gggccccago gtgttccctc tggcccttag cagcaagagc     420
acatctggcg gaacagccgc cctgggctgc ctcgtgaagg actactttcc cgagccctgt     480
accgtgtctt ggaactctgg cgctctgaca agccggcgtgc acacccccc agccgtgtg     540
cagagcagcg gcctgtactc tctgagcago gtcgtgacag tgcccagcag ctctctggc     600
acccagacct acatctgcaa cgtgaaccac aagcccagca acaccaaggt ggacaagaag     660
gtggaacccca agagctgcga caagacccac acctgtcccc cttgtccctgc ccccgaactg     720
ctggggaggcc cttccgtgtt cctgttcccc ccaaagccca aggacaccct gatgtcagc     780
cggacccccc aagtgacctg cgtgggtggt gatgtgtccc acgaggaccc tgaagtgaag     840
ttcaatttgtt acgtggacgg cgtggaaatg cacaacgcca agaccaagcc tagagaggaa     900
cagtacaaca gcacacctaccg ggtgggtgtcc gtgctgacag tgctgcacca ggactggctg     960
aacggcaaaag agtacaagtg caagggtgtcc aacaaggccc tgcctgcccc catcgagaaa   1020
accatcagca aggccaaggg ccagccccgc gaaccccccagg tgtacacact gcccccaagc   1080
agggacgagc tgaccaagaa ccagggtgtcc ctgacacctgtc tcgtgaaagg cttctacccc   1140
tccgatatcg ccgtgaaatg ggagagcaac ggccagcccc agaacaacta caagaccacc   1200
ccccctgtgc tggacagcga cggctcatc ttccctgtaca gcaagctgac cgtggacaag   1260
tcccgggtggc agcagggcaa cgtgttcago tgcagcgtga tgcacgaggc cctgcacaaac   1320
caactacccc agaagtccct gagcctgago cctggcaag                                1359
  
```

<210> SEQ ID NO 480
 <211> LENGTH: 651
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 480

```

cagtctgttc tgacacagcc tccatctgtc tctggcgccc ctggacagag agtgaccatc      60
agctgtacag gcagcagctc caatatcgga gcccgtatc acgtgcactg gtatcagcag     120
ctgcctggca cagccccata actgtgtatc tacggcaaca gcaacagacc cagccggctg     180
cccgatagat ttccggctc taagagcggc acaagcgcca gcctggctat tactggactg     240
caggccgagg acgaggccga ctactactgt cagtcttacg ctggccccaa tccttacgt      300
gtgtttggcg cggcaacaaa gctgaccgtt ctaggccagc ctaaagcgcg ccctagcgt      360
accctgttcc ctccaaagcag cgaggaactg caggccaaaca aggccaccct cgtgtgcctg     420
atcagcgtact tctatcctgg cgccgtgacc gtggccctggg aggccgatag ctctccctgt     480
  
```

-continued

```
aaggccggcg tggaaaccac cacccttagc aagcagagca acaacaata cgccgccagc      540
agctacactga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg      600
acccacgagg gcagcacccgt ggaaaagaca gtggccctca ccgagtgcag c               651
```

```
<210> SEQ ID NO 481
<211> LENGTH: 123
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

```
<400> SEQUENCE: 481
```

```
Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1           5           10          15
```

```
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Asp Ser Tyr
20          25          30
```

```
Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35          40          45
```

```
Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val
50          55          60
```

```
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65          70          75          80
```

```
Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85          90          95
```

```
Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100         105         110
```

```
Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115         120
```

```
<210> SEQ ID NO 482
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

```
<400> SEQUENCE: 482
```

```
Ser Tyr Glu Met Asn
1           5
```

```
<210> SEQ ID NO 483
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

```
<400> SEQUENCE: 483
```

```
Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val Lys
1           5           10          15
```

Gly

```
<210> SEQ ID NO 484
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

```
<400> SEQUENCE: 484
```

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Ser	Gly	Tyr	Ser	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
1						5						10	

<210> SEQ ID NO 485
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 485

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1					5				10			15			

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly
	20					25					30				

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
	35					40					45				

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
	50					55				60					

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Thr	Gly	Leu
	65					70				75			80		

Gln	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Gln	Ser	Tyr	Ala	Gly	Pro
	85						90						95		

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu		
	100					105				110					

<210> SEQ ID NO 486
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 486

Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly	Tyr	Asp	Val	His
1					5					10			

<210> SEQ ID NO 487
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 487

Gly	Asn	Ser	Asn	Arg	Pro	Ser
1					5	

<210> SEQ ID NO 488
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 488

Gln	Ser	Tyr	Ala	Gly	Pro	Asn	Pro	Tyr	Val	Val
1					5				10	

<210> SEQ ID NO 489
<211> LENGTH: 369
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:

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<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 489

gaagttcagc tgcttgaatc tggggcgga ctgggtcaac ctggcggtc tctgagactg	60
agctgtgccg ccaggcgctt cgacttcgtat agctacgaga tgaactgggt ccgacaggcc	120
cctggcaag gccttgaatg ggtgtccggc atcagcttga atagcggtcg gatcgactac	180
ggcgacacgc tgaaggcgcg attcaccatc agecgggaca acagcaagaa caccctgtac	240
ctgcagatga acagccttag agccgaggac accggcggtg actactgtgc cagaaggccc	300
tacagcagcttga ccccgacttc gactattggg gccaggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 490

<211> LENGTH: 15

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 490

agctacgaga tgaac	15
------------------	----

<210> SEQ ID NO 491

<211> LENGTH: 51

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 491

ggcatcagct ggaatagcggt ctggatcgac tacgcccaca gcgtgaaggc c	51
---	----

<210> SEQ ID NO 492

<211> LENGTH: 42

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 492

agcggctaca gcagcttttg gtttgacccc gacttcgact at	42
--	----

<210> SEQ ID NO 493

<211> LENGTH: 333

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 493

cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc caatatcgga gcccgtatg acgtgcactg gtatcagcag	120
ctgcctggca cagccccata actgtgtatc tacggcaaca gcaacagacc cagcggcggt	180
cccgatagat ttccggctc taagagcggt acaaggcaca gcctggctat tactggactg	240
caggccgagg acgaggccga ctactactgt cagtcttacg ctggcccaa tccttacgt	300
gtgtttggcg cgccaacaaa gctgaccgtt cta	333

<210> SEQ ID NO 494

<211> LENGTH: 42

-continued

<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 494

acaggcagca gctccatatat cggagccggc tatgacgtgc ac

42

<210> SEQ ID NO 495
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 495

ggcaaacagca acagaccagg c

21

<210> SEQ ID NO 496
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 496

cagtcttacg ctggcccaa tccttacgtg gtg

33

<210> SEQ ID NO 497
<211> LENGTH: 453
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 497

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1							5	10	15						

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Asp	Phe	Asp	Ser	Tyr
20								25	30						

Glu	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
35								40	45						

Ser	Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val
50								55	60						

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

Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
85								90	95						

Ala	Arg	Ser	Gly	Tyr	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
100								105	110					

Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser	Ala	Ser	Thr	Lys	Gly
115								120	125						

Pro	Ser	Val	Phe	Pro	Leu	Ala	Pro	Ser	Ser	Lys	Ser	Thr	Ser	Gly	Gly
130								135	140						

Thr	Ala	Ala	Leu	Gly	Cys	Leu	Val	Lys	Asp	Tyr	Phe	Pro	Glu	Pro	Val
145								150	155	160					

Thr	Val	Ser	Trp	Asn	Ser	Gly	Ala	Leu	Thr	Ser	Gly	Val	His	Thr	Phe
165								170	175						

Pro	Ala	Val	Leu	Gln	Ser	Ser	Gly	Leu	Tyr	Ser	Leu	Ser	Ser	Val	Val
180								185	190						

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Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
 195 200 205
 Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
 210 215 220
 Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 225 230 235 240
 Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 245 250 255
 Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 260 265 270
 Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 275 280 285
 Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 290 295 300
 Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 305 310 315 320
 Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 325 330 335
 Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 340 345 350
 Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
 355 360 365
 Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
 370 375 380
 Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
 385 390 395 400
 Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 405 410 415
 Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 420 425 430
 Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 435 440 445
 Leu Ser Pro Gly Lys
 450

<210> SEQ ID NO 498
 <211> LENGTH: 217
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 498

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
 1 5 10 15
 Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly
 20 25 30
 Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
 35 40 45
 Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
 50 55 60
 Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
 65 70 75 80
 Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Ala Gly Pro
 85 90 95

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Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu	Gly
100					105					110					
Gln	Pro	Lys	Ala	Ala	Pro	Ser	Val	Thr	Leu	Phe	Pro	Pro	Ser	Ser	Glu
115					120					125					
Glu	Leu	Gln	Ala	Asn	Lys	Ala	Thr	Leu	Val	Cys	Leu	Ile	Ser	Asp	Phe
130					135					140					
Tyr	Pro	Gly	Ala	Val	Thr	Val	Ala	Trp	Lys	Ala	Asp	Ser	Ser	Pro	Val
145					150					155				160	
Lys	Ala	Gly	Val	Glu	Thr	Thr	Thr	Pro	Ser	Gln	Ser	Asn	Asn	Lys	
165					170					175					
Tyr	Ala	Ala	Ser	Ser	Tyr	Leu	Ser	Leu	Thr	Pro	Glu	Gln	Trp	Lys	Ser
180					185					190					
His	Arg	Ser	Tyr	Ser	Cys	Gln	Val	Thr	His	Glu	Gly	Ser	Thr	Val	Glu
195					200					205					
Lys	Thr	Val	Ala	Pro	Thr	Glu	Cys	Ser							
210					215										

<210> SEQ ID NO 499

<211> LENGTH: 1359

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 499

gaagttcagc	tgctgaaatc	tggcgccgga	ctgggttcaac	ctggcggtatc	tctgagactg	60
agctgtgccg	ccagcggctt	cgacttcgat	agctacgaga	tgaactgggt	ccgacaggcc	120
cctggcaaag	gccttgaatg	ggtgtccggc	atcagctggaa	atacgccgtg	gatcgactac	180
gcccacacgc	tgaaggcgcag	attcaccatc	agccgggaca	acagcaagaa	caccctgtac	240
ctgcagatga	acagcctgag	agccgaggac	accgcgcgtg	actactgtgc	cagaaggcgc	300
tacagcagct	cttgggttga	ccccgacttc	gactattggg	gccaggcac	actggtcaca	360
gtctttag	ccagcaccaa	ggggccca	gtgttccctc	tggcccttag	cagcaagagc	420
acatctggcg	gaacagccgc	cctgggctgc	ctcgtgaagg	actacttcc	cgagcccg	480
accgtgtct	ggaactctgg	cgctctgaca	agccgcgtgc	acacctttcc	agccgtgctg	540
cagagcgcg	ccctgtactc	tctgagcago	gtcgtgacag	tgcgcagcag	ctctctggc	600
acccagacct	acatctgcaa	cgtgaaccac	aagcccagca	acaccaaggt	ggacaagaag	660
gtggaaacca	agagctgcga	caagacccac	acctgtcccc	cttgcctgc	ccccgaaactg	720
ctggggaggcc	cttccgtgtt	cctgttcccc	ccaaagccca	aggacaccct	gatgatcagc	780
cggacccccc	aaagtgcactg	cgtgggtgg	gatgtgtccc	acgaggaccc	tgaagtgaag	840
ttcaatttgt	acgtggacgg	cgtgaaagt	cacaacgcca	agaccaagcc	tagagaggaa	900
cagtacaaca	gcacacctcg	ggtgggtgtcc	gtgctgacag	tgctgcacca	ggactggctg	960
aacggcaaag	agtacaagt	caagggtgtcc	aacaaggccc	tgcctgcccc	catcgagaaa	1020
acatcagca	aggccaaggg	ccagccccgc	gaacccccc	cgtacacact	gcccccaagc	1080
agggacgagc	tgaccaagaa	ccaggtgtcc	ctgacacctgc	tcgtgaaagg	cttctacccc	1140
tccgatatcg	ccgtgaaatg	ggagagcaac	ggccagcccc	agaacaacta	caagaccacc	1200
ccccctgtgc	tggaacagcga	cggctcatc	ttctctgtaca	gcaagctgac	cgtggacaag	1260
tcccggtggc	agcagggcaa	cgtgttcago	tgcagcgtga	tgcacgaggc	cctgcacaac	1320
cactacaccc	agaagtccct	gagcctgago	cctggcaag			1359

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<210> SEQ ID NO 500

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 500

cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc caatatcgga gcccggctatg acgtgcactg gtatcagcag	120
ctgcctggca cagccccctaa actgtgtatc tacggcaaca gcaacagacc cagcggcgtg	180
cccgatagat ttccggctc taagagcgcc acaagcgcca gcctggctat tactggactg	240
caggccgagg acgaggccga ctactactgt cagtcttacg ctggcccaa tccttacgtg	300
gtgtttggcg gcggaacaaa gctgaccgtt cttaggccgc ctaaagccgc ccctagcgtg	360
accctgttcc ctccaaagcag cgaggaactg caggccaaaca aggccacccct cgtgtgcctg	420
atcagcgaact tctatctgg cgccgtgacc gtggcctgga aggccgatag ctcttctgtg	480
aaggccggcg tggaaaccac cacccctago aagcagagca acaacaata cgccgcccgc	540
agctacctga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 501

<211> LENGTH: 123

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 501

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Asp Ser Tyr	
20 25 30	
Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	
Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val	
50 55 60	
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr	
65 70 75 80	
Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys	
85 90 95	
Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr	
100 105 110	
Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser	
115 120	

<210> SEQ ID NO 502

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 502

Ser Tyr Glu Met Asn	
1 5	

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<210> SEQ ID NO 503
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 503

Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val	Lys
	5					10								15	

Gly

<210> SEQ ID NO 504
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 504

Ser	Gly	Tyr	Ser	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
1						5						10	

<210> SEQ ID NO 505
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 505

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1					5				10				15		

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asp	Ile	Gly	Ala	Gly
			20			25						30			

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
			35			40					45				

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
	50				55		60								

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Thr	Gly	Leu
65				70			75					80			

Gln	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Gln	Ser	Tyr	Ala	Gly	Ile
	85				90				95						

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu		
			100			105				110					

<210> SEQ ID NO 506
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 506

Thr	Gly	Ser	Ser	Asp	Ile	Gly	Ala	Gly	Tyr	Asp	Val	His
1					5						10	

<210> SEQ ID NO 507
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:

-continued

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 507

Gly	Asn	Ser	Asn	Arg	Pro	Ser
1				5		

<210> SEQ ID NO 508

<211> LENGTH: 11

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 508

Gln	Ser	Tyr	Ala	Gly	Ile	Asn	Pro	Tyr	Val	Val
1				5				10		

<210> SEQ ID NO 509

<211> LENGTH: 369

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 509

gaagttcagc	tgctggaatc	tggcgccgga	ctgggtcaac	ctggcggtac	tctgagactg	60
agctgtgccg	ccagcggctt	cacccatcgat	agctacgaga	tgaactgggt	ccgacaggcc	120
cctggcaaa	gccttgaatg	ggtgtccggc	atcagctgga	atagcggctg	gatcgactac	180
ggcgacagcg	tgaagggcag	attcaccatc	agccgggaca	acagcaagaa	caccctgtac	240
ctgcagatga	acagcctgag	agccgaggac	accgcgtgt	actactgtgc	cagaaggccc	300
tacagcagct	cttgggttga	ccccgacttc	gactattggg	gccagggcac	actggtcaca	360
gtctcttca						369

<210> SEQ ID NO 510

<211> LENGTH: 15

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 510

agctacgaga	tgaac	15
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<210> SEQ ID NO 511

<211> LENGTH: 51

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 511

ggcatcagct	ggaatagccg	ctggatcgac	tacgcccaca	gcgtgaaggc	c	51
------------	------------	------------	------------	------------	---	----

<210> SEQ ID NO 512

<211> LENGTH: 42

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 512

gcggctaca	gcagctttg	gtttgacccc	gacttcgact	at	42
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<210> SEQ ID NO 513
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 513

```
cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc      60
agctgtacag gcagcagctc cgatattggc gcccggatacg acgtgcactg gtatcagcaa     120
ctgcctggca cagccccctaa gctgtgtac tacggcaaca gcaacagacc tagcggcgtg     180
ccccgatagat tcagcggctc taagtctggc acaaggcgcctt tactggactg             240
caggcccgaag atgaggccga ctactactgt cagagctacg ccggcatcaa cccctacgtg     300
gtgtttggcg gaggcaccaa gctgacagtt cta                                         333
```

<210> SEQ ID NO 514
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 514

```
acaggcagca gctccgatat tggcgccgga tacgacgtgc ac                                         42
```

<210> SEQ ID NO 515
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 515

```
ggcaacagca acagacctag c                                         21
```

<210> SEQ ID NO 516
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 516

```
cagagctacg ccggcatcaa cccctacgtg gtg                                         33
```

<210> SEQ ID NO 517
<211> LENGTH: 453
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 517

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Ley	Val	Gln	Pro	Gly	Gly
1					5			10				15			

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Asp	Ser	Tyr
					20			25				30			

Glu	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Ley	Glu	Trp	Val
					35			40				45			

Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val

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50	55	60
Lys	Gly	Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65	70	75
80		
Leu	Gln	Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85	90	95
Ala	Arg	Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100	105	110
Trp	Gly	Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115	120	125
Pro	Ser	Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130	135	140
Thr	Ala	Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145	150	155
160		
Thr	Val	Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165	170	175
Pro	Ala	Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180	185	190
Thr	Val	Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195	200	205
Asn	His	Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210	215	220
Ser	Cys	Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225	230	235
240		
Leu	Gly	Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245	250	255
Leu	Met	Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260	265	270
Ser	His	Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275	280	285
Glu	Val	His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290	295	300
Thr	Tyr	Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305	310	315
320		
Asn	Gly	Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325	330	335
Pro	Ile	Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340	345	350
Gln	Val	Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
355	360	365
Val	Ser	Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370	375	380
Val	Glu	Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385	390	395
400		
Pro	Pro	Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405	410	415
Thr	Val	Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420	425	430
Val	Met	His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
435	440	445
Leu	Ser	Pro Gly Lys
450		

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<211> LENGTH: 217
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 518

 Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
 1 5 10 15

 Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asp Ile Gly Ala Gly
 20 25 30

 Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
 35 40 45

 Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
 50 55 60

 Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
 65 70 75 80

 Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Gln Ser Tyr Ala Gly Ile
 85 90 95

 Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
 100 105 110

 Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
 115 120 125

 Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
 130 135 140

 Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
 145 150 155 160

 Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
 165 170 175

 Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
 180 185 190

 His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
 195 200 205

 Lys Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> SEQ ID NO 519
 <211> LENGTH: 1359
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 519

 gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcggtc tctgagactg 60
 agctgtgcgg ccagcggtt caccttcgtt agctacgaga tgaactgggt ccgacaggcc 120
 cctggcaaaag gccttgaatg ggtgtccggc atcagctggaa atagcggtcg gatcgactac 180
 gcccacacgc tgaaggccag attcaccatc agccgggaca acagcaagaa caccctgtac 240
 ctgcagatga acagcctgag agccgaggac accgcccgtt actactgtgc cagaaggccc 300
 tacagcagct cttggtttga cccccacttc gactattggg gccaggccac actggtcaca 360
 gtctcttcag ccagcaccaa gggccccagc gtgttccctc tggcccttag cagcaagagc 420
 acatctggcg gaacagccgc cctgggtctgc ctctgttggg actactttcc cgagccgttg 480
 accgtgttcc ggaactctgg cgctctgaca agccggcgtgc acacctttcc agccgtgtc 540
 cagagcagcg gcctgtactc tctgagcago gtcgtgacag tgcccaagcag ctctctggc 600

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accaggacccat acatctgcaa cgtgaaccac aagcccagca acaccaaggt ggacaagaag	660
gtggaaaccca agagctgcga caagacccac acctgtcccc ctgttctgc ccccgaaactg	720
ctggggaggcc cttccgtgtt cctgttcccc ccaaagccca aggacaccct gatgtcagc	780
cggacccccc aagtgacctg cgtgggtgtg gatgtgtccc acgaggaccc tgaagtgaag	840
ttcaatttgtt acgtggacgg cgtgaaagtgc cacaacgcca agaccaagcc tagagaggaa	900
cagtacaaca gcacctaccg ggtgggtgtcc gtgctgacag tgctgaccca ggactggctg	960
aacggcaaaag agtacaagtgc caagggtgtcc aacaaggccc tgctgcccc catcgagaaa	1020
accatcagca aggccaagggg ccagccccgc gaaccccccagg tgtacacact gcccccaagc	1080
agggacgagc tgaccaagaa ccaggtgtcc ctgacctgtc tctgtaaagg ctttacccc	1140
tccgatatacg ccgtggaaatg ggagagcaac ggccagcccc agaacaacta caagaccacc	1200
ccccctgtgc tggacagcga cggctcatc ttctgtaca gcaagctgac cgtggacaag	1260
tcccggtggc agcaggccaa cgtgttcago tgcagcgtga tgcacgaggc cctgcacaac	1320
cactacaccc agaagtccct gagcctgago cctggcaag	1359

<210> SEQ ID NO 520

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 520

cagtctgttc tgacacagcc tccatctgtg tctggcgeccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc cgatattggc gccggatacg acgtgcactg gtatcagcaa	120
ctgcctggca cagccctaa gctgtgatc tacggcaaca gcaacagacc tagcggcgtg	180
cccgatagat tcagcggctc taagtctggc acaagcgcaca gcctggccat tactggactg	240
caggccgaag atgaggccga ctactactgt cagagctacg ccggcatcaa cccctacgt	300
gtgtttggcg gaggcaccaa gctgacagtt ctaggccagc ctaaagccgc ccctagcgtg	360
accctgttcc ctccaagcag cgaggaactg caggccaaaca aggccaccct cgtgtgcctg	420
atcagcgtact tctatctgg cgcegtgacc gtggcctggg aggccatag ctctctgt	480
aaggccggcg tggaaaccac cacccttagc aagcagagca acaacaata cgccgccagc	540
agctacactga gcctgacccc cgagcgtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt gaaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 521

<211> LENGTH: 123

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 521

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Asp Ser Tyr	
20 25 30	

Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	

Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val	
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50 55 60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
 115 120

<210> SEQ ID NO 522
 <211> LENGTH: 5
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 522

Ser Tyr Glu Met Asn
 1 5

<210> SEQ ID NO 523
 <211> LENGTH: 17
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 523

Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val Lys
 1 5 10 15

Gly

<210> SEQ ID NO 524
 <211> LENGTH: 14
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 524

Ser Gly Tyr Ser Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
 1 5 10

<210> SEQ ID NO 525
 <211> LENGTH: 111
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 525

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asp Ile Gly Ala Gly
 20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
 35 40 45

Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
 50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
 65 70 75 80

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Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr Glu Gly Ile
 85 90 95

Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
 100 105 110

<210> SEQ ID NO 526
 <211> LENGTH: 14
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 526

Thr Gly Ser Ser Ser Asp Ile Gly Ala Gly Tyr Asp Val His
 1 5 10

<210> SEQ ID NO 527
 <211> LENGTH: 7
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 527

Gly Asn Ser Asn Arg Pro Ser
 1 5

<210> SEQ ID NO 528
 <211> LENGTH: 11
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 528

Ser Ser Tyr Glu Gly Ile Asn Pro Tyr Val Val
 1 5 10

<210> SEQ ID NO 529
 <211> LENGTH: 369
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 529

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt cgacttcgat agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccggc atcagctggaa atagcggtcg gatcgactac	180
gccgacagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accgcgtgt actactgtgc cagaagcgcc	300
tacagcagct cttgggttga cccccacttc gactattggg gccagggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 530
 <211> LENGTH: 15
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 530

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agctacgaga tgaac	15
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<210> SEQ ID NO 531
<211> LENGTH: 51
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 531

ggcatcagt ggaatagcggttggatcgacttgcgaca gctgtaaaggcc	51
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<210> SEQ ID NO 532
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 532

agcggctaca gcagcttttgcgttgcaccgcgttgcactat	42
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<210> SEQ ID NO 533
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 533

cagtctgttc tgacacagcc tccatctgtgttggcgcccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc cgatattggc gcccggatacg acgtgcactg gtatcagcaa	120
ctgcctggca cagccctaa gctgtgtatc tacggcaaca gcaacagacc tagcggcgttgc	180
cccgatagat tcagcggctc taagtctggc acaagcgcaca gcctggccat tactggactg	240
caggccgaag atgaggccga ctactactgc agcagctacg agggcatcaa cccctacgttgc	300
gtgtttggcg cgccaaacaaa gctgaccgtt cta	333

<210> SEQ ID NO 534
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 534

acaggcagca gctccgatat tggcgccgga tacgacgtgc ac	42
--	----

<210> SEQ ID NO 535
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 535

ggcaacagca acagaccttag c	21
--------------------------	----

<210> SEQ ID NO 536
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:

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<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 536

agcagctacg agggcatcaa cccctacgtg gtg

33

<210> SEQ ID NO 537

<211> LENGTH: 453

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 537

Glu Val Gln Leu Leu Glu Ser Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Asp Ser Tyr
20 25 30Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val
50 55 60Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65 70 75 80Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100 105 110Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

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Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

<210> SEQ ID NO 538

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 538

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asp Ile Gly Ala Gly
20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
35 40 45

Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr Glu Gly Ile
85 90 95

Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly
100 105 110

Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
115 120 125

Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
130 135 140

Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
145 150 155 160

Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
165 170 175

Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
180 185 190

His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
195 200 205

Lys Thr Val Ala Pro Thr Glu Cys Ser
210 215

<210> SEQ ID NO 539

<211> LENGTH: 1359

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<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 539

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gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg      60
agctgtgcgg ccagcggctt cgacttcgtat agctacgaga tgaactgggt ccgacaggcc    120
cctggcaaag gccttgaatg ggtgtccggc atcagctggaa atagcggctg gatcgactac    180
ccccacacgc tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac    240
ctgcagatga acagcctgag agccgaggac accggcgatc actactgtgc cagaagcgcc    300
tacagcagct cttggtttga ccccgacttc gactattggg gccagggcac actggtcaca    360
gtctcttcag ccagcaccaa gggccccccago gtgttccctc tggcccttag cagcaagagc    420
acatctggcg gaacagccgc cctgggctgc ctctgtaaagg actactttcc cgagccccgtg    480
accgtgtctt ggaactctgg cgctctgaca agcggcgatc acacccccc agccgtgtcg    540
cagagcagcg gcctgtactc tctgagcago gtctgtacag tgcccgccag ctctctggc    600
acccagaccc acatctgaa cgtgaaccac aagcccgacca acaccaaggt ggacaagaag    660
gtggaaaccca agagctgcga caagacccac acctgtcccc cttgtctgc ccccgaaactg    720
ctggggggcc cttccgtgtt cctgtcccc ccaaagccca aggacacccct gatgtcagc    780
cgggacccccc aagtgacctg cgtgggtgtg gatgtgtccc acgaggaccc tgaagtgaag    840
ttcaatttgtt acgtggacgg cgtggaaatg cacaacgcac agaccaagcc tagagaggaa    900
cagttacaaca gcacccatccg ggtgggtgtcc gtctgtacag tgctgtccca ggactggctg    960
aacggccaaag agtacaatgtt caagggtgtcc aacaaggcccc tcgtgtcccc catcgagaaa 1020
accatcagca aggccaaggcc ccagccccccgc gaaccccgagg tgtacacact gcccccaagc 1080
agggacgagc tgaccaagaa ccagggtgtcc ctgacccgtc tcgtgtccca aggacccccc 1140
tccgatcatcg ccgtggaaatg ggagagcaac ggcagcccccc agaacaacta caagaccacc 1200
ccccctgtgc tggacacgcga cggctcatc ttctgtaca gcaagctgac cgtggacaag 1260
tcccggtggc agcagggcaa cgtgttcago tgcacgtgtc tgcacggggc cctgcacaaac 1320
cactacaccc agaaggccct gagectgago cctggcaag                                1359

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<210> SEQ ID NO 540
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 540

```

cagtctgttc tgacacagcc tccatctgtc tctggcgccc ctggacagag agtgaccatc      60
agctgtacag gcagcagctc cgatattggc gccggatacg acgtgcactg gtatcagcaa    120
ctgcctggca cagccctaa gctgtgtatc tacggcaaca gcaacagacc tagcggcgatg    180
cccgatagat tcagcggctc taagtctggc acaagcgcac gctggccat tactggactg    240
caggccgaag atgaggccga ctactactgc agcagctacg agggcatcaa cccctacgtg    300
gtgtttggcg gccaacaaa gctgaccgtt cttagccagc ctaaagccgc ccctagcgtg    360
accctgttcc ctccaaacgcag cgaggaaactg caggccaaaca aggccaccct cgtgtgcctg    420
atcagcgtact tctatctgg cgccgtgacc gtggcctggc aggccgatag ctctctgtg    480

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553**554**

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aaggccggcg tggaaaccac caccctago aagcagagca acaacaata cgccgccagc	540
agctacatga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcacccgt ggaaaagaca gtggccctta ccgagtgcaag c	651

<210> SEQ ID NO 541
<211> LENGTH: 123
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 541

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Ser Tyr	
20 25 30	
Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	
Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val	
50 55 60	
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr	
65 70 75 80	
Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys	
85 90 95	
Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr	
100 105 110	
Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser	
115 120	

<210> SEQ ID NO 542
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 542

Ser Tyr Glu Met Asn	
1 5	
Gly	

<210> SEQ ID NO 543
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 543

Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val Lys	
1 5 10 15	
Gly	

<210> SEQ ID NO 544
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 544

Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr	
---	--

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1 5 10

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<210> SEQ ID NO 545
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 545

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly
20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
35 40 45

Leu Ile Tyr Gly Ala Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr Glu Gly Pro
85 90 95

Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu
100 105 110

```

```

<210> SEQ ID NO 546
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 546

```

```

Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly Tyr Asp Val His
1 5 10

```

```

<210> SEQ ID NO 547
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

```

```
<400> SEQUENCE: 547
```

```

Gly Ala Ser Asn Arg Pro Ser
1 5

```

```

<210> SEQ ID NO 548
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

```

```
<400> SEQUENCE: 548
```

```

Ser Ser Tyr Glu Gly Pro Asn Pro Tyr Val Val
1 5 10

```

```

<210> SEQ ID NO 549
<211> LENGTH: 369
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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-continued

<400> SEQUENCE: 549

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgcgg ccagcggtt cgatttcagc agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaaag gccttgaatg ggtgtccggc atcagctggaa atagcggctg gatcgactac	180
gccgacagcg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accgcccgtt actactgtgc cagaagcgcc	300
tacagcagct cttggtttga cccccacttc gactattggg gccagggcac actggtcaca	360
gtctcttca	369

<210> SEQ ID NO 550

<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 550

agctacgaga tgaac	15
------------------	----

<210> SEQ ID NO 551

<211> LENGTH: 51
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 551

ggcatcagct ggaatagcggtt ctggatcgac tacgcccaca gcgtgaaggg c	51
--	----

<210> SEQ ID NO 552

<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 552

agcggctaca gcagcttgcgtt gtttgacccca gacttcgact at	42
---	----

<210> SEQ ID NO 553

<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 553

cagtctgttc tgacacagcc tccatctgtc tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc caatatcgga gccggctatg acgtgcactg gtatcagcag	120
ctgcctggca cagccctaa actgtgtatc tacggcgcca gcaatagacc tagcggctg	180
cccgatagat tcagcggctc taagtctggc acaagcgcaca gctggccat tactggactg	240
caggccgaag atgaggccga ctactactgc agcagctacg agggccccaa tccttacgtg	300
gtgtttggcg gcggAACAAA gctgaccgtt cta	333

<210> SEQ ID NO 554

<211> LENGTH: 42
<212> TYPE: DNA

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<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 554

acaggcagca gctccaatat cggagccggc tatgacgtgc ac

42

<210> SEQ ID NO 555
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 555

ggcgccagca atagacctag c

21

<210> SEQ ID NO 556
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 556

agcagctacg agggccccaa tccttacgtg gtg

33

<210> SEQ ID NO 557
<211> LENGTH: 453
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 557

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Asp Phe Ser Ser Tyr
20 25 30

Glu Met Asn Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Gly Ile Ser Trp Asn Ser Gly Trp Ile Asp Tyr Ala Asp Ser Val
50 55 60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

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

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195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
 210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
 225 230 235 240

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
 245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
 260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
 275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
 290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
 305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
 325 330 335

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
 340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
 355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
 370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
 385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
 405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
 420 425 430

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
 435 440 445

Leu Ser Pro Gly Lys
 450

<210> SEQ ID NO 558

<211> LENGTH: 217

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 558

Gln Ser Val Leu Thr Gln Pro Pro Ser Val Ser Gly Ala Pro Gly Gln
 1 5 10 15

Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly
 20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu
 35 40 45

Leu Ile Tyr Gly Ala Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe
 50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu
 65 70 75 80

Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr Glu Gly Pro
 85 90 95

Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly

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100	105	110
Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu		
115	120	125
Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe		
130	135	140
Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val		
145	150	155
Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys		
165	170	175
Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser		
180	185	190
His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu		
195	200	205
Lys Thr Val Ala Pro Thr Glu Cys Ser		
210	215	

<210> SEQ ID NO 559

<211> LENGTH: 1359

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 559

gaagttcagc tgctggaatc tggcgccgga ctgggtcaac ctggcggtc tctgagactg	60
agctgtgcgc ccagcggctt cgatttcagc agctacgaga tgaactgggt ccgacaggcc	120
cctggcaaag gccttgaatg ggtgtccggc atcagctgga atagcggctg gatcgactac	180
ggccgacagcg tgaaggcagc attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accgcgtgt actactgtgc cagaagccgc	300
tacagcagct cttggttga ccccgacttc gactattggg gccagggcac actggtcaca	360
gtctcttcag ccagcaccaa gggccccago gtgttccctc tggcccttag cagcaagagc	420
acatctggcg gaacagccgc cctgggctgc ctctgtcagg actactttcc cgagccctgt	480
accgtgtctt ggaactctgg cgctctgaca aegggcgtgc acacctttcc agccgtgtc	540
cagagcagcg gcctgtactc tctgagcago gtcgtgacag tgcccagcag ctctctggc	600
acccagacct acatctgcaa cgtgaaccac aagcccagca acaccaaggt ggacaagaag	660
gtggaaaccca agagctgcga caagacccac acctgtcccc cttgtctgc ccccgaaactg	720
ctgggaggcc cttccgtgtt cctgttcccc ccaaagccca aggacaccct gatgtcagc	780
cggacccccc aagtgacctg cgtgggtggtg gatgtgtccc acgaggaccc tgaagtgaag	840
ttcaatttgt acgtggacgg cgtggaaatg cacaacgcca agaccaagcc tagagagaa	900
cagtacaaca gcaccttaccg ggtgggtgtcc gtgtgacag tgctgcacca ggactggctg	960
aacggcaaag agtacaagtg caagggtgtcc aacaaggccc tgcctgcccc catcgagaaa	1020
accatcagca aggccaaggg ccagccccgc gaaccccagg tgtacacact gcccccaagc	1080
agggacgacgc tgaccaagaa ccagggtgtcc ctgacctgtc tcgtgaaagg cttctacccc	1140
tccgatatacg ccgtggaaatg ggagagcaac ggccagcccc agaacaacta caagaccacc	1200
ccccctgtgc tggacagcga cggctcatc ttccctgtaca gcaagctgac cgtggacaag	1260
tcccgggtggc agcaggggcaa cgtgttcago tgcagcgtga tgcacgaggc cctgcacaac	1320
cactacaccc agaagtccct gagcctgago cctggcaag	1359

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<210> SEQ ID NO 560
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 560

cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc 60
agctgtacag gcagcagctc caatatcgga gccggctatg acgtgcactg gtatcagcag 120
ctgcctggca cagccccctaa actgtgtatc tacggcgcca gcaatagacc tagccggctg 180
cccgatagat tcagcggctc taagtctggc acaaggcaca gcctggccat tactggactg 240
caggccgaag atgaggccga ctactactgc agcagctacg agggccccaa tccttacgtg 300
gtgtttggcg gcgaaacaaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgtg 360
acctgttcc ctccaaagcag cgaggaaactg caggccaaaca aggccaccct cgtgtgcctg 420
atcagcgtact tctatcctgg cgccgtgacc gtggcctgga agggcgatag ctctcctgtg 480
aaggccggcg tggaaaccac cacccttagc aagcagagac acaacaaaata cgccggccagc 540
agctaacctga gctgaccccc cgagcagtgg aagtcccacacat gatcctacag ctgccaagtg 600
acccacqaaqq qcaqacccqt qqaaaaqaca qtqgccccata ccqaqtqcaq c 651

<210> SEQ ID NO 561
 <211> LENGTH: 123
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 561

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1					5					10					15
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Asp	Ser	Tyr
					20			25					30		
Glu	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
					35			40				45			
Ser	Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val
					50			55			60				
Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr
					65			70			75				80
Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
					85			90					95		
Ala	Arg	Ser	Gly	Tyr	Ser	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr
					100			105					110		
Trp	Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser					
					115			120							

```
<210> SEQ ID NO 562
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 562
Ser Tyr Glu Met Asn
1 5

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<210> SEQ ID NO 563
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 563

Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val	Lys
1	5			10				15							

Gly

<210> SEQ ID NO 564
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 564

Ser	Gly	Tyr	Ser	Ser	Trp	Phe	Asp	Pro	Asp	Phe	Asp	Tyr			
1	5			10											

<210> SEQ ID NO 565
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 565

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1	5			10				15							

Arg	Val	Thr	Ile	Ser	Cys	Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly
20				25				30							

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Thr	Ala	Pro	Lys	Leu
35				40				45							

Leu	Ile	Tyr	Gly	Asn	Ser	Asn	Arg	Pro	Ser	Gly	Val	Pro	Asp	Arg	Phe
50				55			60								

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Thr	Gly	Leu
65				70			75			80					

Gln	Ala	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ser	Ser	Tyr	Ala	Gly	Pro
85				90				95							

Asn	Pro	Tyr	Val	Val	Phe	Gly	Gly	Thr	Lys	Leu	Thr	Val	Leu		
100				105			110								

<210> SEQ ID NO 566
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 566

Thr	Gly	Ser	Ser	Ser	Asn	Ile	Gly	Ala	Gly	Tyr	Asp	Val	His		
1	5			10											

<210> SEQ ID NO 567
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 567

```
Gly Asn Ser Asn Arg Pro Ser
1           5
```

```
<210> SEQ ID NO 568
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 568

```
Ser Ser Tyr Ala Gly Pro Asn Pro Tyr Val Val
1           5           10
```

```
<210> SEQ ID NO 569
<211> LENGTH: 369
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 569

```
gaagttcagc tgctgaaatc tggcgccgga ctggttcaac ctggcgatc tctgagactg      60
agctgtgccg ccagcggctt cacttcgat agctacgaga tgaactgggt ccgacaggcc      120
cctggcaaag gccttgaatg ggtgtccggc atcagctgga atagcggctg gatcgactac      180
ggccacacgc tgaaggcag attcaccatc agccgggaca acagcaagaa caccctgtac      240
ctgcagatga acagcctgag agccgaggac accgcccgtgt actactgtgc cagaagccgc      300
tacagcagct cttggtttga ccccgacttc gactattggg gccagggcac actggtcaca      360
gtctcttca                                         369
```

```
<210> SEQ ID NO 570
<211> LENGTH: 15
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 570

```
agctacgaga tgaac                                         15
```

```
<210> SEQ ID NO 571
<211> LENGTH: 51
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 571

```
ggcatcagct ggaatagcgg ctggatcgac tacgcccaca gcgtgaaggg c
```

51

```
<210> SEQ ID NO 572
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 572

```
gcggctaca gcagctttg gtttgacccc gacttcgact at
```

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-continued

<210> SEQ ID NO 573
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 573

```
cagtctgttc tgacacagcc tccatctgtg tctggcgeccc ctggacagag agtgaccatc      60
agctgtacag gcagcagctc caatatcgga gccggctatg acgtgcactg gtatcagcag      120
ctgcctggca cagccccctaa actgtgtatc tacggcaaca gcaacagacc cagcggcgtg      180
cccgatagat ttccggctc taagagcggc acaaggcaca gcctggctat tactggactg      240
caggcccagg acgaggccga ctactactgt agctttaacg ctggcccaa tccttacgtg      300
gtgtttggcg gcggaacaaa gctgaccgtt cta                                333
```

<210> SEQ ID NO 574
<211> LENGTH: 42
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 574

```
acaggcagca gctccaatat cggagccggc tatgacgtgc ac                                42
```

<210> SEQ ID NO 575
<211> LENGTH: 21
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 575

```
ggcaacagca acagacccag c                                21
```

<210> SEQ ID NO 576
<211> LENGTH: 33
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 576

```
agctttaacg ctggcccaa tccttacgtg gtg                                33
```

<210> SEQ ID NO 577
<211> LENGTH: 453
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 577

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1															
							5			10			15		

Ser

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Asp	Ser	Tyr
										20		25		30	

Glu

Glu	Met	Asn	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
										35		40		45	

Ser

Ser	Gly	Ile	Ser	Trp	Asn	Ser	Gly	Trp	Ile	Asp	Tyr	Ala	Asp	Ser	Val
										50		55		60	

-continued

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Ser Gly Tyr Ser Ser Trp Phe Asp Pro Asp Phe Asp Tyr
100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly
115 120 125

Pro Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly
130 135 140

Thr Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val
145 150 155 160

Thr Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe
165 170 175

Pro Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val
180 185 190

Thr Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val
195 200 205

Asn His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys
210 215 220

Ser Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu
225 230 235 240

Leu Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr
245 250 255

Leu Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val
260 265 270

Ser His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val
275 280 285

Glu Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser
290 295 300

Thr Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu
305 310 315 320

Asn Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala
325 330 335

Pro Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro
340 345 350

Gln Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln
355 360 365

Val Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala
370 375 380

Val Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr
385 390 395 400

Pro Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu
405 410 415

Thr Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser
420 425 430

Val Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser
435 440 445

Leu Ser Pro Gly Lys
450

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<212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 578

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Val	Ser	Gly	Ala	Pro	Gly	Gln
1															15
Arg Val Thr Ile Ser Cys Thr Gly Ser Ser Ser Asn Ile Gly Ala Gly															
															20 25 30
Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Thr Ala Pro Lys Leu															
															35 40 45
Leu Ile Tyr Gly Asn Ser Asn Arg Pro Ser Gly Val Pro Asp Arg Phe															
															50 55 60
Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Thr Gly Leu															
															65 70 75 80
Gln Ala Glu Asp Glu Ala Asp Tyr Tyr Cys Ser Ser Tyr Ala Gly Pro															
															85 90 95
Asn Pro Tyr Val Val Phe Gly Gly Thr Lys Leu Thr Val Leu Gly															
															100 105 110
Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu															
															115 120 125
Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe															
															130 135 140
Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val															
															145 150 155 160
Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys															
															165 170 175
Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser															
															180 185 190
His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu															
															195 200 205
Lys Thr Val Ala Pro Thr Glu Cys Ser															
															210 215

<210> SEQ_ID NO 579
 <211> LENGTH: 1359
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 579

gaagttcagc	tgctggaatc	tggcgccgga	ctgggttcaac	ctggcggttc	tctgagactg	60
agctgtgccg	ccagcgccctt	cacccatcgat	agctacgaga	tgaactgggt	ccgacaggcc	120
cctggcaaag	gccttgaatg	ggtgtccggc	atcagctgg	atagcggtcg	gatecgactac	180
gccgacagcg	tgaagggcag	attcaccatc	agccgggaca	acagcaagaa	caccctgtac	240
ctgcagatga	acagcctgag	agccgaggac	accggcgtgt	actactgtgc	cagaagcgcc	300
taacgcgcgt	cttgggttga	ccccgacttc	gactattggg	gcacaggcac	actggtcaca	360
gtctcttcag	ccagcaccaa	gggccccaga	gtgttccctc	tggcccttag	cagcaagagc	420
acatctggcg	gaacagccgc	cctgggctgc	ctcgtgaagg	actactttcc	cgagcccgtg	480
accgtgtctt	ggaactctgg	cgctctgaca	agcggcgtgc	acaccttcc	agccgtgtcg	540
cagagcagcg	gcctgtactc	tctgagcagc	gtcgtgacag	tgcccagcag	ctctctggc	600

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acccagacct acatctgcaa cgtgaaccac aagcccagca acaccaaggt ggacaagaag	660
gtggaaaccca agagctgcga caagacccac acctgtcccc ctgtcctgc ccccgaaactg	720
ctgggaggcc ctccgtgtt cctgttcccc ccaaagccca aggacaccct gatgatcagc	780
cggacccccc aagtgacctg cgtggtggtg gatgtgtccc acgaggaccc tgaagtgaag	840
ttcaatttgt acgtggacgg cgtggaaagtg cacaacgcca agaccaagcc tagagaggaa	900
cagtacaaca gcacctaccg ggtggtgtcc gtgtgacag tgctgcacca ggactggctg	960
aacggcaaag agtacaagtg caaggtgtcc aacaaggecc tgctgcacca catcgagaaa	1020
acatcagca aggccaaggg ccagccccgc gaacccccagg tgtacacact gcccccaagc	1080
agggacgagc tgaccaagaa ccaggtgtcc ctgacctgtc tcgtgaaagg cttctacccc	1140
tccgatatcg ccgtggatg ggagagcaac ggccagcccc agaacaacta caagaccacc	1200
ccccctgtgc tggacagcga cggctcatc ttccctgtaca gcaagctgac cgtggacaag	1260
tcccggtggc agcagggcaa cgttttcago tgcagcgtga tgcacgaggc cctgcacaac	1320
caactacaccc agaagtccct gagcctgago cctggcaag	1359

<210> SEQ ID NO 580

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 580

cagtctgttc tgacacagcc tccatctgtg tctggcgccc ctggacagag agtgaccatc	60
agctgtacag gcagcagctc caatatcgga gccggctatg acgtgcactg gtatcagcag	120
ctgcctggca cagccccctaa actgtgtat tacggcaaca gcaacagacc cagcggcgtg	180
cccgatagat ttccggctc taagagcggc acaagcgcca gcctggctat tactggactg	240
caggccgagg acgaggccga ctactactgt agctttaacg ctggcccaa tccttacgtg	300
gtgtttggcg gcggaacaaa gctgaccgtt ctaggccagc ctaaagccgc ccctagcgtg	360
acccctgttcc ctccaaagcag cgaggaactg caggccaaca aggccaccct cgtgtgcctg	420
atcagcgact tctatcctgg cgccgtgacc gtggcctggg aggccgatag ctctcctgtg	480
aaggccggcg tggaaaccac caccccttagc aagcagagca acaacaata cgccgcccagc	540
agctacactga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt ggaaaagaca gtggcccta ccgagtgcag c	651

<210> SEQ ID NO 581

<211> LENGTH: 990

<212> TYPE: PRT

<213> ORGANISM: Homo sapiens

<400> SEQUENCE: 581

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

Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe Asn Gly Leu		
20	25	30

Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser		
35	40	45

Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asp Leu Val		
50	55	60

Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg	
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65	70	75	80
Arg Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys Glu Cys Ala			
85	90	95	
Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His Leu Tyr Ala			
100	105	110	
Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Ile Gly			
115	120	125	
His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn Ser His Phe Glu			
130	135	140	
Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser			
145	150	155	160
Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met			
165	170	175	
Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His Pro Ile			
180	185	190	
Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Lys Phe Ile			
195	200	205	
Ser Ala His Leu Ile Ser Glu Ser Asp Asn Pro Glu Asp Asp Lys Val			
210	215	220	
Tyr Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys			
225	230	235	240
Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly			
245	250	255	
His Arg Ser Leu Val Asn Lys Trp Thr Phe Leu Lys Ala Arg Leu			
260	265	270	
Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu			
275	280	285	
Leu Gln Asp Val Phe Leu Met Asn Phe Lys Asp Pro Lys Asn Pro Val			
290	295	300	
Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala			
305	310	315	320
Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro			
325	330	335	
Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly			
340	345	350	
Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly			
355	360	365	
Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala			
370	375	380	
Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Met Asn Asn Arg			
385	390	395	400
Pro Ile Val Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val			
405	410	415	
Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile			
420	425	430	
Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile Pro Lys Glu			
435	440	445	
Thr Trp Tyr Asp Leu Glu Glu Val Leu Leu Glu Glu Met Thr Val Phe			
450	455	460	
Arg Glu Pro Thr Ala Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln			
465	470	475	480
Gln Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu Pro Leu His			
485	490	495	

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Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg
 500 505 510
 Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ala Cys Ser Arg Tyr Phe Pro
 515 520 525
 Thr Ala Lys Arg Ala Thr Arg Ala Gln Asp Ile Arg Asn Gly Asp Pro
 530 535 540
 Leu Thr His Cys Ser Asp Leu His His Asp Asn His His Gly His Ser
 545 550 555 560
 Pro Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser Ser Thr Phe Leu
 565 570 575
 Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr Trp Gln Phe Gln
 580 585 590
 Arg Arg Asn Glu Glu Arg Lys Glu Ile Arg Val Asp Asp His Ile
 595 600 605
 Ile Arg Thr Asp Gln Gly Leu Leu Leu Arg Ser Leu Gln Gln Lys Asp
 610 615 620
 Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly Phe Ile Gln Thr
 625 630 635 640
 Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu His Leu Glu Glu
 645 650 655
 Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys Thr Lys Glu Met
 660 665 670
 Ser Asn Ser Met Thr Pro Ser Gln Lys Val Trp Tyr Arg Asp Phe Met
 675 680 685
 Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp Glu Phe Cys Glu
 690 695 700
 Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln Arg Pro Gly His
 705 710 715 720
 Thr Pro Gly Asn Ser Asn Lys Trp Lys His Leu Gln Glu Asn Lys Lys
 725 730 735
 Gly Arg Asn Arg Arg Thr His Glu Phe Glu Arg Ala Pro Arg Ser Val
 740 745 750
 Asp Ile Glu Gly Arg Met Asp Pro Lys Ser Cys Asp Lys Thr His Thr
 755 760 765
 Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val Phe
 770 775 780
 Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr Pro
 785 790 795 800
 Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu Val
 805 810 815
 Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys Thr
 820 825 830
 Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser Val
 835 840 845
 Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys Cys
 850 855 860
 Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile Ser
 865 870 875 880
 Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro Pro
 885 890 895
 Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu Val
 900 905 910

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Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn Gly
 915 920 925

Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser Asp
 930 935 940

Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg Trp
 945 950 955 960

Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu His
 965 970 975

Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 980 985 990

<210> SEQ ID NO 582

<211> LENGTH: 563

<212> TYPE: PRT

<213> ORGANISM: Homo sapiens

<400> SEQUENCE: 582

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

Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe Asn Gly Leu Ala
 20 25 30

Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser Arg
 35 40 45

Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asp Leu Val Asn
 50 55 60

Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg Arg
 65 70 75 80

Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys Glu Cys Ala Asn
 85 90 95

Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His Leu Tyr Ala Cys
 100 105 110

Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Ile Gly His
 115 120 125

His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn Ser His Phe Glu Asn
 130 135 140

Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu
 145 150 155 160

Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly
 165 170 175

Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile Arg
 180 185 190

Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Lys Phe Ile Ser
 195 200 205

Ala His Leu Ile Ser Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr
 210 215 220

Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys Ala
 225 230 235 240

Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His
 245 250 255

Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile
 260 265 270

Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu
 275 280 285

Gln Asp Val Phe Leu Met Asn Phe Lys Asp Pro Lys Asn Pro Val Val
 290 295 300

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Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala Val
305 310 315 320

Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr
325 330 335

Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly Arg
340 345 350

Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly
355 360 365

Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala Arg
370 375 380

Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Met Asn Asn Arg Pro
385 390 395 400

Ile Val Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val
405 410 415

Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly
420 425 430

Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile Pro Lys Glu Thr
435 440 445

Trp Tyr Asp Leu Glu Glu Val Leu Leu Glu Met Thr Val Phe Arg
450 455 460

Glu Pro Thr Ala Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln
465 470 475 480

Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu Pro Leu His Arg
485 490 495

Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp
500 505 510

Pro Tyr Cys Ala Trp Asp Gly Ser Ala Cys Ser Arg Tyr Phe Pro Thr
515 520 525

Ala Lys Ala Arg Thr Arg Ala Gln Asp Ile Arg Asn Gly Asp Pro Leu
530 535 540

Thr His Cys Ser Asp Gly Gly Ile Glu Gly Arg Met Asp His His His
545 550 555 560

His His His

<210> SEQ ID NO 583
<211> LENGTH: 563
<212> TYPE: PRT
<213> ORGANISM: Mus musculus (Mouse)

<400> SEQUENCE: 583

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

Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe Asn Gly Leu Ala
20 25 30

Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser Arg
35 40 45

Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asn Leu Val Asn
50 55 60

Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg Arg
65 70 75 80

Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys Glu Cys Ala Asn
85 90 95

Phe Ile Lys Val Leu Glu Ala Tyr Asn Gln Thr His Leu Tyr Ala Cys
100 105 110

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Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Val Gly His
115 120 125

His Pro Glu Asp Asn Ile Phe Lys Leu Gln Asp Ser His Phe Glu Asn
130 135 140

Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu
145 150 155 160

Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly
165 170 175

Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile Arg
180 185 190

Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile Ser
195 200 205

Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr
210 215 220

Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys Ala
225 230 235 240

Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His
245 250 255

Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile
260 265 270

Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu
275 280 285

Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Ile Val
290 295 300

Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala Val
305 310 315 320

Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr
325 330 335

Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly Arg
340 345 350

Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly
355 360 365

Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala Arg
370 375 380

Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg Pro
385 390 395 400

Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val
405 410 415

Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly
420 425 430

Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val Pro Lys Glu Thr
435 440 445

Trp His Asp Leu Glu Glu Ile Leu Leu Glu Glu Met Thr Val Phe Arg
450 455 460

Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln Gln
465 470 475 480

Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu Pro Leu His Arg
485 490 495

Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp
500 505 510

Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro Thr
515 520 525

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Ala Lys Ala Arg Thr Arg Ala Gln Asp Ile Arg Asn Gly Asp Pro Leu
 530 535 540

Thr His Cys Ser Asp Gly Gly Ile Glu Gly Arg Met Asp His His His
 545 550 555 560

His His His

<210> SEQ ID NO 584

<211> LENGTH: 563

<212> TYPE: PRT

<213> ORGANISM: Rattus norvegicus (Rat)

<400> SEQUENCE: 584

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

Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe Asn Gly Leu Ala
 20 25 30

Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser Arg
 35 40 45

Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asn Leu Val Asn
 50 55 60

Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg Arg
 65 70 75 80

Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys Glu Cys Ala Asn
 85 90 95

Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His Leu Tyr Ala Cys
 100 105 110

Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Val Gly His
 115 120 125

His Pro Glu Asp Asn Ile Phe Lys Leu Gln Asp Ser His Phe Glu Asn
 130 135 140

Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu
 145 150 155 160

Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly
 165 170 175

Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile Arg
 180 185 190

Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile Ser
 195 200 205

Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr
 210 215 220

Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys Ala
 225 230 235 240

Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His
 245 250 255 260

Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile
 260 265 270

Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu
 275 280 285

Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Ile Val
 290 295 300

Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala Val
 305 310 315 320

Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr
 325 330 335

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Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly Arg
 340 345 350
 Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly
 355 360 365
 Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala Arg
 370 375 380
 Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg Pro
 385 390 395 400
 Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val
 405 410 415
 Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly
 420 425 430
 Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val Pro Lys Glu Thr
 435 440 445
 Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met Thr Val Phe Arg
 450 455 460
 Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln Gln
 465 470 475 480
 Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu Pro Leu His Arg
 485 490 495
 Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp
 500 505 510
 Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro Thr
 515 520 525
 Ala Lys Ala Arg Thr Arg Ala Gln Asp Ile Arg Asn Gly Asp Pro Leu
 530 535 540
 Thr His Cys Ser Asp Gly Gly Ile Glu Gly Arg Met Asp His His His
 545 550 555 560
 His His His

<210> SEQ ID NO 585
 <211> LENGTH: 563
 <212> TYPE: PRT
 <213> ORGANISM: Canis lupus familiaris (dog)

<400> SEQUENCE: 585

Asn Tyr Gln Asn Gly Lys Asn Asn Val Pro Arg Leu Lys Leu Ser Tyr
 1 5 10 15
 Lys Glu Met Leu Glu Ser Asn Ser Val Ile Thr Phe Asn Gly Leu Ala
 20 25 30
 Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser Arg
 35 40 45
 Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asn Leu Val Asn
 50 55 60
 Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg Arg
 65 70 75 80
 Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Gln Lys Glu Cys Ala Asn
 85 90 95
 Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His Leu Tyr Ala Cys
 100 105 110
 Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Ile Gly His
 115 120 125
 His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asp Ser His Phe Glu Asn
 130 135 140

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Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu
145 150 155 160

Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly
165 170 175

Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile Arg
180 185 190

Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile Ser
195 200 205

Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr
210 215 220

Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Thr Gly Lys Ala
225 230 235 240

Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His
245 250 255

Arg Ser Leu Val Asn Lys Trp Thr Phe Leu Lys Ala Arg Leu Ile
260 265 270

Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu
275 280 285

Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Ile Val
290 295 300

Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala Val
305 310 315 320

Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr
325 330 335

Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly Arg
340 345 350

Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly
355 360 365

Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala Arg
370 375 380

Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg Pro
385 390 395 400

Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val
405 410 415

Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly
420 425 430

Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile Pro Lys Glu Thr
435 440 445

Trp His Asp Leu Glu Glu Val Leu Leu Glu Met Thr Val Phe Arg
450 455 460

Glu Pro Thr Pro Ile Ser Ala Met Glu Leu Ser Thr Lys Gln His Gln
465 470 475 480

Leu Tyr Ala Gly Ser Pro Ala Gly Leu Ala Gln Leu Pro Leu Gln Arg
485 490 495

Cys Ala Ala Tyr Gly Arg Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp
500 505 510

Pro Tyr Cys Ala Trp Asp Gly Ala Ala Cys Ser Arg Tyr Phe Pro Ala
515 520 525

Ala Lys Ala Arg Thr Arg Ala Gln Asp Ile Arg Asn Gly Asp Pro Leu
530 535 540

Thr His Cys Ser Asp Gly Gly Ile Glu Gly Arg Met Asp His His His
545 550 555 560

His His His

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<210> SEQ ID NO 586
 <211> LENGTH: 563
 <212> TYPE: PRT
 <213> ORGANISM: Macaca fascicularis (Cynomolgus monkey)
 <400> SEQUENCE: 586

Asn	Tyr	Gln	Asn	Gly	Lys	Asn	Asn	Val	Pro	Arg	Leu	Lys	Leu	Ser	Tyr
1					5			10				15			
Lys	Glu	Met	Leu	Glu	Ser	Asn	Asn	Val	Ile	Thr	Phe	Asn	Gly	Leu	Ala
		20				25						30			
Asn	Ser	Ser	Ser	Tyr	His	Thr	Phe	Leu	Leu	Asp	Glu	Glu	Arg	Ser	Arg
	35					40					45				
Leu	Tyr	Val	Gly	Ala	Lys	Asp	His	Ile	Phe	Ser	Phe	Asn	Leu	Val	Asn
	50				55						60				
Ile	Lys	Asp	Phe	Gln	Lys	Ile	Val	Trp	Pro	Val	Ser	Tyr	Thr	Arg	Arg
65					70				75			80			
Asp	Glu	Cys	Lys	Trp	Ala	Gly	Lys	Asp	Ile	Leu	Lys	Glu	Cys	Ala	Asn
	85					90						95			
Phe	Ile	Lys	Val	Leu	Lys	Ala	Tyr	Asn	Gln	Thr	His	Leu	Tyr	Ala	Cys
	100					105						110			
Gly	Thr	Gly	Ala	Phe	His	Pro	Ile	Cys	Thr	Tyr	Ile	Glu	Ile	Gly	His
	115					120					125				
His	Pro	Glu	Asp	Asn	Ile	Phe	Lys	Leu	Glu	Asn	Ser	His	Phe	Glu	Asn
	130					135					140				
Gly	Arg	Gly	Lys	Ser	Pro	Tyr	Asp	Pro	Lys	Leu	Leu	Thr	Ala	Ser	Leu
145					150				155			160			
Leu	Ile	Asp	Gly	Glu	Leu	Tyr	Ser	Gly	Thr	Ala	Ala	Asp	Phe	Met	Gly
	165					170						175			
Arg	Asp	Phe	Ala	Ile	Phe	Arg	Thr	Leu	Gly	His	His	His	Pro	Ile	Arg
	180					185					190				
Thr	Glu	Gln	His	Asp	Ser	Arg	Trp	Leu	Asn	Asp	Pro	Arg	Phe	Ile	Ser
	195					200					205				
Ala	His	Leu	Ile	Pro	Glu	Ser	Asp	Asn	Pro	Glu	Asp	Asp	Lys	Val	Tyr
	210					215					220				
Phe	Phe	Phe	Arg	Glu	Asn	Ala	Ile	Asp	Gly	Glu	His	Ser	Gly	Lys	Ala
225					230				235			240			
Thr	His	Ala	Arg	Ile	Gly	Gln	Ile	Cys	Lys	Asn	Asp	Phe	Gly	Gly	His
	245					250					255				
Arg	Ser	Leu	Val	Asn	Lys	Trp	Thr	Thr	Phe	Leu	Lys	Ala	Arg	Leu	Ile
	260					265					270				
Cys	Ser	Val	Pro	Gly	Pro	Asn	Gly	Ile	Asp	Thr	His	Phe	Asp	Glu	Leu
	275					280					285				
Gln	Asp	Val	Phe	Leu	Met	Asn	Phe	Lys	Asp	Pro	Lys	Asn	Pro	Ile	Val
	290					295					300				
Tyr	Gly	Val	Phe	Thr	Thr	Ser	Ser	Asn	Ile	Phe	Lys	Gly	Ser	Ala	Val
305						310				315			320		
Cys	Met	Tyr	Ser	Met	Ser	Asp	Val	Arg	Arg	Val	Phe	Leu	Gly	Pro	Tyr
	325					330					335				
Ala	His	Arg	Asp	Gly	Pro	Asn	Tyr	Gln	Trp	Val	Pro	Tyr	Gln	Gly	Arg
	340					345					350				
Val	Pro	Tyr	Pro	Arg	Pro	Gly	Thr	Cys	Pro	Ser	Lys	Thr	Phe	Gly	Gly
	355					360					365				
Phe	Asp	Ser	Thr	Lys	Asp	Leu	Pro	Asp	Asp	Val	Ile	Thr	Phe	Ala	Arg

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370	375	380
Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg Pro		
385	390	395
		400
Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val		
405	410	415
Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly		
420	425	430
Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile Pro Lys Glu Thr		
435	440	445
Trp His Asp Leu Glu Glu Val Leu Leu Glu Met Thr Val Phe Arg		
450	455	460
Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln Gln		
465	470	475
		480
Leu Tyr Ile Gly Ser Thr Ala Gly Ile Ala Gln Leu Pro Leu His Arg		
485	490	495
Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp		
500	505	510
Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro Thr		
515	520	525
Ala Lys Ala Arg Thr Arg Ala Gln Asp Ile Arg Asn Gly Asp Pro Leu		
530	535	540
Thr His Cys Ser Asp Gly Gly Ile Glu Gly Arg Met Asp His His His		
545	550	555
		560
His His His		

<210> SEQ ID NO 587

<211> LENGTH: 563

<212> TYPE: PRT

<213> ORGANISM: Sus scrofa (Pig)

<400> SEQUENCE: 587

Asn Tyr Gln Asn Gly Lys Asn Asn Val Pro Arg Leu Lys Leu Ser Tyr		
1	5	10
		15
Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe Asn Gly Leu Ala		
20	25	30
Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser Arg		
35	40	45
Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asn Leu Val Asn		
50	55	60
Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg Arg		
65	70	75
		80
Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys Glu Cys Ala Asn		
85	90	95
Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His Leu Tyr Ala Cys		
100	105	110
Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Ile Gly His		
115	120	125
His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asp Ser His Phe Glu Asn		
130	135	140
Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu		
145	150	155
		160
Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly		
165	170	175
Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile Arg		

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180	185	190
Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile Ser		
195	200	205
Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr		
210	215	220
Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Thr Gly Lys Ala		
225	230	235
240		
Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His		
245	250	255
Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile		
260	265	270
Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu		
275	280	285
Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Val Val		
290	295	300
Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala Val		
305	310	315
320		
Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr		
325	330	335
Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly Arg		
340	345	350
Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly		
355	360	365
Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala Arg		
370	375	380
Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg Pro		
385	390	395
400		
Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val		
405	410	415
Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly		
420	425	430
Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile Pro Lys Glu Thr		
435	440	445
Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met Thr Val Phe Arg		
450	455	460
Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln Gln		
465	470	475
480		
Leu Tyr Val Gly Ser Ala Ala Gly Val Ala Gln Leu Pro Leu His Arg		
485	490	495
Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp		
500	505	510
Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro Thr		
515	520	525
Ala Lys Ala Arg Thr Arg Ala Gln Asp Ile Arg Asn Gly Asp Pro Leu		
530	535	540
Thr His Cys Ser Asp Gly Gly Ile Glu Gly Arg Met Asp His His His		
545	550	555
560		
His His His		

<210> SEQ ID NO 588

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: artificial

<220> FEATURE:

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<223> OTHER INFORMATION: antibody sequence
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (3)..(3)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (5)..(5)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 588

Ser Tyr Xaa Met Xaa
1 5

<210> SEQ ID NO 589
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: artificial
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (5)..(5)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 589

Ser Tyr Ala Met Xaa
1 5

<210> SEQ ID NO 590
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: artificial
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (4)..(4)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (15)..(15)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 590

Ala Ile Gly Xaa Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Xaa Gly
1 5 10 15

<210> SEQ ID NO 591
<211> LENGTH: 16
<212> TYPE: PRT
<213> ORGANISM: artificial
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (4)..(4)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 591

Ala Ile Gly Xaa Gly Gly Asp Thr Tyr Tyr Ala Asp Ser Val Lys Gly
1 5 10 15

<210> SEQ ID NO 592
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: artificial
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<220> FEATURE:
<221> NAME/KEY: site

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<222> LOCATION: (8)..(8)
 <223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid
 <220> FEATURE:
 <221> NAME/KEY: site
 <222> LOCATION: (10)..(10)
 <223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 592

Gly Ile Ser Trp Asn Ser Gly Xaa Ile Xaa Tyr Ala Asp Ser Val Lys
 1 5 10 15

Gly

<210> SEQ ID NO 593
 <211> LENGTH: 17
 <212> TYPE: PRT
 <213> ORGANISM: artificial
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <220> FEATURE:
 <221> NAME/KEY: site
 <222> LOCATION: (10)..(10)
 <223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 593

Gly Ile Ser Trp Asn Ser Gly Trp Ile Xaa Tyr Ala Asp Ser Val Lys
 1 5 10 15

Gly

<210> SEQ ID NO 594
 <211> LENGTH: 12
 <212> TYPE: PRT
 <213> ORGANISM: artificial
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <220> FEATURE:
 <221> NAME/KEY: site
 <222> LOCATION: (12)..(12)
 <223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 594

Arg Asp Asp Tyr Thr Ser Arg Asp Ala Phe Asp Xaa
 1 5 10

<210> SEQ ID NO 595
 <211> LENGTH: 14
 <212> TYPE: PRT
 <213> ORGANISM: artificial
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <220> FEATURE:
 <221> NAME/KEY: site
 <222> LOCATION: (6)..(6)
 <223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 595

Thr Gly Ser Ser Ser Xaa Ile Gly Ala Gly Tyr Asp Val His
 1 5 10

<210> SEQ ID NO 596
 <211> LENGTH: 7
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <220> FEATURE:
 <221> NAME/KEY: site
 <222> LOCATION: (5)..(5)
 <223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

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<400> SEQUENCE: 596

Tyr Asp Asp Leu Xaa Pro Ser
1 5

<210> SEQ ID NO 597
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: artificial
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (2)..(2)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 597

Gly Xaa Ser Asn Arg Pro Ser
1 5

<210> SEQ ID NO 598
<211> LENGTH: 12
<212> TYPE: PRT
<213> ORGANISM: artificial
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (1)..(1)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (9)..(11)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 598

Xaa Ala Trp Asp Asp Ser Leu Asn Xaa Xaa Xaa Val
1 5 10

<210> SEQ ID NO 599
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: artificial
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (1)..(1)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (4)..(4)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid
<220> FEATURE:
<221> NAME/KEY: site
<222> LOCATION: (6)..(6)
<223> OTHER INFORMATION: Xaa can be any naturally occurring amino acid

<400> SEQUENCE: 599

Xaa Ser Tyr Xaa Gly Xaa Asn Pro Tyr Val Val
1 5 10

<210> SEQ ID NO 600
<211> LENGTH: 750
<212> TYPE: PRT
<213> ORGANISM: Homo sapiens

<400> SEQUENCE: 600

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

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Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe Asn Gly Leu Ala Asn
 20 25 30
 Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser Arg Leu
 35 40 45
 Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asp Leu Val Asn Ile
 50 55 60
 Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg Arg Asp
 65 70 75 80
 Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys Glu Cys Ala Asn Phe
 85 90 95
 Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His Leu Tyr Ala Cys Gly
 100 105 110
 Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Ile Gly His His
 115 120 125
 Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn Ser His Phe Glu Asn Gly
 130 135 140
 Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu Leu
 145 150 155 160
 Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly Arg
 165 170 175
 Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile Arg Thr
 180 185 190
 Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Lys Phe Ile Ser Ala
 195 200 205
 His Leu Ile Ser Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr Phe
 210 215 220
 Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys Ala Thr
 225 230 235 240
 His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His Arg
 245 250 255
 Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile Cys
 260 265 270
 Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu Gln
 275 280 285
 Asp Val Phe Leu Met Asn Phe Lys Asp Pro Lys Asn Pro Val Val Tyr
 290 295 300
 Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala Val Cys
 305 310 315 320
 Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr Ala
 325 330 335
 His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly Arg Val
 340 345 350
 Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly Phe
 355 360 365
 Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala Arg Ser
 370 375 380
 His Pro Ala Met Tyr Asn Pro Val Phe Pro Met Asn Asn Arg Pro Ile
 385 390 395 400
 Val Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val Asp
 405 410 415
 Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly Thr
 420 425 430
 Asp Val Gly Thr Val Leu Lys Val Val Ser Ile Pro Lys Glu Thr Trp

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435	440	445
Tyr Asp Leu Glu Glu Val Leu Leu Glu Glu Met Thr Val Phe Arg Glu		
450	455	460
Pro Thr Ala Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln Gln Leu		
465	470	475
Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu Pro Leu His Arg Cys		
485	490	495
Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp Pro		
500	505	510
Tyr Cys Ala Trp Asp Gly Ser Ala Cys Ser Arg Tyr Phe Pro Thr Ala		
515	520	525
Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn Gly Asp Pro Leu Thr		
530	535	540
His Cys Ser Asp Leu His His Asp Asn His His Gly His Ser Pro Glu		
545	550	555
Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser Ser Thr Phe Leu Glu Cys		
565	570	575
Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr Trp Gln Phe Gln Arg Arg		
580	585	590
Asn Glu Glu Arg Lys Glu Glu Ile Arg Val Asp Asp His Ile Ile Arg		
595	600	605
Thr Asp Gln Gly Leu Leu Leu Arg Ser Leu Gln Gln Lys Asp Ser Gly		
610	615	620
Asn Tyr Leu Cys His Ala Val Glu His Gly Phe Ile Gln Thr Leu Leu		
625	630	635
Lys Val Thr Leu Glu Val Ile Asp Thr Glu His Leu Glu Glu Leu Leu		
645	650	655
His Lys Asp Asp Asp Gly Asp Gly Ser Lys Thr Lys Glu Met Ser Asn		
660	665	670
Ser Met Thr Pro Ser Gln Lys Val Trp Tyr Arg Asp Phe Met Gln Leu		
675	680	685
Ile Asn His Pro Asn Leu Asn Thr Met Asp Glu Phe Cys Glu Gln Val		
690	695	700
Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln Arg Pro Gly His Thr Pro		
705	710	715
Gly Asn Ser Asn Lys Trp Lys His Leu Gln Glu Asn Lys Lys Gly Arg		
725	730	735
Asn Arg Arg Thr His Glu Phe Glu Arg Ala Pro Arg Ser Val		
740	745	750

<210> SEQ ID NO 601

<211> LENGTH: 752

<212> TYPE: PRT

<213> ORGANISM: Mus musculus

<400> SEQUENCE: 601

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

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Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser Tyr Thr Arg Arg
65 70 75 80

Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys Glu Cys Ala Asn
85 90 95

Phe Ile Lys Val Leu Glu Ala Tyr Asn Gln Thr His Leu Tyr Ala Cys
100 105 110

Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile Glu Val Gly His
115 120 125

His Pro Glu Asp Asn Ile Phe Lys Leu Gln Asp Ser His Phe Glu Asn
130 135 140

Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu
145 150 155 160

Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly
165 170 175

Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile Arg
180 185 190

Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile Ser
195 200 205

Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr
210 215 220

Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys Ala
225 230 235 240

Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His
245 250 255

Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile
260 265 270

Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu
275 280 285

Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Ile Val
290 295 300

Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala Val
305 310 315 320

Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr
325 330 335

Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly Arg
340 345 350

Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly
355 360 365

Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala Arg
370 375 380

Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg Pro
385 390 395 400

Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val
405 410 415

Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly
420 425 430

Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val Pro Lys Glu Thr
435 440 445

Trp His Asp Leu Glu Glu Val Leu Leu Glu Met Thr Val Phe Arg
450 455 460

Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln Gln
465 470 475 480

Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu Pro Leu His Arg

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485	490	495
Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp		
500	505	510
Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro Thr		
515	520	525
Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn Gly Asp Pro Leu		
530	535	540
Thr His Cys Ser Asp Leu Gln His His Asp Asn His His Gly Pro Ser		
545	550	555
Leu Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser Ser Thr Phe Leu		
565	570	575
Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr Trp Gln Phe Gln		
580	585	590
Arg Arg Asn Glu Asp Arg Lys Glu Glu Ile Arg Met Gly Asp His Ile		
595	600	605
Ile Arg Thr Glu Gln Gly Leu Leu Leu Arg Ser Leu Gln Lys Lys Asp		
610	615	620
Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly Phe Met Gln Thr		
625	630	635
Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu His Leu Glu Glu		
645	650	655
Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys Ile Lys Glu Met		
660	665	670
Ser Ser Ser Met Thr Pro Ser Gln Lys Val Trp Tyr Arg Asp Phe Met		
675	680	685
Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp Glu Phe Cys Glu		
690	695	700
Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln Arg Pro Gly His		
705	710	715
Ser Gln Gly Ser Ser Asn Lys Trp Lys His Met Gln Glu Ser Lys Lys		
725	730	735
Gly Arg Asn Arg Arg Thr His Glu Phe Glu Arg Ala Pro Arg Ser Val		
740	745	750

<210> SEQ ID NO 602

<211> LENGTH: 772

<212> TYPE: PRT

<213> ORGANISM: Macaca fascicularis

<400> SEQUENCE: 602

Met Gly Trp Leu Thr Arg Ile Val Cys Leu Phe Trp Gly Val Leu Leu		
1	5	10
15		
Thr Ala Arg Ala Asn Tyr Gln Asn Gly Lys Asn Asn Val Pro Arg Leu		
20	25	30
30		
Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe		
35	40	45
45		
Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu		
50	55	60
60		
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe		
65	70	75
75		
80		
Asn Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser		
85	90	95
95		
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys		
100	105	110

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-continued

Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His
 115 120 125

Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile
 130 135 140

Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asn Ser
 145 150 155 160

His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu
 165 170 175

Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
 180 185 190

Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
 195 200 205

His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
 210 215 220

Arg Phe Ile Ser Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp
 225 230 235 240

Asp Lys Val Tyr Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
 245 250 255

Ser Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
 260 265 270

Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Phe Leu Lys
 275 280 285

Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
 290 295 300

Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Phe Lys Asp Pro Lys
 305 310 315 320

Asn Pro Ile Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
 325 330 335

Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
 340 345 350

Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
 355 360 365

Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
 370 375 380

Thr Phe Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
 385 390 395 400

Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile
 405 410 415

Asn Asn Arg Pro Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
 420 425 430

Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val
 435 440 445

Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile
 450 455 460

Pro Lys Glu Thr Trp His Asp Leu Glu Val Leu Leu Glu Glu Met
 465 470 475 480

Thr Val Phe Arg Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr
 485 490 495

Lys Gln Gln Gln Leu Tyr Ile Gly Ser Thr Ala Gly Ile Ala Gln Leu
 500 505 510

Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys
 515 520 525

Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg

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530	535	540													
Tyr	Phe	Pro	Thr	Ala	Lys	Arg	Arg	Thr	Arg	Arg	Gln	Asp	Ile	Arg	Asn
545					550			555						560	
Gly	Asp	Pro	Leu	Thr	His	Cys	Ser	Asp	Leu	Gln	His	His	Asp	Asn	His
					565			570					575		
His	Gly	His	Ser	Pro	Glu	Glu	Arg	Ile	Ile	Tyr	Gly	Val	Glu	Asn	Ser
					580			585				590			
Ser	Thr	Phe	Leu	Glu	Cys	Ser	Pro	Lys	Ser	Gln	Arg	Ala	Leu	Val	Tyr
					595			600			605				
Trp	Gln	Phe	Gln	Arg	Arg	Asn	Glu	Glu	Arg	Lys	Glu	Glu	Ile	Arg	Val
					610			615			620				
Asp	Asp	His	Ile	Ile	Arg	Thr	Asp	Gln	Gly	Leu	Leu	Leu	Arg	Ser	Leu
					625			630			635			640	
Gln	Arg	Lys	Asp	Ser	Gly	Ser	Tyr	Leu	Cys	His	Ala	Val	Glu	His	Gly
					645			650			655				
Phe	Ile	Gln	Thr	Leu	Leu	Lys	Val	Thr	Leu	Glu	Val	Ile	Asp	Thr	Glu
					660			665			670				
His	Leu	Glu	Glu	Leu	Leu	His	Lys	Asp	Asp	Asp	Gly	Asp	Gly	Ser	Lys
					675			680			685				
Thr	Lys	Glu	Met	Ser	Asn	Ser	Met	Thr	Pro	Ser	Gln	Lys	Val	Trp	Tyr
					690			695			700				
Arg	Asp	Phe	Met	Gln	Leu	Ile	Asn	His	Pro	Asn	Leu	Asn	Thr	Met	Asp
					705			710			715			720	
Glu	Phe	Cys	Glu	Gln	Val	Trp	Lys	Arg	Asp	Arg	Lys	Gln	Arg	Arg	Gln
					725			730			735				
Arg	Pro	Gly	His	Thr	Gln	Gly	Asn	Ser	Asn	Lys	Trp	Lys	His	Leu	Gln
					740			745			750				
Glu	Asn	Lys	Lys	Gly	Arg	Asn	Arg	Arg	Thr	His	Glu	Phe	Glu	Arg	Ala
					755			760			765				
Pro	Arg	Ser	Val												
			770												

<210> SEQ ID NO 603

<211> LENGTH: 752

<212> TYPE: PRT

<213> ORGANISM: Rattus norvegicus

<400> SEQUENCE: 603

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

Lys	Glu	Met	Leu	Glu	Ser	Asn	Asn	Val	Ile	Thr	Phe	Asn	Gly	Leu	Ala
					20			25			30				

Asn	Ser	Ser	Ser	Tyr	His	Thr	Phe	Leu	Leu	Asp	Glu	Glu	Arg	Ser	Arg
					35			40			45				

Leu	Tyr	Val	Gly	Ala	Lys	Asp	His	Ile	Phe	Ser	Phe	Asn	Leu	Val	Asn
					50			55			60				

Ile	Lys	Asp	Phe	Gln	Lys	Ile	Val	Trp	Pro	Val	Ser	Tyr	Thr	Arg	Arg
					65			70			75			80	

Asp	Glu	Cys	Lys	Trp	Ala	Gly	Lys	Asp	Ile	Leu	Lys	Glu	Cys	Ala	Asn
					85			90			95				

Phe	Ile	Lys	Val	Leu	Lys	Ala	Tyr	Asn	Gln	Thr	His	Leu	Tyr	Ala	Cys
					100			105			110				

Gly	Thr	Gly	Ala	Phe	His	Pro	Ile	Cys	Thr	Tyr	Ile	Glu	Val	Gly	His
					115			120			125				

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His Pro Glu Asp Asn Ile Phe Lys Leu Gln Asp Ser His Phe Glu Asn
 130 135 140
 Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu
 145 150 155 160
 Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly
 165 170 175
 Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His His Pro Ile Arg
 180 185 190
 Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile Ser
 195 200 205
 Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr
 210 215 220
 Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys Ala
 225 230 235 240
 Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His
 245 250 255
 Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile
 260 265 270
 Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu
 275 280 285
 Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Ile Val
 290 295 300
 Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys Gly Ser Ala Val
 305 310 315 320
 Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr
 325 330 335
 Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Tyr Gln Gly Arg
 340 345 350
 Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly
 355 360 365
 Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile Thr Phe Ala Arg
 370 375 380
 Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile Asn Asn Arg Pro
 385 390 395 400
 Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val
 405 410 415
 Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly
 420 425 430
 Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Val Pro Lys Glu Thr
 435 440 445
 Trp His Asp Leu Glu Glu Val Leu Leu Glu Met Thr Val Phe Arg
 450 455 460
 Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln Gln
 465 470 475 480
 Leu Tyr Ile Gly Ser Thr Ala Gly Val Ala Gln Leu Pro Leu His Arg
 485 490 495
 Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp
 500 505 510
 Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro Thr
 515 520 525
 Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn Gly Asp Pro Leu
 530 535 540
 Thr His Cys Ser Asp Leu Gln His His Asp Asn His His Gly His Ser

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545	550	555	560
Leu Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser Ser Thr Phe Leu			
565	570	575	
Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr Trp Gln Phe Gln			
580	585	590	
Arg Arg Asn Glu Asp Arg Lys Glu Ile Arg Val Gly Asp His Ile			
595	600	605	
Ile Arg Thr Glu Gln Gly Leu Leu Leu Arg Ser Leu Gln Lys Lys Asp			
610	615	620	
Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly Phe Met Gln Thr			
625	630	635	640
Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu His Leu Glu Glu			
645	650	655	
Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys Thr Lys Glu Met			
660	665	670	
Ser Ser Ser Met Thr Pro Ser Gln Lys Val Trp Tyr Arg Asp Phe Met			
675	680	685	
Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp Glu Phe Cys Glu			
690	695	700	
Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln Arg Pro Gly His			
705	710	715	720
Ser Gln Gly Ser Ser Asn Lys Trp Lys His Met Gln Glu Ser Lys Lys			
725	730	735	
Gly Arg Asn Arg Arg Thr His Glu Phe Glu Arg Ala Pro Arg Ser Val			
740	745	750	

<210> SEQ ID NO 604

<211> LENGTH: 772

<212> TYPE: PRT

<213> ORGANISM: Sus scrofa

<400> SEQUENCE: 604

1	5	10	15
Met Gly Trp Phe Ser Arg Ile Val Cys Leu Phe Trp Gly Val Leu Leu			
20	25	30	
Thr Ala Arg Ala Asn Tyr Gln Asn Gly Lys Asn Asn Val Pro Arg Leu			
35	40	45	
Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe			
50	55	60	
Asn Gly Leu Ala Asn Ser Ser Tyr His Thr Phe Leu Leu Asp Glu			
65	70	75	80
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe			
85	90	95	
Asn Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser			
100	105	110	
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Lys			
115	120	125	
Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His			
130	135	140	
Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile			
145	150	155	160
Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asp Ser			
165	170	175	
His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu			

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Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala
 180 185 190
 Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
 195 200 205
 His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
 210 215 220
 Arg Phe Ile Ser Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp
 225 230 235 240
 Asp Lys Val Tyr Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
 245 250 255
 Thr Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
 260 265 270
 Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
 275 280 285
 Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
 290 295 300
 Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys
 305 310 315 320
 Asn Pro Val Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
 325 330 335
 Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
 340 345 350
 Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
 355 360 365
 Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
 370 375 380
 Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
 385 390 395 400
 Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile
 405 410 415
 Asn Asn Arg Pro Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
 420 425 430
 Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val
 435 440 445
 Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile
 450 455 460
 Pro Lys Glu Thr Trp His Asp Leu Glu Val Leu Leu Glu Glu Met
 465 470 475 480
 Thr Val Phe Arg Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr
 485 490 495
 Lys Gln Gln Gln Leu Tyr Val Gly Ser Ala Ala Gly Val Ala Gln Leu
 500 505 510
 Pro Leu His Arg Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys
 515 520 525
 Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg
 530 535 540
 Tyr Phe Pro Thr Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn
 545 550 555 560
 Gly Asp Pro Leu Thr His Cys Ser Asp Leu Gln His His Asp Asn His
 565 570 575
 Arg Gly His Asn Phe Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser
 580 585 590
 Ser Thr Phe Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr

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595	600	605
Trp Gln Phe Gln Arg Arg Asn Glu Glu Arg Lys Glu Glu Ile Arg Val		
610	615	620
Asp Asp His Ile Ile Arg Thr Glu Gln Gly Leu Leu Leu Arg Ser Leu		
625	630	635
Gln Arg Lys Asp Ser Gly Ser Tyr Leu Cys His Ala Val Glu His Gly		
645	650	655
Phe Met Gln Thr Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu		
660	665	670
His Leu Glu Leu Leu His Lys Asp Asp Asp Gly Asp Ser Ser Lys		
675	680	685
Thr Lys Glu Met Ser Asn Ser Met Thr Pro Ser Gln Lys Ile Trp Tyr		
690	695	700
Arg Asp Phe Met Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp		
705	710	715
Glu Phe Cys Glu Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln		
725	730	735
Arg Pro Gly His Thr Gln Gly Asn Ser Asn Lys Trp Lys His Leu Gln		
740	745	750
Glu Asn Lys Lys Cys Arg Asn Arg Arg Thr His Glu Phe Glu Arg Ala		
755	760	765
Pro Arg Ser Val		
770		

<210> SEQ ID NO 605

<211> LENGTH: 772

<212> TYPE: PRT

<213> ORGANISM: Canis lupus familiaris

<400> SEQUENCE: 605

1	5	10	15
Met Gly Trp Leu Ala Arg Ile Ala Cys Leu Phe Trp Gly Val Leu Leu			
20	25	30	
Lys Leu Ser Tyr Lys Glu Met Leu Glu Ser Asn Ser Val Ile Thr Phe			
35	40	45	
Asn Gly Leu Ala Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu			
50	55	60	
Glu Arg Ser Arg Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe			
65	70	75	80
Asn Leu Val Asn Ile Lys Asp Phe Gln Lys Ile Val Trp Pro Val Ser			
85	90	95	
Tyr Thr Arg Arg Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Gln Lys			
100	105	110	
Glu Cys Ala Asn Phe Ile Lys Val Leu Lys Ala Tyr Asn Gln Thr His			
115	120	125	
Leu Tyr Ala Cys Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Ile			
130	135	140	
Glu Ile Gly His His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asp Ser			
145	150	155	160
His Phe Glu Asn Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu			
165	170	175	
Thr Ala Ser Leu Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala			
180	185	190	

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Asp Phe Met Gly Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly His His
 195 200 205
 His Pro Ile Arg Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro
 210 215 220
 Arg Phe Ile Ser Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp
 225 230 235 240
 Asp Lys Val Tyr Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His
 245 250 255
 Thr Gly Lys Ala Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp
 260 265 270
 Phe Gly Gly His Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys
 275 280 285
 Ala Arg Leu Ile Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His
 290 295 300
 Phe Asp Glu Leu Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys
 305 310 315 320
 Asn Pro Ile Val Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Lys
 325 330 335
 Gly Ser Ala Val Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe
 340 345 350
 Leu Gly Pro Tyr Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro
 355 360 365
 Tyr Gln Gly Arg Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys
 370 375 380
 Thr Phe Gly Gly Phe Asp Ser Thr Lys Asp Leu Pro Asp Asp Val Ile
 385 390 395 400
 Thr Phe Ala Arg Ser His Pro Ala Met Tyr Asn Pro Val Phe Pro Ile
 405 410 415
 Asn Asn Arg Pro Ile Met Ile Lys Thr Asp Val Asn Tyr Gln Phe Thr
 420 425 430
 Gln Ile Val Val Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val
 435 440 445
 Met Phe Ile Gly Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile
 450 455 460
 Pro Lys Glu Thr Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met
 465 470 475 480
 Thr Val Phe Arg Glu Pro Thr Pro Ile Ser Ala Met Glu Leu Ser Thr
 485 490 495
 Lys Gln His Gln Leu Tyr Ala Gly Ser Pro Ala Gly Leu Ala Gln Leu
 500 505 510
 Pro Leu Gln Arg Cys Ala Ala Tyr Gly Arg Ala Cys Ala Glu Cys Cys
 515 520 525
 Leu Ala Arg Asp Pro Tyr Cys Ala Trp Asp Gly Ala Ala Cys Ser Arg
 530 535 540
 Tyr Phe Pro Ala Ala Lys Arg Arg Thr Arg Arg Gln Asp Ile Arg Asn
 545 550 555 560
 Gly Asp Pro Leu Thr His Cys Ser Asp Leu Gln His His Asp Asn His
 565 570 575
 His Ser His Ser Leu Glu Glu Arg Ile Ile Tyr Gly Val Glu Asn Ser
 580 585 590
 Ser Thr Phe Leu Glu Cys Ser Pro Lys Ser Gln Arg Ala Leu Val Tyr
 595 600 605
 Trp Gln Phe Gln Arg Arg Asn Glu Glu Arg Lys Glu Glu Ile Arg Val

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610	615	620
Asp Asp His Ile Ile Arg Thr Glu Gln Gly Leu Leu Leu Arg Ser Leu		
625	630	635
Gln Arg Lys Asp Ser Gly Asn Tyr Leu Cys His Ala Val Glu His Gly		
645	650	655
Phe Met Gln Thr Leu Leu Lys Val Thr Leu Glu Val Ile Asp Thr Glu		
660	665	670
His Leu Glu Leu Leu His Lys Asp Asp Asp Gly Asp Gly Ser Lys		
675	680	685
Thr Lys Glu Ile Ser Asn Ser Met Thr Pro Ser Gln Lys Val Trp Tyr		
690	695	700
Arg Asp Phe Met Gln Leu Ile Asn His Pro Asn Leu Asn Thr Met Asp		
705	710	715
Glu Phe Cys Glu Gln Val Trp Lys Arg Asp Arg Lys Gln Arg Arg Gln		
725	730	735
Arg Pro Gly His Thr Gln Gly Asn Ser Asn Lys Trp Lys His Leu Gln		
740	745	750
Glu Asn Lys Lys Gly Arg Asn Arg Arg Thr His Glu Phe Glu Arg Ala		
755	760	765
Pro Arg Ser Val		
770		

<210> SEQ ID NO 606

<400> SEQUENCE: 606

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<210> SEQ ID NO 607

<400> SEQUENCE: 607

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<210> SEQ ID NO 608

<400> SEQUENCE: 608

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<210> SEQ ID NO 609

<400> SEQUENCE: 609

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<210> SEQ ID NO 610

<400> SEQUENCE: 610

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<210> SEQ ID NO 611

<400> SEQUENCE: 611

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<210> SEQ ID NO 612

<400> SEQUENCE: 612

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<210> SEQ ID NO 800

<211> LENGTH: 117

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 800

Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Ley	Val	Gln	Pro	Gly	Gly
1														

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
20															

Tyr	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Ley	Glu	Trp	Val
35															

Ser	Thr	Ile	Ile	Lys	Ser	Gly	Gly	Tyr	Ala	Tyr	Tyr	Pro	Asp	Ser	Val
50															

Lys	Asp	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr
65															

Leu	Gln	Met	Ser	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
85															

Val	Arg	Gly	Gly	Gln	Gly	Ala	Met	Asp	Tyr	Trp	Gly	Gln	Gly	Thr	Thr
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Val Thr Val Ser Ser

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<210> SEQ ID NO 801
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 801

Ser Tyr Tyr Met Ser
1 5

<210> SEQ ID NO 802
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 802

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

Asp

<210> SEQ ID NO 803
<211> LENGTH: 8
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 803

Gly Gly Gln Gly Ala Met Asp Tyr
1 5

<210> SEQ ID NO 804
<211> LENGTH: 107
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 804

Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly
1 5 10 15Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Gly Asp Tyr
20 25 30Leu His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile
35 40 45Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Ala Arg Phe Ser Gly
50 55 60Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Thr Ser Leu Glu Pro
65 70 75 80Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Gly Tyr Ser Phe Pro Tyr
85 90 95Thr Phe Gly Gly Thr Lys Leu Glu Ile Lys
100 105

<210> SEQ ID NO 805
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence

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<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 805

Arg Ala Ser Gln Ser Ile Gly Asp Tyr Leu His	
1	5
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<210> SEQ ID NO 806

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 806

Tyr Ala Ser Gln Ser Ile Ser	
1	5

<210> SEQ ID NO 807

<211> LENGTH: 9

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 807

Gln Gln Gly Tyr Ser Phe Pro Tyr Thr	
1	5

<210> SEQ ID NO 808

<211> LENGTH: 351

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 808

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tcttgtgcgc ccagcggttt cacccttcagc agctactaca tgagctgggt ccgcacaggcc	120
cctggcaaag gacttgaatg ggtgtccacc atcatcaaga gcggcggtca cgcctactat	180
cccgacacgca tgaaggaccg gttcaccatc tccagagaca acagcaagaa caccctgtac	240
ctgcagatga gcagcgatgag agccgaggat accgcgtgt actactgtgt tagaggcgga	300
cagggcgcca tggattattt gggccaggga accacagtga ccgtgtcatc a	351

<210> SEQ ID NO 809

<211> LENGTH: 321

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 809

gagatttgcc tgacacagtc tccccccaca ctgtcttta gccctggcga aagagccaca	60
ctgagctgtt gaggcagcca gagcatcgcc gattacctgc actggtatca gcagaaggct	120
ggacaggccc ctcggctgtt gattaagtac gccagccagt ccatcagcgg catccctgcc	180
agattttctg gcagcggttc tggcaccat ttcaccctga ccatcaccag cctggAACCT	240
gaggacttcg ccgtgtacta ctggcagcag ggctacagct tcccctacac atttggcgga	300
ggcaccaagc tggaaatcaa a	321

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<210> SEQ ID NO 810

<211> LENGTH: 447

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 810

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
 1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
 20 25 30

Tyr Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45

Ser Thr Ile Ile Lys Ser Gly Gly Tyr Ala Tyr Tyr Pro Asp Ser Val
 50 55 60

Lys Asp Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
 65 70 75 80

Leu Gln Met Ser Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95

Val Arg Gly Gly Gln Gly Ala Met Asp Tyr Trp Gly Gln Gly Thr Thr
 100 105 110

Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu
 115 120 125

Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys
 130 135 140

Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser
 145 150 155 160

Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser
 165 170 175

Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser
 180 185 190

Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn
 195 200 205

Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His
 210 215 220

Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val
 225 230 235 240

Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
 245 250 255

Pro Glu Val Thr Cys Val Val Asp Val Ser His Glu Asp Pro Glu
 260 265 270

Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
 275 280 285

Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser
 290 295 300

Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
 305 310 315 320

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

Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
 340 345 350

Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
 355 360 365

Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn

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370 375 380

Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser
 385 390 395 400

Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg
 405 410 415

Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
 420 425 430

His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 435 440 445

<210> SEQ ID NO 811

<211> LENGTH: 214

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 811

Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly
 1 5 10 15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Gly Asp Tyr
 20 25 30

Leu His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile
 35 40 45

Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Ala Arg Phe Ser Gly
 50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Thr Ser Leu Glu Pro
 65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Gly Tyr Ser Phe Pro Tyr
 85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys Arg Thr Val Ala Ala
 100 105 110

Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
 115 120 125

Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
 130 135 140

Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
 145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
 165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
 180 185 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
 195 200 205

Phe Asn Arg Gly Glu Cys
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<210> SEQ ID NO 812

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 812

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tcttgtgccc ccagcggctt caccttcago agctactaca tgagctgggt ccgacaggcc 120

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cctggcaaag gacttgaatg ggtgtccacc atcatcaaga gcggcggcta cgctactat	180
cccgacacgc tgaaggaccg gttcaccatc tccagagaca acagcaagaa caccctgtac	240
ctgcagatga gcagcctgag agccgaggat accgcgtgt actactgtgt tagaggcgga	300
cagggcgcctt tggattattt gggccaggga accacagtga ccgtgtcatc agccagcacc	360
aaggggccca gcgtgttccc tctggccctt agcagcaaga gcacatctgg cgaaacagcc	420
gcctctggctt gcctcgtgaa ggactacttt cccgagcccc tgaccgtgtc ctggaaactct	480
ggcgctctga caagcggcgt gcacaccttt ccagccgtgc tgcaagagcag cggcgtgtac	540
tctctgagca gcgtcgtgac agtgcggcgc agtctctgg gcacccagac ctatctgc	600
aacgtgaacc acaagccccag caacaccaag gtggacaaga aggtggaaacc caagagctgc	660
gacaagaccc acacacctgtcc cccttgcctt gccccggaa tgctgggggg cccttcgtg	720
ttccctgttcc ccccaaagcc caaggacacc ctgatgatca gcccggacccc cgaagtgacc	780
tgcggtgggg tggatgtgtc ccacgaggac cctgaagtga agttcaattt gtacgtggac	840
ggcggtggaaag tgccacaacgc caagaccaag cctagagagg aacagtacaa cagcacctac	900
cgggtgggtt ccgtgtgtac agtgcgtgcac caggactggc tgaacggcaa agagtacaa	960
tgcacccgggtt ccaacaaggc cctgcgtgc cccatcgaga aaaccatcag caaggccaa	1020
ggccggccccc gcgaacccca ggtgtacaca ctggcccccga gcagggacga gctgaccaag	1080
aaccagggtgt ccctgacctg tctcgtaaaa gggttctacc cctccgatata cgccgtggaa	1140
tgggagagca acggccagcc cgagaacaac tacaagacca cccccctgt gctggacagc	1200
gacggctcat ttttcctgtt cagcaagctg accgtggaca agtccgggt gcagcaggc	1260
aacgtgttca gtcgtggcgt gatgcacgg gccctgcaca accactacac ccagaagtcc	1320
ctgagcctga gccctggcaa g	1341

<210> SEQ ID NO 813

<211> LENGTH: 642

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 813

gagattgtgc tgacacagtc tccggccaca ctgtcttta gccctggcga aagagccaca	60
ctgagctgta gagccagcca gaggatcgcc gattacctgc actggatatac gcagaaggct	120
ggacaggccc ctcggctgtt gattaagtac gccagccagt ccatcagccg catccctgcc	180
agatttctg gcagcggctc tggcaccgtat ttccatgtt ccatcaccag cctggaaacct	240
gaggacttcg ccgtgtacta ctggcagcgg ggttacagct tccctacac atttggcgga	300
ggccaccaagg tggaaatcaa acgaaccgtg gccgctccca gcgtgttcat cttccacact	360
agcgacgagc agtgcgtgtc cggcacagcc tctgtgtgtt gcctgtgaa caacttctac	420
cccccgagg ccaagggtca gtggaaagggtt gacaatgccc tgcaagagcgg caacagccag	480
gaaaggcgtga cggcgtggaa cagcaaggac tccacccataa gctggacccg caccctgacc	540
ctgagcaagg cggactacga gaagcacaag gtgtacccctt gcaagggttac ccaccaggc	600
ctgtcttagcc ccgtgacccaa gagttcaac cggggcgagt gt	642

<210> SEQ ID NO 814

<211> LENGTH: 117

<212> TYPE: PRT

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-continued

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 814

Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1							5		10				15		

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Pro	Phe	Ser	Ser	Tyr
								20		25		30			

Tyr	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Leu	Glu	Trp	Val
								35		40		45			

Ser	Thr	Ile	Ile	Lys	Ser	Gly	Gly	Tyr	Ala	Tyr	Tyr	Pro	Asp	Ser	Val
								50		55		60			

Lys	Asp	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr
								65		70		75		80	

Leu	Gln	Met	Ser	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
								85		90		95			

Val	Arg	Gly	Gly	Gln	Gly	Ala	Met	Asp	Tyr	Trp	Gly	Gln	Gly	Thr	Thr
							100		105		110				

Val	Thr	Val	Ser	Ser											
					115										

<210> SEQ ID NO 815

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 815

Ser	Tyr	Tyr	Met	Ser											
1				5											

<210> SEQ ID NO 816

<211> LENGTH: 17

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 816

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

Asp

<210> SEQ ID NO 817

<211> LENGTH: 8

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 817

Gly	Gly	Gln	Gly	Ala	Met	Asp	Tyr								
1					5										

<210> SEQ ID NO 818

<211> LENGTH: 107

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 818

Glu	Ile	Val	Leu	Thr	Gln	Ser	Pro	Ala	Thr	Leu	Ser	Leu	Ser	Pro	Gly
1															15

Glu	Arg	Ala	Thr	Leu	Ser	Cys	Arg	Ala	Ser	Gln	Ser	Ile	Gly	Asp	Tyr
	20														30

Leu	His	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Gln	Ala	Pro	Arg	Leu	Leu	Ile
	35														45

Lys	Tyr	Ala	Ser	Gln	Ser	Ile	Ser	Gly	Ile	Pro	Ala	Arg	Phe	Ser	Gly
	50														60

Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Thr	Ser	Leu	Glu	Pro
	65														80

Glu	Asp	Phe	Ala	Val	Tyr	Tyr	Cys	Gln	Gln	Gly	Tyr	Ser	Phe	Pro	Tyr
	85														95

Thr	Phe	Gly	Gly	Thr	Lys	Leu	Glu	Ile	Lys						
	100														105

<210> SEQ ID NO 819

<211> LENGTH: 11

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 819

Arg	Ala	Ser	Gln	Ser	Ile	Gly	Asp	Tyr	Leu	His
1										10

<210> SEQ ID NO 820

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 820

Tyr	Ala	Ser	Gln	Ser	Ile	Ser
1						5

<210> SEQ ID NO 821

<211> LENGTH: 9

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 821

Gln	Gln	Gly	Tyr	Ser	Phe	Pro	Tyr	Thr
1								5

<210> SEQ ID NO 822

<211> LENGTH: 351

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 822

gaagtgcagc tggtgaaatc tggcgaggta ctgggtcaac ctggcggttc tctgagactg 60

tcttgcgcg cctctggctt cccattcago agtactaca tgagctgggt ccgacaggcc 120

cctggcaag gacttgaatg ggtgtccacc atcatcaaga gcggcggtca cgccctactat 180

cccgacagcg tgaaggaccgc gttcaccatc agccgggaca acagcaagaa caccctgtac 240

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ctcgagatgc gcagccgtgg agccggaggat accgcccgtgt actactgtgt tagaggcggta 300
caqqqcccca tqqattattq qqqcccaqggq accacactgtaa ccgttgtcatc a 351

```
<210> SEQ ID NO 823
<211> LENGTH: 321
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
```

<400> SEQUENCE: 823

gagattgtgc tgacacagtc tccggccaca ctgtcttta gccctggcga aagagccaca	60
ctgagctgta gagccagcca gagcatcgcc gattacctgc actggtatca gcagaagcct	120
ggacaggccc ctcggctgct gattaagtac gccagccagt ccatcagcgg catccctgcc	180
agattttctg gcagcggctc tggccaccat ttcacccctga ccatcaccag cctggAACCT	240
gaggacttcg ccgtgtacta ctgccagcag ggctacagct tccccctacac atttggcggaa	300
ggcaccaagc tggaaatcaa a	321

```
<210> SEQ ID NO 824
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequen
```

<400> SEQUENCE: 824

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
 1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Pro Phe Ser Ser Tyr
 20 25 30

Tyr Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45

Ser Thr Ile Ile Lys Ser Gly Gly Tyr Ala Tyr Tyr Pro Asp Ser Val
50 55 60

Lys Asp Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr

Leu Gln Met Ser Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys

85 90 95

Val Arg Gly Gly Gin Gly Ala Met Asp Tyr Ile Gly Glu Glu Thr Thr
100 105 110

Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu
115 120 125

Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys
120 125 130

Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser
145 150 155 160

Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser

Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser

Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn

Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His

210 215 220

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Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val
 225 230 235 240
 Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
 245 250 255
 Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu
 260 265 270
 Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
 275 280 285
 Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser
 290 295 300
 Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
 305 310 315 320
 Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile
 325 330 335
 Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
 340 345 350
 Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
 355 360 365
 Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
 370 375 380
 Gly Gln Pro Glu Asn Asn Tyr Lys Thr Pro Pro Val Leu Asp Ser
 385 390 395 400
 Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg
 405 410 415
 Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
 420 425 430
 His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 435 440 445

<210> SEQ ID NO 825
 <211> LENGTH: 214
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 825

 Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly
 1 5 10 15

 Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Gly Asp Tyr
 20 25 30

 Leu His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile
 35 40 45

 Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Ala Arg Phe Ser Gly
 50 55 60

 Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Thr Ser Leu Glu Pro
 65 70 75 80

 Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Gly Tyr Ser Phe Pro Tyr
 85 90 95

 Thr Phe Gly Gly Thr Lys Leu Glu Ile Lys Arg Thr Val Ala Ala
 100 105 110

 Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
 115 120 125

 Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
 130 135 140

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Lys Val Gln Trp Lys Val Asp Asn Ala Leu Gln Ser Gly Asn Ser Gln
 145 150 155 160

Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
 165 170 175

Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
 180 185 190

Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
 195 200 205

Phe Asn Arg Gly Glu Cys
 210

<210> SEQ ID NO 826

<211> LENGTH: 1341

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 826

gaagtgcagc tgggttgaatc tggcgaggaa ctgggttcaac ctggcggttc tctgagactg	60
tcttgtgcgc cctctggctt cccattcago agctactaca tgagctgggt ccgacaggcc	120
cctggcaaaag gacttgaatg ggtgtccacc atcatcaaga gggggcgcta cgctactat	180
cccgacacgct tgaaggaccg gttcaccatc agccccggaca acagcaagaa caccctgtac	240
ctgcagatga gcagccttag agccgaggat accggcgtgt actactgtgt tagaggcga	300
caggggcccca tggattattt gggccaggaa accacagtga ccgtgtcatc agccagcacc	360
aaggggcccca gcgtgttccc tctggccctt atcagcaaga gcacatctgg cgaaacagcc	420
gcctctggctt gcctcgtgaa ggactacttt cccgagcccc tgaccgtgtc ctggaaactct	480
ggcgctctga caagcggcgt gcacaccttt ccagccgtgc tgcagagcag cggcctgtac	540
tctctgagca gcgtcgtgac agtgcaccgc agtctctgg gcacccagac ctacatctgc	600
aacgtgaacc acaagccccag caacaccaag gtggacaaga aggtggaaacc caagagctgc	660
gacaagaccc acacctgtcc cccttgtctt gcccccgaaat tgctggggagg ccctccgtg	720
ttcctgttcc ccccaaagcc caaggacacc ctgatgatca gccggacccc cgaagtgacc	780
tgcgtgggtgg tggatgtgtc ccacgaggac cctgaagtga agttcaatgt gtacgtggac	840
ggcgtggaag tgcacaacgc caagaccaag cctagagagg aacagtacaa cagcacctac	900
cggtgtgggtt ccgtcgtgac agtgcgtgcac caggactggc tgaacggcaa agagtacaag	960
tgcaagggtgtt ccaacaaggc cctgcctgcc cccatcgaga aaaccatcg caaggccaaag	1020
ggccagcccc gcaacccccca ggtgtacaca ctgcccccaaa gcagggacga gctgaccaag	1080
aaccagggtgtt ccctgacactt tctcgtgaaa ggcttctacc cctccgatata cgccgtggaa	1140
tgggagagca acggccagcc cgagaacaaac tacaagacca cccccctgt gctggacagc	1200
gacggctcat tttctctgtt cagcaagctg accgtggaca agtccccgtt gcagcaggc	1260
aacgtgttca gctgcagcgt gatgcacgag gccctgcaca accactacac ccagaagtcc	1320
ctgagcctgaa gccctggcaa g	1341

<210> SEQ ID NO 827

<211> LENGTH: 642

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 827

```

gagattgtgc tgacacagtgc tccggccaca ctgtcttta gcccggcga aagagccaca      60
ctgagctgta gagccagcca gagcatcggtt gattacctgc actggtatca gcagaaggct     120
ggacaggcccc ctcggctgtt gattaagtac gccagccagt ccatcagccg catccctgcc     180
agattttctg gcagcggctc tggcacccat ttacccctgtt ccattaccagg cctggaaacct    240
gaggacttcg ccgtgtacta ctgcacccgtt ggatcagatc tcccttacac atttggccgaa     300
ggcaccaagc tggaaatcaa acgaaccgtt gccgctccca gcgtgttcat cttccaccc       360
agcgcacgagc agctgaagtc cggcacccgtt tctgtctgtt gcctgtgtt caacttctac     420
ccccgcgagg ccaagggttca gtggaaagggtt gacaatgccc tgcagagccg caacagccag     480
gaaaagcgttca cccggccggc cagcaaggac tccacccata gcctgagccg caccctgacc     540
ctgagcaagg cccactacgtt gaagcacaag gtgtacccgtt gcgaagtgtt ccaccaggcc     600
ctgtcttagcc cccgttccaa gagttcaac cggggccgagt gt                                642

```

<210> SEQ ID NO 828

<211> LENGTH: 117

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 828

Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Ley	Val	Gln	Ley	Gly		
1															
Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
20															
Tyr	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Ley	Glu	Trp	Val
35															
Ser	Thr	Ile	Ile	Lys	Ser	Gly	Gly	Tyr	Ala	Tyr	Tyr	Pro	Asp	Ser	Val
50															
Lys	Asp	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Ley	Tyr
65															
Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
85															
Val	Lys	Gly	Gly	Gln	Gly	Ala	Met	Asp	Tyr	Trp	Gly	Gln	Gly	Thr	Thr
100															
Val	Thr	Val	Ser	Ser											

<210> SEQ ID NO 829

<211> LENGTH: 5

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 829

Ser	Tyr	Tyr	Met	Ser
1				

<210> SEQ ID NO 830

<211> LENGTH: 17

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 830

1	5	10	15
---	---	----	----

Asp

<210> SEQ ID NO 831

<211> LENGTH: 8

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 831

1	5	10	15
---	---	----	----

<210> SEQ ID NO 832

<211> LENGTH: 107

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 832

1	5	10	15
---	---	----	----

20	25	30
----	----	----

35	40	45
----	----	----

50	55	60
----	----	----

65	70	75	80
----	----	----	----

85	90	95
----	----	----

100	105
-----	-----

<210> SEQ ID NO 833

<211> LENGTH: 11

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 833

1	5	10
---	---	----

<210> SEQ ID NO 834

<211> LENGTH: 7

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 834

1	5
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<210> SEQ ID NO 835

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<211> LENGTH: 9
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 835

```
Gln Gln Gly Tyr Ser Phe Pro Tyr Thr
1           5
```

<210> SEQ ID NO 836
<211> LENGTH: 351
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 836

```
gaagtgcagc tgggttgaatc tggcgaggaga ctgggttcagc tcggcggtac tctgagactg      60
tcttgtgcgg ccagcggctt caccctcagc agctactaca tgagctgggt ccgacaggcc      120
cctggcaaaag gacttgaatg ggtgtccacc accatcaaga gggcgccata cgcctactat      180
cccgacacgcg tgaaggaccg gttcaccatc tccagagaca acagcaagaa caccctgtac      240
ctgcagatga acagcctgag agccgaggac accggcggtgt actactgtgt gaaagggtgga      300
cagggcgcca tggactattt gggccaggaa acaacagtga ccgtgtccctc a                  351
```

<210> SEQ ID NO 837
<211> LENGTH: 321
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 837

```
gagattgtgc tgacacagtc tccccccaca ctgtctctta gccctggcga aagagccaca      60
ctgagctgtt gaggccagccca gagcatcgcc gattacctgc actggtatca gcagaaggct      120
ggacaggccc ctcggctgtt gatctactat gccagccagt ccatacgccg catccccccc      180
agatttctgtt gcagcggctc tggcacccat ttccacctgtt ccataaggcag cctggaaacct      240
gaggacttcg ccgtgtacta ctgccagcag ggctacagct tcccctacac atttggccgga      300
ggcaccaagc tggaaatcaa a                                         321
```

<210> SEQ ID NO 838
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 838

```
Glu Val Gln Leu Val Glu Ser Gly Gly Leu Val Gln Leu Gly Gly
1           5           10          15
```

```
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20          25          30
```

```
Tyr Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35          40          45
```

```
Ser Thr Ile Ile Lys Ser Gly Gly Tyr Ala Tyr Tyr Pro Asp Ser Val
50          55          60
```

```
Lys Asp Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
65          70          75          80
```

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Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Val Lys Gly Gly Gln Gly Ala Met Asp Tyr Trp Gly Gln Gly Thr Thr
 100 105 110
 Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu
 115 120 125
 Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys
 130 135 140
 Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser
 145 150 155 160
 Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser
 165 170 175
 Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser
 180 185 190
 Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn
 195 200 205
 Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His
 210 215 220
 Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val
 225 230 235 240
 Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
 245 250 255
 Pro Glu Val Thr Cys Val Val Asp Val Ser His Glu Asp Pro Glu
 260 265 270
 Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
 275 280 285
 Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser
 290 295 300
 Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
 305 310 315 320
 Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro Ile Glu Lys Thr Ile
 325 330 335
 Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
 340 345 350
 Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val Ser Leu Thr Cys Leu
 355 360 365
 Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val Glu Trp Glu Ser Asn
 370 375 380
 Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro Pro Val Leu Asp Ser
 385 390 395 400
 Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr Val Asp Lys Ser Arg
 405 410 415
 Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val Met His Glu Ala Leu
 420 425 430
 His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu Ser Pro Gly Lys
 435 440 445

<210> SEQ ID NO 839

<211> LENGTH: 214

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 839

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Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly
 1 5 10 15
 Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Gly Asp Tyr
 20 25 30
 Leu His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile
 35 40 45
 Tyr Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Ala Arg Phe Ser Gly
 50 55 60
 Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
 65 70 75 80
 Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Gly Tyr Ser Phe Pro Tyr
 85 90 95
 Thr Phe Gly Gly Thr Lys Leu Glu Ile Lys Arg Thr Val Ala Ala
 100 105 110
 Pro Ser Val Phe Ile Phe Pro Pro Ser Asp Glu Gln Leu Lys Ser Gly
 115 120 125
 Thr Ala Ser Val Val Cys Leu Leu Asn Asn Phe Tyr Pro Arg Glu Ala
 130 135 140
 Lys Val Gln Trp Lys Val Asp Asn Ala Leu Glu Ser Gly Asn Ser Gln
 145 150 155 160
 Glu Ser Val Thr Glu Gln Asp Ser Lys Asp Ser Thr Tyr Ser Leu Ser
 165 170 175
 Ser Thr Leu Thr Leu Ser Lys Ala Asp Tyr Glu Lys His Lys Val Tyr
 180 185 190
 Ala Cys Glu Val Thr His Gln Gly Leu Ser Ser Pro Val Thr Lys Ser
 195 200 205
 Phe Asn Arg Gly Glu Cys
 210

<210> SEQ ID NO 840
 <211> LENGTH: 1341
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 840

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gaagtgcagc tgggtgaaatc tggcgaggaga ctggttcagc tcggcggttc tctgagactg     60
tcttgtgcgg ccagcggtt cacatcgac agctactaca tgagctgggt ccgacaggcc     120
cctggcaaag gacttgaatg ggtgtccacc atcatcaaga gcggcggtta cgcctactat     180
cccgacagcg tgaaggaccg gttcaccatc tccagagaca acagcaagaa caccctgtac     240
ctgcagatga acagccttag agccgaggac accgcgtgt actactgtgt gaaagggttga     300
caggggcccca tggactattt gggccaggaa acaacagtga ccgtgtccctc agccagcacc     360
aaggggcccca gcgtgttccc tctggccctt agcagcaaga gcacatctgg cgaaacagcc     420
gccttggct gcctcgtaa ggactacttt cccgagcccg tgaccgtgtc ctggaaactct     480
ggcgctctga caagcgccgt gcacaccttt ccagccgtgc tgccagacccag cggccgtac     540
tctctgagca gcgtcgatgc agtgcggcgc agtctctgttgc acacccagac ctacatctgc     600
aacgtgaacc acaagccccag caacaccaag gtggacaaga aggtggaaacc caagagctgc     660
gacaagaccc acacctgtcc cccttgcctt gcccccgaaac tgctggagg cccttccgtg     720
ttccctgttcc ccccaaagcc caaggacacc ctgtatgtca gcccggacccc cgaagtgacc     780

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tgcggtgg	tggatgtgtc	ccacgaggac	cctgaagtga	agttcaattt	gtacgtggac	840
ggcggtggaa	tgccacaacgc	caagccaag	ccttagagagg	aacagtacaa	cagcacccat	900
cggtgggt	ccgtgtgt	agtgtgcac	caggactggc	tgaacggcaa	agagtacaag	960
tgcaagggtgt	ccaacaaggc	cctgcctgcc	cccatcgaga	aaaccatcag	caaggccaa	1020
ggccagcccc	gcgaacccca	ggtgtacaca	ctgccccca	gcagggacga	gctgaccaag	1080
aaccagggtgt	ccctgacactg	tctcgtaaaa	ggtttctacc	cctccgatata	cgccgtggaa	1140
tgggagagca	acggccagcc	cgagaacaac	tacaagacca	ccccccctgt	gctggacagc	1200
gacggctcat	tcttcctgt	cagcaagctg	accgtggaca	agtcccggtg	gcagcaggc	1260
aacgtgttca	gctgcagcgt	gatgcacgag	gccctgcaca	accactacac	ccagaagttc	1320
ctgagcctga	ccccctggcaa	g				1341

<210> SEQ ID NO 841

<211> LENGTH: 642

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 841

gagattgtgc	tgacacagtc	tcccggcaca	ctgtctctta	gccctggcga	aagagccaca	60
ctgagctgta	gagccagcca	gagcatcggt	gattacgtc	actggtatca	gcagaaggct	120
ggacaggccc	ctcggtgtct	gatctactat	gccagccagt	ccatcagcgg	catcccccc	180
agattttctg	gcagcggctc	tggcaccgt	ttcacccctga	ccataaggcag	cctggAACCT	240
gaggacttcg	ccgtgtacta	ctgcccagcag	ggctacagct	tcccctacac	atttggcggaa	300
ggcaccaaggc	tggaaatcaa	acgaaaccgtg	gccgctccca	gcgtgttcat	cttcccaacct	360
agcgcacgagc	agctgttttt	cgccacagcc	tctgtcggt	gcctgtgtaa	caacttctac	420
ccccggcggg	ccaagggtgca	gttggaaagggt	gacaatggcc	tgcagagcgg	caacagccag	480
gaaagcgtga	ccgagcagga	cagcaaggac	tccacctaca	gcctgagcag	caccctgacc	540
ctgagcaagg	ccgactacga	gaagcacaag	gtgtacgcct	gcgaagggtac	ccaccaggc	600
ctgtcttagcc	ccgtgtaccaa	gagttcaac	cggggcgagt	gt		642

<210> SEQ ID NO 842

<211> LENGTH: 117

<212> TYPE: PRT

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 842

Glu	Val	Gln	Leu	Val	Glu	Ser	Gly	Gly	Gly	Ley	Ley	Gln	Leu	Gly	Gly
1					5			10				15			
Ser	Ley	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Ser	Ser	Tyr
					20			25				30			
Tyr	Met	Ser	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Ley	Glu	Trp	Val
					35			40				45			
Ser	Thr	Ile	Ile	Lys	Ser	Gly	Gly	Tyr	Ala	Tyr	Tyr	Pro	Asp	Ser	Val
				50			55					60			
Lys	Asp	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Ley	Asn
				65			70				75			80	
Ley	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys
				85			90					95			

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Val Lys Gly Gly Gln Gly Ala Met Asp Tyr Trp Gly Gln Gly Thr Thr
 100 105 110

Val Thr Val Ser Ser
 115

<210> SEQ ID NO 843
 <211> LENGTH: 5
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 843

Ser Tyr Tyr Met Ser
 1 5

<210> SEQ ID NO 844
 <211> LENGTH: 17
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 844

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

Asp

<210> SEQ ID NO 845
 <211> LENGTH: 8
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 845

Gly Gly Gln Gly Ala Met Asp Tyr
 1 5

<210> SEQ ID NO 846
 <211> LENGTH: 107
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 846

Glu Ile Val Leu Thr Gln Ser Pro Ala Thr Leu Ser Leu Ser Pro Gly
 1 5 10 15

Glu Arg Ala Thr Leu Ser Cys Arg Ala Ser Gln Ser Ile Gly Asp Tyr
 20 25 30

Leu His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Arg Leu Leu Ile
 35 40 45

Lys Tyr Ala Ser Gln Ser Ile Ser Gly Ile Pro Ala Arg Phe Ser Gly
 50 55 60

Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Leu Glu Pro
 65 70 75 80

Glu Asp Phe Ala Val Tyr Tyr Cys Gln Gln Gly Tyr Ser Phe Pro Tyr
 85 90 95

Thr Phe Gly Gly Thr Lys Leu Glu Ile Lys
 100 105

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<210> SEQ ID NO 847
<211> LENGTH: 11
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 847

Arg Ala Ser Gln Ser Ile Gly Asp Tyr Leu His
1 5 10

<210> SEQ ID NO 848
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 848

Tyr Ala Ser Gln Ser Ile Ser
1 5

<210> SEQ ID NO 849
<211> LENGTH: 9
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 849

Gln Gln Gly Tyr Ser Phe Pro Tyr Thr
1 5

<210> SEQ ID NO 850
<211> LENGTH: 351
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 850

gaagtgcagc tgggtgaaatc tggcgaggatc ctgctgcagc ttggcgatc tctgagactg	60
tcttgtgcgc ccagcggtt cacattcago agtactaca tgagctgggt ccgacaggcc	120
cctggcaaag gacttgaatg ggtgtccacc atcatcaaga gggcggtcta cgcctactat	180
cccgacacgcg tgaaggaccg gttcaccatc tccagagaca acagcaagaa caccctgaac	240
ctgcagatga acagcctgag agccgaggac accgcccgtgt actactgtgt gaaaggtgga	300
cagggcgcca tggactattt gggccaggga acaacagtga ccgtgtccctc a	351

<210> SEQ ID NO 851
<211> LENGTH: 321
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 851

gagattgtgc tgacacagtgc tccccccaca ctgtcttta gccctggcgaa aagagccaca	60
ctgagctgtt gaggcagccaa gagcatcgcc gattacctgc actggtatca gcagaaggct	120
ggacaggcccc ctcggctgtt gattaagtac gccagccagt ccatcagcggtt catccctgcc	180
agatttcttgc gcaaggcgatc tggcacccat ttcaccctgtt ccataaggcag cctggaaacct	240

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gaggacttc ccgtgtacta ctgccagcg ggctacagct tccccctacac atttggcggaa
ggcaccaagc tgaaaaatcaa a 321

<210> SEQ ID NO 852
<211> LENGTH: 447
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 852

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Leu Gln Leu Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser Ser Tyr
20 25 30

Tyr Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Thr Ile Ile Lys Ser Gly Gly Tyr Ala Tyr Tyr Pro Asp Ser Val
50 55 60

Lys Asp Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Asn
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Val Lys Gly Gly Gln Gly Ala Met Asp Tyr Trp Gly Gln Gly Thr Thr
100 105 110

Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro Ser Val Phe Pro Leu
115 120 125

Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr Ala Ala Leu Gly Cys
130 135 140

Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr Val Ser Trp Asn Ser
145 150 155 160

Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro Ala Val Leu Gln Ser
165 170 175

Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr Val Pro Ser Ser Ser
180 185 190

Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn His Lys Pro Ser Asn
195 200 205

Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser Cys Asp Lys Thr His
210 215 220

Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu Gly Gly Pro Ser Val
225 230 235 240

Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu Met Ile Ser Arg Thr
245 250 255

Pro Glu Val Thr Cys Val Val Val Asp Val Ser His Glu Asp Pro Glu
260 265 270

Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu Val His Asn Ala Lys
275 280 285

Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr Tyr Arg Val Val Ser
290 295 300

Val Leu Thr Val Leu His Gln Asp Trp Leu Asn Gly Lys Glu Tyr Lys
305 310 315 320

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

Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln Val Tyr Thr Leu Pro
340 345 350

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Pro	Ser	Arg	Asp	Glu	Leu	Thr	Lys	Asn	Gln	Val	Ser	Leu	Thr	Cys	Leu
355				360								365			
Val	Lys	Gly	Phe	Tyr	Pro	Ser	Asp	Ile	Ala	Val	Glu	Trp	Glu	Ser	Asn
370					375							380			
Gly	Gln	Pro	Glu	Asn	Asn	Tyr	Lys	Thr	Thr	Pro	Pro	Val	Leu	Asp	Ser
385						390						395			400
Asp	Gly	Ser	Phe	Phe	Leu	Tyr	Ser	Lys	Leu	Thr	Val	Asp	Lys	Ser	Arg
							405			410			415		
Trp	Gln	Gln	Gly	Asn	Val	Phe	Ser	Cys	Ser	Val	Met	His	Glu	Ala	Leu
					420			425				430			
His	Asn	His	Tyr	Thr	Gln	Lys	Ser	Leu	Ser	Leu	Ser	Pro	Gly	Lys	
						435		440				445			

<210> SEQ ID NO 853
<211> LENGTH: 214
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 853

Glu	Ile	Val	Leu	Thr	Gln	Ser	Pro	Ala	Thr	Leu	Ser	Leu	Ser	Pro	Gly
1								5		10				15	
Glu	Arg	Ala	Thr	Leu	Ser	Cys	Arg	Ala	Ser	Gln	Ser	Ile	Gly	Asp	Tyr
				20					25				30		
Leu	His	Trp	Tyr	Gln	Gln	Lys	Pro	Gly	Gln	Ala	Pro	Arg	Leu	Leu	Ile
					35			40			45				
Lys	Tyr	Ala	Ser	Gln	Ser	Ile	Ser	Gly	Ile	Pro	Ala	Arg	Phe	Ser	Gly
					50			55			60				
Ser	Gly	Ser	Gly	Thr	Asp	Phe	Thr	Leu	Thr	Ile	Ser	Ser	Leu	Glu	Pro
					65			70		75			80		
Glu	Asp	Phe	Ala	Val	Tyr	Tyr	Cys	Gln	Gln	Gly	Tyr	Ser	Phe	Pro	Tyr
					85			90			95				
Thr	Phe	Gly	Gly	Thr	Lys	Leu	Glu	Ile	Lys	Arg	Thr	Val	Ala	Ala	
					100			105			110				
Pro	Ser	Val	Phe	Ile	Phe	Pro	Pro	Ser	Asp	Glu	Gln	Leu	Lys	Ser	Gly
						115		120			125				
Thr	Ala	Ser	Val	Val	Cys	Leu	Leu	Asn	Asn	Phe	Tyr	Pro	Arg	Glu	Ala
					130		135			140					
Lys	Val	Gln	Trp	Lys	Val	Asp	Asn	Ala	Leu	Gln	Ser	Gly	Asn	Ser	Gln
					145		150		155			160			
Glu	Ser	Val	Thr	Glu	Gln	Asp	Ser	Lys	Asp	Ser	Thr	Tyr	Ser	Leu	Ser
					165		170			175					
Ser	Thr	Leu	Thr	Leu	Ser	Lys	Ala	Asp	Tyr	Glu	Lys	His	Lys	Val	Tyr
					180		185			190					
Ala	Cys	Glu	Val	Thr	His	Gln	Gly	Leu	Ser	Ser	Pro	Val	Thr	Lys	Ser
					195		200			205					
Phe	Asn	Arg	Gly	Glu	Cys										
					210										

<210> SEQ ID NO 854
<211> LENGTH: 1341
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

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<400> SEQUENCE: 854

gaagtgcagc	tgggttggaaatc	tggggggagga	ctgctgcagc	ttggcggttc	tctgagactg	60
tcttgtgcgc	ccagcggctt	cacccctcago	agctactaca	tgagctgggt	ccgacaggcc	120
cctggcaaaag	gacttgaatg	ggtgtccacc	atcatcaaga	gcccggctca	cgcctactat	180
ccccacacgc	tgaaggaccg	gttaccatc	tccagagaca	acagcaagaa	caccctgaac	240
ctgcagatga	acagcctgag	agccgaggac	accggcgtgt	actactgtgt	gaaagggtgga	300
cagggcgcca	tggactattg	ggggcaggga	acaacagtga	ccgtgtcctc	agccagcacc	360
aaggggccca	cgctgttccc	tctggccctt	agcagcaaga	gcacatctgg	cggaacagcc	420
gccctgggct	gcctcgtgaa	ggactacttt	cccgagcccg	tgaccgtgtc	ctggaaactct	480
ggcgctctga	caagcggcgt	gcacaccttt	ccagccgtc	tgcagagcag	cggcctgtac	540
tctctgagca	gcgtcggtac	agtcccaga	agctctctgg	gcacccagac	ctacatctgc	600
aacgtgaacc	acaagcccag	caacaccaag	gtggacaaga	aggtggaaacc	caagagctgc	660
gacaagaccc	acacctgtcc	cccttgcct	gcccccgaa	tgctgggggg	cccttccgtg	720
ttcctgttcc	ccccaaagcc	caaggacacc	ctgatgtatc	gccggacccc	cgaagtgacc	780
tgcggtgggg	tggatgtgtc	ccacgaggac	cctgaagtga	agttcaatg	gtacgtggac	840
ggcggtggaa	tgcacaacgc	caagaccaag	cctagagagg	aacagtacaa	cagcacctac	900
cggtgtgtgt	ccgtcgctgac	agtgtcgac	caggactggc	tgaacggcaa	agagtacaag	960
tgcaagggtgt	ccaacaaggc	cctgcctgcc	cccatcgaga	aaaccatcag	caaggccaa	1020
ggccagcccc	gcgaaccccc	gggttacaca	ctgcccccaa	gcagggacga	gctgaccaag	1080
aaccagggtgt	ccctgacactg	tctcgtaaaa	ggcttctacc	cctccgatata	cgccgtggaa	1140
tgggagagca	acggccagcc	cgagaacaa	tacaagacca	ccccccctgt	gctggacagc	1200
gacggctcat	tcttcctgt	cagcaagctg	accgtggaca	agtcccggtg	gcagcaggcc	1260
aacgtgttca	gtgtcgacgt	gtatgcacg	gccctgcaca	accactacac	ccagaagtcc	1320
ctgagcctga	gccctggcaa	g				1341

<210> SEQ ID NO 855

<211> LENGTH: 642

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 855

gagattgtgc	tgacacagtc	tccgcacaca	ctgtctctta	gccctggcga	aagagccaca	60
ctgagctgta	gagccagcca	gagcatcgcc	gattacctgc	actggtatca	gcagaaggct	120
ggacaggccc	ctcggtgtct	gattaagtac	gccagccagt	ccatcagccg	catccctgcc	180
agatttctg	cgacggcgtc	tggccaccat	ttcacccctga	ccataaagcag	cctggaaacct	240
gaggacttcg	ccgtgtacta	ctgcccacag	ggctacagct	tcccctacac	atttggccga	300
ggcaccaagg	tggaaatcaa	acgaaccgtg	gccgctccca	gcgtgttcat	cttcccacct	360
agcgacgagc	agctgttttt	ccggcaccatc	tctgtcggt	gcctgtgtaa	caacttctac	420
ccccgcgagg	ccaagggtgc	gtggaaagggt	gacaatgccc	tgcagagccg	caacagccag	480
gaaaggcgtga	ccgacggat	cagcaaggac	tccacccatca	gcctgtgtac	caccctgacc	540
ctgagcaagg	ccgactacga	gaagcacaag	gtgtacccct	gcgtgtgtac	ccaccaggcc	600
ctgtctagcc	ccgtgaccaa	gagcttcaac	cggggcgagt	gt		642

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<210> SEQ ID NO 856
<211> LENGTH: 122
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 856

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Gly	Leu	Val	Gln	Pro	Gly	Gly
1					5			10					15		

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Arg Ser Tyr
20 25 30

Ala Val His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ser Ser Thr Glu Gly Ser Gly Val Gly Thr Ser Tyr Thr Asp Ser Val
50 55 60

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

Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Met Leu Gly Gly Asn Pro Leu Asp Tyr Leu Asp Tyr Trp
100 105 110

Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> SEQ ID NO 857
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 857

Ser Tyr Ala Val His
1 5

<210> SEQ ID NO 858
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 858

Ser	Thr	Glu	Gly	Ser	Gly	Val	Gly	Thr	Ser	Tyr	Thr	Asp	Ser	Val	Lys
1						5		10					15		

Gly

<210> SEQ ID NO 859
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 859

Met Leu Gly Gly Gly Asn Pro Leu Asp Tyr Leu Asp Tyr
1 5 10

<210> SEQ ID NO 860
<211> LENGTH: 111

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<212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 860

 Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15

 Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Leu Gly Glu Gly
 20 25 30

 Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Lys Ala Pro Lys Leu
 35 40 45

 Leu Ile Tyr Tyr Ser Asp Phe Arg Pro Ser Gly Val Ser Asp Arg Phe
 50 55 60

 Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu
 65 70 75 80

 Gln Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser
 85 90 95

 Leu Ser Ser Gln Val Phe Gly Gly Thr Gln Val Thr Val Leu
 100 105 110

 <210> SEQ ID NO 861
 <211> LENGTH: 14
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 861

 Ser Gly Ser Ser Ser Asn Leu Gly Glu Gly Tyr Asp Val His
 1 5 10

 <210> SEQ ID NO 862
 <211> LENGTH: 7
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 862

 Tyr Ser Asp Phe Arg Pro Ser
 1 5

 <210> SEQ ID NO 863
 <211> LENGTH: 11
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 863

 Ala Ala Trp Asp Asp Ser Leu Ser Ser Gln Val
 1 5 10

 <210> SEQ ID NO 864
 <211> LENGTH: 366
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 864

 gaagttcagc tgctgaaatc tggcgccgga ctgggttcaac ctggcgatc tctgagactg 60

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agctgtgcggccg ccagcggctt cacctttaga agctatgcgg tgcactgggt ccgacaggcc	120
cctggaaaag gactggaatg ggtgtccago accgaaggct ctggcggtgg cacaagctac	180
accgattctg tgaagggcag attcaccatc agccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accggcgtgt actactgtgc cagaatgctc	300
ggcggaggca acccctctgga ctacctggat tattggggcc agggcacccct ggtcacagtc	360
tcttca	366

<210> SEQ ID NO 865
<211> LENGTH: 333
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 865

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgtacgc gcagcagctc caatctcgcc gagggctatg acgtgcactg gtatcagcag	120
ctgcctggca aggcccctaa actgtgtatc tactacagcg acttcagacc cagcggcgtg	180
tccgatagat tcagcggctc taagagcgcc acatctgcca gcctggccat ctctggactg	240
cagagcgaag atgaggccga ctactattgc gccgcctggg atgatagcct gagcagccaa	300
gtttttggcg gcgaaaccca agtgaccgtg cta	333

<210> SEQ ID NO 866
<211> LENGTH: 452
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 866

Glu Val Gln Leu Leu Glu Ser Gly Gly Leu Val Gln Pro Gly Gly	
1 5 10 15	
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Arg Ser Tyr	
20 25 30	
Ala Val His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val	
35 40 45	
Ser Ser Thr Glu Gly Ser Gly Val Gly Thr Ser Tyr Thr Asp Ser Val	
50 55 60	
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr	
65 70 75 80	
Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys	
85 90 95	
Ala Arg Met Leu Gly Gly Asn Pro Leu Asp Tyr Leu Asp Tyr Trp	
100 105 110	
Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro	
115 120 125	
Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr	
130 135 140	
Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr	
145 150 155 160	
Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro	
165 170 175	
Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr	
180 185 190	

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Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn
195 200 205

His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser
210 215 220

Cys Asp Lys Thr His Thr Cys Pro Pro Cys Pro Ala Pro Glu Leu Leu
225 230 235 240

Gly Gly Pro Ser Val Phe Leu Phe Pro Pro Lys Pro Lys Asp Thr Leu
245 250 255

Met Ile Ser Arg Thr Pro Glu Val Thr Cys Val Val Val Asp Val Ser
260 265 270

His Glu Asp Pro Glu Val Lys Phe Asn Trp Tyr Val Asp Gly Val Glu
275 280 285

Val His Asn Ala Lys Thr Lys Pro Arg Glu Glu Gln Tyr Asn Ser Thr
290 295 300

Tyr Arg Val Val Ser Val Leu Thr Val Leu His Gln Asp Trp Leu Asn
305 310 315 320

Gly Lys Glu Tyr Lys Cys Lys Val Ser Asn Lys Ala Leu Pro Ala Pro
325 330 335

Ile Glu Lys Thr Ile Ser Lys Ala Lys Gly Gln Pro Arg Glu Pro Gln
340 345 350

Val Tyr Thr Leu Pro Pro Ser Arg Asp Glu Leu Thr Lys Asn Gln Val
355 360 365

Ser Leu Thr Cys Leu Val Lys Gly Phe Tyr Pro Ser Asp Ile Ala Val
370 375 380

Glu Trp Glu Ser Asn Gly Gln Pro Glu Asn Asn Tyr Lys Thr Thr Pro
385 390 395 400

Pro Val Leu Asp Ser Asp Gly Ser Phe Phe Leu Tyr Ser Lys Leu Thr
405 410 415

Val Asp Lys Ser Arg Trp Gln Gln Gly Asn Val Phe Ser Cys Ser Val
420 425 430

Met His Glu Ala Leu His Asn His Tyr Thr Gln Lys Ser Leu Ser Leu
435 440 445

Ser Pro Gly Lys
450

<210> SEQ ID NO 867
<211> LENGTH: 217
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 867

Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
1 5 10 15

Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Leu Gly Glu Gly
20 25 30

Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Lys Ala Pro Lys Leu
35 40 45

Leu Ile Tyr Tyr Ser Asp Phe Arg Pro Ser Gly Val Ser Asp Arg Phe
50 55 60

Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu
65 70 75 80

Gln Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser
85 90 95

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Leu Ser Ser Gln Val Phe Gly Gly Thr Gln Val Thr Val Leu Gly
 100 105 110
 Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
 115 120 125
 Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
 130 135 140
 Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
 145 150 155 160
 Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
 165 170 175
 Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
 180 185 190
 His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
 195 200 205
 Lys Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> SEQ ID NO 868
 <211> LENGTH: 1356
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

 <400> SEQUENCE: 868

gaagttcagc	tgctggaaatc	tggggcgaga	ctgggtcaac	ctggcgaggatc	tctgagactg	60
agctgtgcgc	ccagcggctt	cacctttaga	agetatgccc	tgcactgggt	ccgacaggcc	120
cctggaaaag	gactggaaatg	ggtgtccago	accgaaggct	ctggcggtgg	cacaagctac	180
accgattctg	tgaaggggcag	attcaccatc	agccgggaca	acagcaagaa	caccctgtac	240
ctgcagatga	acagcctgag	agccgaggac	acccgcgtgt	actactgtgc	cagaatgtc	300
ggccggaggca	accctctggta	ctacctggat	tattggggcc	agggcacccct	ggtcacagtc	360
tcttcagcca	gcaccaaggg	ccccagcgtg	ttccctctgg	cccctagcag	caagagcaca	420
tctggcgaa	cagccgcctt	gggtgcctc	gtgaaggact	acttcccgaa	gcccggtgacc	480
gtgtcctgga	actctggcgc	tctgacaago	ggcgtgcaca	ccttccacgc	cgtgtcgag	540
agcagcggcc	tgtactctct	gagcagcgtc	gtgacagtgc	ccagcagctc	tctgggcacc	600
cagacctaca	tctgcaacgt	gaaccacaag	cccagcaaca	ccaagggtgga	caagaagggt	660
gaacccaaga	gctgcgacaa	gacccacacc	tgtccccctt	gtcctgcctt	cgaactgtcg	720
ggaggccctt	ccgtgttcct	gttcccccca	aagcccaagg	acaccctgtat	gatcagccgg	780
accccccgaag	tgacctgcgt	gggtgtggat	gtgtcccacg	aggaccctga	agtgaagttc	840
aatttgtacg	tggacggcgt	ggaagtgcac	aacgccaaga	ccaagcctag	agaggaacag	900
tacaacagca	cctaccgggt	ggtgtccgtg	ctgacagtgc	tgcaccagga	ctggctgaac	960
ggcaaagagt	acaagtgcac	ggtgtccaa	aaggccctgc	ctgccccat	cgagaaaacc	1020
atcagcaagg	ccaagggcca	gccccgcgaa	ccccaggtgt	acacactgcc	cccaaggcagg	1080
gacgagctga	ccaagaacca	ggtgtccctg	acctgtctcg	tgaaaggctt	ctaccctcc	1140
gatatcgccg	tggaatggga	gagcaacggc	cagcccgaga	acaactacaa	gaccaccccc	1200
cctgtgtgg	acagcgacgg	ctcattcttc	ctgtacagca	agctgaccgt	ggacaagtcc	1260
cggtggcagc	agggcaacgt	gttcagctgc	agcgtgtgc	acgaggccct	gcacaaccac	1320

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tacacccaga agtccctgag cctgagccct ggcaag

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<210> SEQ_ID NO 869
<211> LENGTH: 651
<212> TYPE: DNA
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 869

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cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttagcg gcagcagctc caatctcgcc gagggctatg acgtgcactg gtatcagcag      120
ctgcctggca aggcccctaa actgctgatc tactacagcg acttcagacc cagcggcgtg      180
tccgatagat tcagcggctc taagagcgcc acatctgcca gcctggccat ctctggactg      240
cagagcgaag atgaggccga ctactattgc gccgcctggg atgatagcct gagcagccaa      300
gtttttggcg gcggAACCCCA agtgaccgtg ctaggccagc ctaaagccgc ccctagcgtg      360
ccctgttcc ctccaaagcag cgaggaaactg caggccaaca aggccacct cgtgtgcctg      420
atcagcgact tctatcctgg cgccgtgacc gtggcctggg aggccgatag ctctcctgtg      480
aaggccggcg tggaaaccac cacccctago aagcagagca acaacaata cgccgcccagc      540
agctacctga gcctgaccccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg      600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c      651
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<210> SEQ_ID NO 870
<211> LENGTH: 122
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 870

Glu	Val	Gln	Leu	Leu	Glu	Ser	Gly	Gly	Ley	Val	Gln	Pro	Gly	Gly
1														

Ser	Leu	Arg	Leu	Ser	Cys	Ala	Ala	Ser	Gly	Phe	Thr	Phe	Arg	Ser	Tyr

Ala	Val	His	Trp	Val	Arg	Gln	Ala	Pro	Gly	Lys	Gly	Ley	Glu	Trp	Val

Ser	Ser	Thr	Glu	Gly	Ser	Gly	Val	Gly	Thr	Ser	Tyr	Thr	Asp	Ser	Val

Lys	Gly	Arg	Phe	Thr	Ile	Ser	Arg	Asp	Asn	Ser	Lys	Asn	Thr	Leu	Tyr
65															

Leu	Gln	Met	Asn	Ser	Leu	Arg	Ala	Glu	Asp	Thr	Ala	Val	Tyr	Tyr	Cys

Ala	Arg	Met	Leu	Gly	Gly	Asn	Pro	Leu	Asp	Tyr	Ley	Asp	Tyr	Trp

Gly	Gln	Gly	Thr	Leu	Val	Thr	Val	Ser	Ser

<210> SEQ_ID NO 871
<211> LENGTH: 5
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence
<400> SEQUENCE: 871

Ser Tyr Ala Val His

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1 5

<210> SEQ ID NO 872
<211> LENGTH: 17
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 872

Ser	Thr	Glu	Gly	Ser	Gly	Val	Gly	Thr	Ser	Tyr	Thr	Asp	Ser	Val	Lys
1				5				10				15			

Gly

<210> SEQ ID NO 873
<211> LENGTH: 13
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 873

Met	Leu	Gly	Gly	Asn	Pro	Leu	Asp	Tyr	Leu	Asp	Tyr
1				5			10				

<210> SEQ ID NO 874
<211> LENGTH: 111
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 874

Gln	Ser	Val	Leu	Thr	Gln	Pro	Pro	Ser	Ala	Ser	Gly	Thr	Pro	Gly	Gln
1				5				10				15			

Arg	Val	Thr	Ile	Ser	Cys	Ser	Gly	Ser	Ser	Ser	Asn	Leu	Gly	Glu	Gly
20				25							30				

Tyr	Asp	Val	His	Trp	Tyr	Gln	Gln	Leu	Pro	Gly	Lys	Ala	Pro	Lys	Leu
35				40					45						

Leu	Ile	Tyr	Tyr	Ser	Asp	Phe	Arg	Pro	Ser	Gly	Val	Ser	Asp	Arg	Phe
50				55			60								

Ser	Gly	Ser	Lys	Ser	Gly	Thr	Ser	Ala	Ser	Leu	Ala	Ile	Ser	Gly	Leu
65				70				75				80			

Gln	Ser	Glu	Asp	Glu	Ala	Asp	Tyr	Tyr	Cys	Ala	Ala	Trp	Asp	Asp	Ser
85				90					95						

Leu	Ser	Ser	Gln	Val	Phe	Gly	Gly	Thr	Gln	Val	Thr	Val	Leu	
100				105				110						

<210> SEQ ID NO 875
<211> LENGTH: 14
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence
<220> FEATURE:
<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 875

Ser	Gly	Ser	Ser	Ser	Asn	Leu	Gly	Glu	Tyr	Asp	Val	His
1				5				10				

<210> SEQ ID NO 876
<211> LENGTH: 7
<212> TYPE: PRT
<213> ORGANISM: Artificial Sequence

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<220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 876

Tyr Ser Asp Phe Arg Pro Ser
 1 5

<210> SEQ ID NO 877
 <211> LENGTH: 11
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 877

Ala Ala Trp Asp Asp Ser Leu Ser Ser Gln Val
 1 5 10

<210> SEQ ID NO 878
 <211> LENGTH: 366
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 878

gaagttcagc tgctgaaatc tggcgccgga ctgggtcaac ctggcgatc tctgagactg	60
agctgtgccg ccagcggtt cacctttaga agctatgcgg tgcactgggt ccgacaggcc	120
cctggaaaag gactggatg ggtgtccago accgaaggct ctggcggtgg cacaagctac	180
accgattctg tgaagggcag attcaccato a gccgggaca acagcaagaa caccctgtac	240
ctgcagatga acagcctgag agccgaggac accgcgtgt actactgtgc cagaatgtc	300
ggcggaggca accctctgga ctacctggat tattggggcc agggcacccct ggtcacagtc	360
tcttca	366

<210> SEQ ID NO 879
 <211> LENGTH: 333
 <212> TYPE: DNA
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 879

cagtctgttc tgacacagcc tccttagcgcc tctggcacac ctggacagag agtgaccatc	60
agctgtagcg gcagcagctc caatctcgcc gagggctatg acgtgcactg gtatcagcag	120
ctgcctggca aggcccctaa actgtgtatc tactacagcg acttcagacc cagcggcgtg	180
tccgatagat tcageggctc taagagcgcc acatctgcca gcctggccat ctctggactg	240
cagagcgaag atgaggccga ctactattgc gcccctggg atgatagcct gagcagccaa	300
gtttttggcg gcgaaaccca agtgaccgtg cta	333

<210> SEQ ID NO 880
 <211> LENGTH: 251
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 880

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
 1 5 10 15

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Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Arg Ser Tyr
 20 25 30
 Ala Val His Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
 35 40 45
 Ser Ser Thr Glu Gly Ser Gly Val Gly Thr Ser Tyr Thr Asp Ser Val
 50 55 60
 Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ser Lys Asn Thr Leu Tyr
 65 70 75 80
 Leu Gln Met Asn Ser Leu Arg Ala Glu Asp Thr Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Met Leu Gly Gly Asn Pro Leu Asp Tyr Leu Asp Tyr Trp
 100 105 110
 Gly Gln Gly Thr Leu Val Thr Val Ser Ser Ala Ser Thr Lys Gly Pro
 115 120 125
 Ser Val Phe Pro Leu Ala Pro Ser Ser Lys Ser Thr Ser Gly Gly Thr
 130 135 140
 Ala Ala Leu Gly Cys Leu Val Lys Asp Tyr Phe Pro Glu Pro Val Thr
 145 150 155 160
 Val Ser Trp Asn Ser Gly Ala Leu Thr Ser Gly Val His Thr Phe Pro
 165 170 175
 Ala Val Leu Gln Ser Ser Gly Leu Tyr Ser Leu Ser Ser Val Val Thr
 180 185 190
 Val Pro Ser Ser Ser Leu Gly Thr Gln Thr Tyr Ile Cys Asn Val Asn
 195 200 205
 His Lys Pro Ser Asn Thr Lys Val Asp Lys Lys Val Glu Pro Lys Ser
 210 215 220
 Cys Ala Ala Gly Ser Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu Ser
 225 230 235 240
 Gly Ser Ala Ala Ala His His His His His His
 245 250

<210> SEQ ID NO 881
 <211> LENGTH: 217
 <212> TYPE: PRT
 <213> ORGANISM: Artificial Sequence
 <220> FEATURE:
 <223> OTHER INFORMATION: antibody sequence
 <400> SEQUENCE: 881

 Gln Ser Val Leu Thr Gln Pro Pro Ser Ala Ser Gly Thr Pro Gly Gln
 1 5 10 15

 Arg Val Thr Ile Ser Cys Ser Gly Ser Ser Ser Asn Leu Gly Glu Gly
 20 25 30

 Tyr Asp Val His Trp Tyr Gln Gln Leu Pro Gly Lys Ala Pro Lys Leu
 35 40 45

 Leu Ile Tyr Tyr Ser Asp Phe Arg Pro Ser Gly Val Ser Asp Arg Phe
 50 55 60

 Ser Gly Ser Lys Ser Gly Thr Ser Ala Ser Leu Ala Ile Ser Gly Leu
 65 70 75 80

 Gln Ser Glu Asp Glu Ala Asp Tyr Tyr Cys Ala Ala Trp Asp Asp Ser
 85 90 95

 Leu Ser Ser Gln Val Phe Gly Gly Thr Gln Val Thr Val Leu Gly
 100 105 110

 Gln Pro Lys Ala Ala Pro Ser Val Thr Leu Phe Pro Pro Ser Ser Glu
 115 120 125

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Glu Leu Gln Ala Asn Lys Ala Thr Leu Val Cys Leu Ile Ser Asp Phe
 130 135 140

Tyr Pro Gly Ala Val Thr Val Ala Trp Lys Ala Asp Ser Ser Pro Val
 145 150 155 160

Lys Ala Gly Val Glu Thr Thr Pro Ser Lys Gln Ser Asn Asn Lys
 165 170 175

Tyr Ala Ala Ser Ser Tyr Leu Ser Leu Thr Pro Glu Gln Trp Lys Ser
 180 185 190

His Arg Ser Tyr Ser Cys Gln Val Thr His Glu Gly Ser Thr Val Glu
 195 200 205

Lys Thr Val Ala Pro Thr Glu Cys Ser
 210 215

<210> SEQ ID NO 882

<211> LENGTH: 753

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 882

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gaagttcagc tgctgaaatc tggcgccgga ctggttcaac ctggcgatc tctgagactg      60
agctgtgcgc ccagcggctt cacctttaga agctatgcgg tgcactgggt ccgacaggcc     120
cctggaaaag gactggaatg ggtgtccagc accgaaggct ctggcgtggg cacaagctac     180
accgattctg tgaaggcagc attcaccatc agccgggaca acagcaagaa caccctgtac     240
ctgcagatga acagcctgag agccgaggac accgcccgtgt actactgtgc cagaatgctc   300
ggcggaggca accctctgga ctacctggat tattggggcc agggcacctt ggtcacagtc   360
tcttcagctt ccaccaaggg cccatcggtt ttccccctgg cacccttcctc caagagcacc 420
tctggggca cagcggccctt gggctgcctt gtcaaggact acttccccga accggtgacg   480
gtgtcggtt actcaggcgc cctgaccatc ggctgcaca cttcccgcc tgccttacatg   540
tcctcaggac tctactccctt cagcagcgtt gtgaccgttc cttccagcag cttgggcacc 600
cagacctaca tctgcaacgtt gaatcacaag cccagcaaca ccaagggttga caagaaagtt 660
gagcccaaattt ctgtgcagc gggttctgaa caaaaactca tctcagaaga ggatctgtct 720
ggatcagcgg ccgccccatca tcatcatcat cat                                753
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<210> SEQ ID NO 883

<211> LENGTH: 651

<212> TYPE: DNA

<213> ORGANISM: Artificial Sequence

<220> FEATURE:

<223> OTHER INFORMATION: antibody sequence

<400> SEQUENCE: 883

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cagtctgttc tgacacagcc tcctagcgcc tctggcacac ctggacagag agtgaccatc      60
agctgttagcg gcagcagctc caatctggc gagggctatg acgtgcactg gtatcagcag    120
ctgcctggca aggccctaa actgtgtatc tactacagcg acttcagacc cagcggcgtt     180
tccgatagat tcagcggctc taagagcgcc acatctgcca gcctggccat ctctggactg   240
cagagcgaatg atgaggccga ctactattgc gcccgcctgg atgatagcct gagcagccaa 300
gtttttggcg gcgaaaccca agtgcaccgtt ctaggccagc ctaaagccgc ccctagcgtt 360
accctgttcc ctccaaggcag cgaggaactg caggccaaca aggccacccct cgtgtgcctg 420
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atcagcgact tctatcctgg cgccgtgacc gtggcctgga aggccgatag ctctcctgtg	480
aaggccggcg tggaaaccac cacccttago aagcagagca acaacaata cgccgccagc	540
agctacctga gcctgacccc cgagcagtgg aagtcccaca gatcctacag ctgccaagtg	600
acccacgagg gcagcaccgt ggaaaagaca gtggccctta ccgagtgcag c	651

<210> SEQ ID NO 884

<211> LENGTH: 563

<212> TYPE: PRT

<213> ORGANISM: Oryctolagus cuniculus (Rabbit)

<400> SEQUENCE: 884

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

Lys Glu Met Leu Glu Ser Asn Asn Val Ile Thr Phe Asn Gly Leu Ala			
20	25	30	

Asn Ser Ser Ser Tyr His Thr Phe Leu Leu Asp Glu Glu Arg Ser Arg			
35	40	45	

Leu Tyr Val Gly Ala Lys Asp His Ile Phe Ser Phe Asn Leu Val Asn			
50	55	60	

Ile Lys Asp Phe Gln Lys Ile Ala Trp Pro Val Ser Tyr Thr Arg Arg			
65	70	75	80

Asp Glu Cys Lys Trp Ala Gly Lys Asp Ile Leu Arg Glu Cys Ala Asn			
85	90	95	

Phe Ile Lys Val Leu Lys Val Tyr Asn Gln Thr His Leu Tyr Ala Cys			
100	105	110	

Gly Thr Gly Ala Phe His Pro Ile Cys Thr Tyr Val Gly Ile Gly His			
115	120	125	

His Pro Glu Asp Asn Ile Phe Lys Leu Glu Asp Ser His Phe Glu Asn			
130	135	140	

Gly Arg Gly Lys Ser Pro Tyr Asp Pro Lys Leu Leu Thr Ala Ser Leu			
145	150	155	160

Leu Ile Asp Gly Glu Leu Tyr Ser Gly Thr Ala Ala Asp Phe Met Gly			
165	170	175	

Arg Asp Phe Ala Ile Phe Arg Thr Leu Gly Gln His His Pro Ile Arg			
180	185	190	

Thr Glu Gln His Asp Ser Arg Trp Leu Asn Asp Pro Arg Phe Ile Ser			
195	200	205	

Ala His Leu Ile Pro Glu Ser Asp Asn Pro Glu Asp Asp Lys Val Tyr			
210	215	220	

Phe Phe Phe Arg Glu Asn Ala Ile Asp Gly Glu His Ser Gly Lys Ala			
225	230	235	240

Thr His Ala Arg Ile Gly Gln Ile Cys Lys Asn Asp Phe Gly Gly His			
245	250	255	

Arg Ser Leu Val Asn Lys Trp Thr Thr Phe Leu Lys Ala Arg Leu Ile			
260	265	270	

Cys Ser Val Pro Gly Pro Asn Gly Ile Asp Thr His Phe Asp Glu Leu			
275	280	285	

Gln Asp Val Phe Leu Met Asn Ser Lys Asp Pro Lys Asn Pro Ile Val			
290	295	300	

Tyr Gly Val Phe Thr Thr Ser Ser Asn Ile Phe Arg Gly Ser Ala Val			
305	310	315	320

Cys Met Tyr Ser Met Ser Asp Val Arg Arg Val Phe Leu Gly Pro Tyr			
325	330	335	

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729

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-continued

Ala His Arg Asp Gly Pro Asn Tyr Gln Trp Val Pro Phe Gln Gly Arg
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 Val Pro Tyr Pro Arg Pro Gly Thr Cys Pro Ser Lys Thr Phe Gly Gly
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 Ile Met Val Lys Thr Asp Val Asn Tyr Gln Phe Thr Gln Ile Val Val
 405 410 415
 Asp Arg Val Asp Ala Glu Asp Gly Gln Tyr Asp Val Met Phe Ile Gly
 420 425 430
 Thr Asp Val Gly Thr Val Leu Lys Val Val Ser Ile Pro Lys Glu Thr
 435 440 445
 Trp His Asp Leu Glu Glu Val Leu Leu Glu Glu Met Thr Val Phe Arg
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 Glu Pro Thr Thr Ile Ser Ala Met Glu Leu Ser Thr Lys Gln Gln Gln
 465 470 475 480
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 485 490 495
 Cys Asp Ile Tyr Gly Lys Ala Cys Ala Glu Cys Cys Leu Ala Arg Asp
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 Pro Tyr Cys Ala Trp Asp Gly Ser Ser Cys Ser Arg Tyr Phe Pro Thr
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<211> LENGTH: 1689

<212> TYPE: DNA

<213> ORGANISM: Oryctolagus cuniculus (Rabbit)

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ctgctggacg aggaacggtc cagactgtac gtgggagcca aggaccacat cttcagcttc      180
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ctgaaggtgt acaatcagac ccacctgtac gcctgtggca cggcgcttt tcaccctatc      360
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caccatcat						1689

What is claimed is:

1. An isolated antibody or antigen-binding fragment thereof which binds to human Semaphorin 3A (Sema3A), wherein said isolated antibody or antigen-binding fragment thereof comprises:

a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 42, an H-CDR2 comprising SEQ ID NO: 43, and an H-CDR3 comprising SEQ ID NO: 44 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 46, an L-CDR2 comprising SEQ ID NO: 47, and an L-CDR3 comprising SEQ ID NO: 48; or

a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 62, an H-CDR2 comprising SEQ ID NO: 63, and an H-CDR3 comprising SEQ ID NO: 64 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 66, an L-CDR2 comprising SEQ ID NO: 67, and an L-CDR3 comprising SEQ ID NO: 68; or

a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 102, an H-CDR2 comprising SEQ ID NO: 103, and an H-CDR3 comprising SEQ ID NO: 104 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 106, an L-CDR2 comprising SEQ ID NO: 107, and an L-CDR3 comprising SEQ ID NO: 108; or

a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 122, an H-CDR2 comprising SEQ ID NO: 123, and an H-CDR3 comprising SEQ ID NO: 124 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 126, an L-CDR2 comprising SEQ ID NO: 127, and an L-CDR3 comprising SEQ ID NO: 128; or

a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 162, an H-CDR2 comprising SEQ ID NO: 163, and an H-CDR3 comprising SEQ ID NO: 164 and a light chain antigen-binding region that comprises an L-CDR1 comprising

SEQ ID NO: 166, an L-CDR2 comprising SEQ ID NO: 167, and an L-CDR3 comprising SEQ ID NO: 168; or a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 182, an H-CDR2 comprising SEQ ID NO: 183, and an H-CDR3 comprising SEQ ID NO: 184 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 186, an L-CDR2 comprising SEQ ID NO: 187, and an L-CDR3 comprising SEQ ID NO: 188; or a heavy chain antigen-binding region that comprises an H-CDR1 comprising SEQ ID NO: 342, an H-CDR2 comprising SEQ ID NO: 343, and an H-CDR3 comprising SEQ ID NO: 344 and a light chain antigen-binding region that comprises an L-CDR1 comprising SEQ ID NO: 346, an L-CDR2 comprising SEQ ID NO: 347, and an L-CDR3 comprising SEQ ID NO: 348.

2. The isolated antibody or antigen-binding fragment according to claim 1, comprising:

a variable heavy chain domain that is at least 98% identical to SEQ ID NO: 41 and a variable light chain domain that is at least 98%, identical to SEQ ID NO: 45; or

a variable heavy chain domain that is at least 98% identical to SEQ ID NO: 61 and a variable light chain domain that is at least 98%, identical to SEQ ID NO: 65; or

a variable heavy chain domain that is at least 98% identical to SEQ ID NO: 101 and a variable light chain domain that is at least 98%, identical to SEQ ID NO: 105; or

a variable heavy chain domain that is at least 98% identical to SEQ ID NO: 121 and a variable light chain domain that is at least 98%, identical to SEQ ID NO: 125; or

a variable heavy chain domain that is at least 98% identical to SEQ ID NO: 161 and a variable light chain domain that is at least 98%, identical to SEQ ID NO: 165;

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- a variable heavy chain domain that is at least 98% identical to SEQ ID NO: 181 and a variable light chain domain that is at least 98%, identical to SEQ ID NO: 185; or
 a variable heavy chain domain that is at least 98% identical to SEQ ID NO: 341 and a variable light chain domain that is at least 98%, identical to SEQ ID NO: 345.
- 3.** The isolated antibody or antigen-binding fragment according to claim 1, comprising:
 a variable heavy chain domain comprising SEQ ID NO: 41 and a variable light chain domain comprising SEQ ID NO: 45; or
 a variable heavy chain domain comprising SEQ ID NO: 61 and a variable light chain domain comprising SEQ ID NO: 65; or
 a variable heavy chain domain comprising SEQ ID NO: 101 and a variable light chain domain comprising SEQ ID NO: 105; or
 a variable heavy chain domain comprising SEQ ID NO: 121 and a variable light chain domain comprising SEQ ID NO: 125; or
 a variable heavy chain domain comprising SEQ ID NO: 161 and a variable light chain domain comprising SEQ ID NO: 165; or
 a variable heavy chain domain comprising SEQ ID NO: 181 and a variable light chain domain comprising SEQ ID NO: 185; or
 a variable heavy chain domain comprising SEQ ID NO: 341 and a variable light chain domain comprising SEQ ID NO: 345.
- 4.** The isolated antibody according to claim 1, wherein said isolated antibody is an IgG1 or an IgG4 antibody.
- 5.** The isolated antibody according to claim 1, comprising:

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- a heavy chain comprising SEQ ID NO: 57 and a light chain comprising SEQ ID NO: 58; or
 a heavy chain comprising SEQ ID NO: 77 and a light chain comprising SEQ ID NO: 78; or
 a heavy chain comprising SEQ ID NO: 117 and a light chain comprising SEQ ID NO: 118; or
 a heavy chain comprising SEQ ID NO: 137 and a light chain comprising SEQ ID NO: 138; or
 a heavy chain comprising SEQ ID NO: 177 and a light chain comprising SEQ ID NO: 178; or
 a heavy chain comprising SEQ ID NO: 197 and a light chain comprising SEQ ID NO: 198; or
 a heavy chain comprising SEQ ID NO: 357 and a light chain comprising SEQ ID NO: 358.
- 6.** The antigen-binding fragment according to claim 1, which is an scFv, Fab, Fab' fragment or a F(ab')2 fragment.
- 7.** The isolated antibody or antigen-binding fragment according to claim 1, which is a monoclonal antibody or antigen-binding fragment thereof.
- 8.** The isolated antibody or antigen-binding fragment according to claim 1, which is a human, humanized, or chimeric antibody or antigen-binding fragment thereof.
- 9.** An antibody conjugate, comprising the isolated antibody or antigen binding fragment according to claim 1.
- 10.** A pharmaceutical composition comprising the isolated antibody or antigen-binding fragment according to claim 1 or an antibody conjugate comprising the isolated antibody or antigen binding fragment according to claim 1.
- 11.** A kit comprising the isolated antibody or antigen-binding fragment according to claim 1 or an antibody conjugate comprising the isolated antibody or antigen binding fragment according to claim 1 or a pharmaceutical composition comprising the isolated antibody or antigen-binding fragment of claim 1; and instructions for use.

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