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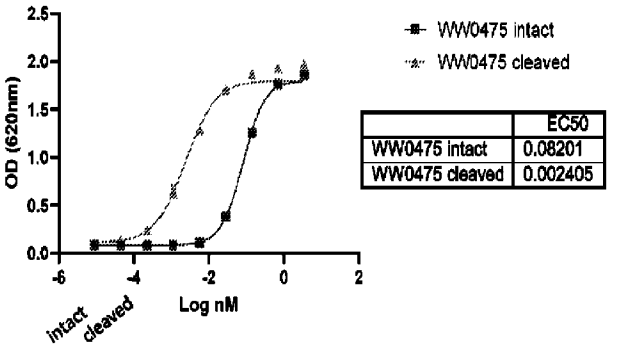
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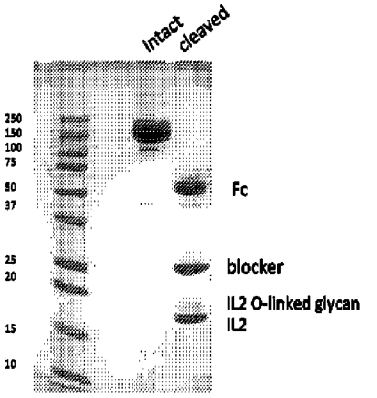
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(54) Titre : POLYPEPTIDES DE CYTOKINE ACTIVABLES ET LEURS METHODES D'UTILISATION
(54) Title: ACTIVATABLE CYTOKINE POLYPEPTIDES AND METHODS OF USE THEREOF

FIG. 1A



	EC50
WW0475 intact	0.08201
WW0475 cleaved	0.002405



(57) Abrégé/Abstract:
The disclosure features fusion proteins that are conditionally active variants of a cytokine of interest. In one aspect, the full-length polypeptides of the invention have reduced or minimal cytokine-receptor activating activity even though they contain a functional cytokine polypeptide. Upon activation, e.g., by cleavage of a linker that joins a blocking moiety, e.g. a steric blocking polypeptide, in sequence to the active cytokine, the cytokine can bind its receptor and effect signaling. Typically, the fusion proteins further comprise an in vivo half-life extension element, which may be cleaved from the cytokine in the tumor microenvironment.

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Abstract:

The disclosure features fusion proteins that are conditionally active variants of a cytokine of interest. In one aspect, the full-length polypeptides of the invention have reduced or minimal cytokine-receptor activating activity even though they contain a functional cytokine polypeptide. Upon activation, e.g., by cleavage of a linker that joins a blocking moiety, e.g. a steric blocking polypeptide, in sequence to the active cytokine, the cytokine can bind its receptor and effect signaling. Typically, the fusion proteins further comprise an in vivo half-life extension element, which may be cleaved from the cytokine in the tumor microenvironment.

ACTIVATABLE CYTOKINE POLYPEPTIDES AND METHODS OF USE THEREOF

[1] This present application claims the benefit of U.S. Provisional Application No. 62/935,605 filed on November 14, 2019, the entire teachings of which are incorporated herein by reference.

SEQUENCE LISTING

[2] The instant application contains a Sequence Listing which has been submitted electronically in ASCII format and is hereby incorporated by reference in its entirety. Said ASCII copy, created on November 12, 2020, is named 761146_000146_SL.txt and is 2,974,211 bytes in size.

BACKGROUND

[3] The development of mature immunocompetent lymphoid cells from less-committed precursors, their subsequent antigen-driven immune responses, and the suppression of these and unwanted autoreactive responses are highly dependent and regulated by cytokines (including interleukin-2 [IL-2], IL-4, IL-7, IL-9, IL-15, and IL-21) that utilize receptors in the common γ-chain (γc) family (Rochman et al., 2009) and family members including IL-12, 18 and 23. IL-2 is essential for thymic development of Treg cells and critically regulates several key aspects of mature peripheral Treg and antigen-activated conventional T cells. Because of its potent T cell growth factor activity in vitro, IL-2 has been extensively studied in part because this activity offered a potential means to directly boost immunity, e.g., in cancer and AIDS-HIV patients, or a target to antagonize unwanted responses, e.g., transplantation rejection and autoimmune diseases. Although *in vitro* studies with IL-2 provided a strong rationale for these studies, the function of IL-2 in vivo is clearly much more complex as first illustrated in IL-2-deficient mice, where a rapid lethal autoimmune syndrome, not lack of immunity, was observed (Sadlack et al., 1993, 1995). Similar observations were later made when the gene encoding IL-2Rα (Il2ra) and IL-2Rβ (Il2rb) were individually ablated (Suzuki et al., 1995; Willerford et al., 1995).

[4] The present invention refers to conditionally active and/or targeted cytokines for use in the treatment of cancer and other diseases dependent on immune up or down regulation. For example, the antitumoral activity of some cytokines is well known and described and some cytokines have already been used therapeutically in humans. Cytokines such as interleukin-2 (IL-2) and interferon α (IFNα) have shown positive antitumoral activity in patients with different types of tumors, such as kidney metastatic carcinoma, hairy cell leukemia, Kaposi sarcoma, melanoma, multiple myeloma, and the like. Other cytokines like IFNβ, the Tumor Necrosis Factor (TNF) α, TNFβ, IL-1, 4, 6, 12, 15 and the CSFs have shown a certain antitumoral activity on some types of tumors and therefore are the object of further studies.

SUMMARY

[5] Provided herein are therapeutic proteins, nucleic acids (e.g., DNA, RNA, mRNA) that encode the proteins, and compositions and methods of using the proteins and nucleic acids for the treatment of a disease or disorder, such as proliferative disease, a tumorous disease, an inflammatory disease, an immunological disorder, an autoimmune disease, an infectious disease, a viral disease, an allergic reaction, a parasitic reaction, graft-versus-host disease and the like. In certain embodiments, the fusion protein the amino acid sequence of any one of SEQ ID NOs.: 193-271. Certain fusion proteins disclosed herein are referred to as ACP200-208, ACP211, ACP213-ACP215, ACP240-ACP245, ACP247, ACP284-ACP292, ACP296-ACP300, ACP302-ACP306, ACP309-ACP314, ACP336-ACP359, ACP371-ACP379, ACP383-ACP434, ACP439-ACP447, or ACP451-ACP471. This disclosure also relates to nucleic acids (e.g., DNA, RNA, mRNA) that encode the fusion proteins, methods of making fusion proteins, compositions comprising a fusion protein, as well as methods of using the fusion proteins to treat cancer including combination of two or more fusion proteins and one or more fusion protein in combination with another therapeutic agent.

[6] The invention features fusion proteins that are conditionally active variants of a cytokine of interest. Cytokines of particular interest include IL-2, IL-12, and IFN. In one aspect, the full-length polypeptides of the invention have reduced or minimal cytokine-receptor activating activity even though they contain a functional cytokine polypeptide. Upon activation, e.g., by cleavage of a linker that joins a blocking moiety, e.g. a steric blocking polypeptide, in sequence to the active cytokine, the cytokine, e.g., IL-2, IL-7, IL-12, IL-15, IL-18, IL-21, IL-23, IFNalpha, IFNbeta, IFNgamma, TNFalpha, lymphotoxin, TGF-beta1, TGFbeta2, TGFbeta3, GM-CSF, CXCL10, CCL19, CCL20, CCL21 or functional fragment or mutein or functional variant or a subunit of any of the foregoing, can bind its receptor and effect signaling. If desired, the full-length polypeptides can include a blocking polypeptide moiety that also provides additional advantageous properties. For example, the full-length polypeptide can contain a blocking polypeptide moiety that also extends the serum half-life and/or targets the full-length polypeptide to a desired site of cytokine activity. Alternatively, the full-length fusion polypeptides can contain a serum half-life extension element and/or targeting domain that are distinct from the blocking polypeptide moiety. Preferably, the fusion protein contains at least one element or domain capable of extending *in vivo* circulating half-life. Preferably, this element is removed enzymatically in the desired body location (e.g. protease cleavage in the tumor microenvironment), restoring pharmacokinetic properties to the payload molecule (e.g. IL2, IL-12, IFNb or IFNa) substantially similar to the naturally occurring payload molecule. The fusion proteins may be targeted to a desired cell or tissue.

[7] The fusion polypeptides typically comprise a cytokine polypeptide [A], a blocking moiety [D], optionally a half-life extension moiety [H], and a protease-cleavable polypeptide linker. The cytokine polypeptide and the blocking moiety and the optional half-life extension element when

present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, e.g., the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker. Some preferred fusion polypeptides are of one of formula (I) – (VI):

[A]-[L1]-[H]-[L2]-[D] (I);

[D]-[L2]-[H]-[L1]-[A] (II);

[A]-[L1]-[D]-[L2]-[H] (III);

[H]-[L2]-[D]-[L1]-[A] (IV);

[H]-[L1]-[A]-[L2']-[D] (V);

[D]-[L1]-[A]-[L2']-[H] (VI);

wherein A is a cytokine polypeptide, D is a blocking moiety, H is a half-life extension moiety, L1 is a protease-cleavable polypeptide linker, L2 is an polypeptide linker that is optionally protease-cleavable, and L2' is a protease-cleavable polypeptide linker. L1 and L2 or L1 and L2' can be have the same or different amino acid sequence and or protease-cleavage site (when L2 is protease-cleavable) as desired.

[8] In some aspects, the fusion proteins described herein are conditionally active variants of IL-12, IL-2, or IFN. In embodiments, the fusion protein can contain an IL-2 polypeptide. The fusion protein containing an IL-2 polypeptide can comprise or consist of the amino acid sequence of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, and 636-646. The fusion proteins disclosed as SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646 are referred to herein as ACP289-ACP292, ACP296-ACP302, WW0301, ACP304-ACP306, ACP309-ACP313, WW0353, ACP414, ACP336-ACP398, WW0472-WW0477, ACP406-ACP426, ACP439-ACP447, ACP451-ACP471, WW0729, WW0734-WW0792, ACP101, ACP293-ACP295, ACP316-ACP335, ACP427-ACP438, and ACP448-ACP450. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 272. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 286. The fusion protein can comprise the amino acid sequence of SEQ ID NO:362. The fusion protein can comprise the amino acid sequence of SEQ ID NO:336. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 348. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 363. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 580.

[9] In embodiments, the fusion protein can contain IL-12. The fusion protein containing an IL-12 polypeptide can comprise or consist of the amino acid sequence of any one of SEQ ID NOs. 368-371, 434-440, 453-519, or 523-538. The fusion proteins disclosed as SEQ ID NOs. 368-371, 434-440, 453-519, or 523-538 are referred to herein as ACP240-ACP245, ACP247, ACP285-ACP288, WW0641, WW0649-WW0652, WW0662-WW0725, WW0765-WW0772, and WW0796-WW0803. For

example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 424. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 428. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 541. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 556. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 560. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 568. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 573.

[10] In embodiments, the fusion protein contains IFN. The fusion protein containing an IFN polypeptide can comprise or consist of the amino acid sequence of any one of SEQ ID NOs. 421-430, and 539-578. The fusion proteins disclosed as SEQ ID NOs. 421-430, and 539-578 can be referred to herein as ACP200-ACP209, WW0644-WW0648, WW0781-WW0786, WW0815-WW0822, WW0831-WW0834, WW0737-WW0748, and WW0787-WW0790.

[11] In some aspects, the fusion polypeptide disclosed herein can be covalently or non-covalently bonded to a second polypeptide chain. For example, a fusion polypeptide can dimerize (i.e. form a dimer) or a portion of a fusion polypeptide may associate with another polypeptide, for example, to form a functional binding site for a cytokine polypeptide or serum albumin. In certain embodiments, the second polypeptide chain and the blocking moiety on the fusion polypeptide are complementary and together form a functional binding site that has specificity for the cytokine polypeptide contained in the fusion polypeptide. Exemplary functional binding sites that can be formed by the blocking moiety of the fusion polypeptide and a complimentary second polypeptide include antigen binding sites of antibodies, such as a Fab fragment of an antibody or a portion thereof. For example, one chain of a Fab that binds the cytokine can be the blocking moiety of the fusion polypeptide, e.g., a VH-CH1, and the complementary VL-CL can be part of the second polypeptide. In such situations, the blocking moiety of the fusion protein i.e., VH-CH1 and the second polypeptide that comprises the complementary VL-CL, can associate to form a functional binding site with specificity for the cytokine polypeptide contained within the fusion protein (e.g., IL-2, IL-12, IFNalpha, IFNbeta) and attenuate cytokine polypeptide activity.

[12] In embodiments, the fusion protein containing an IL-2 cytokine polypeptide can be bonded covalently or noncovalently to a second polypeptide chain. The second polypeptide chain can contain an antibody light chain VL-CL that comprises or consists of the amino acid sequence of SEQ ID NO: 263, 264, or 333. Such a second polypeptide can bond with a complimentary VH-CH1 polypeptide contained within the fusion protein, e.g., as contained within SEQ ID NOS: 362, 363, 325, 286, 579, 581, or 582. The second polypeptide chain disclosed as SEQ ID NOs. 263, 264, and 333 can be referred herein as WW0523 (ACP381), WW0524 (ACP382), or WW0556 (ACP414).

[13] In embodiments, the fusion polypeptide can comprise or consist of the amino acid sequence of SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 and the second polypeptide chain can comprise

or consist of the amino acid sequence of SEQ ID NOs: 263, 264, or 333. The fusion polypeptide disclosed as SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 can be referred to as WW0520 (ACP378), WW0521 (ACP379), WW0548 (ACP406), WW0621 (ACP457), WW0729, WW0735, or WW0736, and the second polypeptide chain disclosed as SEQ ID NOs. 263, 264, and 333 can be referred herein as WW0523 (ACP381), WW0524 (ACP382), or WW0556 (ACP414). For example, the fusion protein can comprise or consist the amino acid sequence of SEQ ID NO: 362 and the second polypeptide chain can comprise or consist the amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist the amino acid sequence of SEQ ID NO: 362 and the second polypeptide chain can comprise or consist the amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist the amino acid sequence of SEQ ID NO: 362 and the second polypeptide chain can comprise or consist the amino acid sequence of SEQ ID NO: 333. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 363 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID No. 363 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 363 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 333. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 325 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 325 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 333. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 325 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 286 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 286 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 286, and the second polypeptide can comprise or consist of an amino acid sequence of SEW ID NO: 333. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 579 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 579 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 579 and the second polypeptide chain can comprise or consist of an amino acid

sequence of SEQ ID NO: 233. For example, the fusion protein can comprise or consist of SEQ ID NO: 581 and the second polypeptide chain can comprise or consist of SEQ ID NO.: 263. For example, the fusion protein can comprise or consist of SEQ ID NO: 581 and the second polypeptide chain can comprise or consist of SEQ ID NO.: 264. For example, the fusion protein can comprise or consist of SEQ ID NO: 581 and the second polypeptide chain can comprise or consist of SEQ ID NO.: 333. For example, the fusion protein can comprise or consist of SEQ ID NO: 582 and the second polypeptide chain can comprise or consist of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of SEQ ID NO: 582 and the second polypeptide chain can comprise or consist of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of SEQ ID NO: 582 and the second polypeptide chain can comprise or consist of SEQ ID NO: 333.

[14] As described herein targeting is accomplished through the action of a blocking polypeptide moiety that also binds to a desired target, or through a targeting domain. The domain that recognizes a target antigen on a preferred target (for example a tumor-specific antigen), may be attached to the cytokine via a cleavable or non-cleavable linker. If attached by a non-cleavable linker, the targeting domain may further aid in retaining the cytokine in the tumor, and it may be considered a retention domain. The targeting domain does not necessarily need to be directly linked to the payload molecule, and it may be linked directly to another element of the fusion protein. This is especially true if the targeting domain is attached via a cleavable linker.

[15] In one aspect is provided a fusion polypeptide comprising a cytokine polypeptide, or functional fragment, a mutein thereof, a functional variant thereof or a subunit thereof, and a blocking moiety, e.g. a steric blocking domain. The blocking moiety is fused to the cytokine polypeptide, directly or through a linker, and can be separated from the cytokine polypeptide by cleavage (e.g., protease mediated cleavage) of the fusion polypeptide at or near the fusion site or linker or in the blocking moiety. For example, when the cytokine polypeptide is fused to a blocking moiety through a linker that contains a protease cleavage site, the cytokine polypeptide is released from the blocking moiety and can bind its receptor, upon protease mediated cleavage of the linker. The linker is designed to be cleaved at the site of desired cytokine activity, for example in the tumor microenvironment, avoiding off-target cytokine activity and reducing overall toxicity of cytokine therapy.

[16] The blocking moiety can also function as a serum half-life extension element. In some embodiments, the fusion polypeptide further comprises a separate serum half-life extension element. In some embodiments, the fusion polypeptide further comprises a targeting domain. In various embodiments, the serum half-life extension element is a water-soluble polypeptide such as optionally branched or multi- armed polyethylene glycol (PEG), full length human serum albumin (HSA) or a fragment that preserves binding to FcRn, an Fc fragment, or a nanobody that binds to FcRn directly or to human serum albumin.

[17] In addition to serum half-life extension elements, the pharmaceutical compositions described herein preferably comprise at least one, or more targeting domains that bind to one or more target antigens or one or more regions on a single target antigen. It is contemplated herein that a polypeptide construct of the invention is cleaved, for example, in a disease-specific microenvironment or in the blood of a subject at the protease cleavage site and that the targeting domain(s) will bind to a target antigen on a target cell. At least one target antigen is involved in and/or associated with a disease, disorder or condition. Exemplary target antigens include those associated with a proliferative disease, a tumorous disease, an inflammatory disease, an immunological disorder, an autoimmune disease, an infectious disease, a viral disease, an allergic reaction, a parasitic reaction, a graft-versus-host disease or a host-versus-graft disease.

[18] In some embodiments, a target antigen is a cell surface molecule such as a protein, lipid or polysaccharide. In some embodiments, a target antigen is a on a tumor cell, virally infected cell, bacterially infected cell, damaged red blood cell, arterial plaque cell, or fibrotic tissue cell.

[19] Target antigens, in some cases, are expressed on the surface of a diseased cell or tissue, for example a tumor or a cancer cell. Target antigens for tumors include but are not limited to Fibroblast activation protein alpha (FAPa), Trophoblast glycoprotein (5T4), Tumor-associated calcium signal transducer 2 (Trop2), Fibronectin EDB (EDB-FN), fibronectin EIIIB domain, CGS-2, EpCAM, EGFR, HER-2, HER-3, c-Met, FOLR1, FAP, and CEA. Pharmaceutical compositions disclosed herein, also include proteins comprising two antigen binding domains that bind to two different target antigens known to be expressed on a diseased cell or tissue. Exemplary pairs of antigen binding domains include but are not limited to EGFR/CEA, EpCAM/CEA, and HER-2/HER-3.

[20] In some embodiments, the targeting polypeptides independently comprise a scFv, a VH domain, a VL domain, a non-Ig domain, or a ligand that specifically binds to the target antigen. In some embodiments, the targeting polypeptides specifically bind to a cell surface molecule. In some embodiments, the targeting polypeptides specifically bind to a tumor antigen. In some embodiments, the targeting polypeptides specifically and independently bind to a tumor antigen selected from at least one of EpCAM, EGFR, HER-2, HER-3, cMet, CEA, and FOLR1. In some embodiments, the targeting polypeptides specifically and independently bind to two different antigens, wherein at least one of the antigens is a tumor antigen selected from EpCAM, EGFR, HER-2, HER-3, cMet, CEA, and FOLR1. In some embodiments, the targeting polypeptide serves as a retention domain and is attached to the cytokine via a non-cleavable linker.

[21] As described herein, the cytokine blocking moiety can bind to the cytokine and thereby block activation of the cognate receptor of the cytokine.

[22] This disclosure also related to nucleic acids, e.g., DNA, RNA, mRNA, that encode the conditionally active proteins described herein, as well as vectors and host cells that contain such nucleic acids.

[23] This disclosure also relates to pharmaceutical compositions that contain a conditionally active protein, nucleic acid that encodes the conditionally active protein, and vectors and host cells that contain such nucleic acids. Typically, the pharmaceutical composition contains one or more physiologically acceptable carriers and/or excipients.

[24] The disclosure also relates to therapeutic methods that include administering to a subject in need thereof an effective amount of a conditionally active protein, nucleic acid that encodes the conditionally active protein, vector or host cells that contain such a nucleic acid, and pharmaceutical compositions of any of the foregoing. Typically, the subject has, or is at risk of developing, a proliferative disease, a tumorous disease, an inflammatory disease, an immunological disorder, an autoimmune disease, an infectious disease, a viral disease, an allergic reaction, a parasitic reaction, a graft-versus-host disease or a host-versus-graft disease.

[25] The disclosure also relates to the use of a conditionally active protein, nucleic acid that encodes the conditionally active protein, vector or host cells that contain such a nucleic acid, and pharmaceutical compositions of any of the foregoing, for treating a subject in need thereof. Typically, the subject has, or is at risk of developing, a proliferative disease, a tumorous disease, an inflammatory disease, an immunological disorder, an autoimmune disease, an infectious disease, a viral disease, an allergic reaction, a parasitic reaction, a graft-versus-host disease or a host-versus-graft disease.

[26] The disclosure also relates to the use of a conditionally active protein, nucleic acid that encodes the conditionally active protein, vector or host cells that contain such a nucleic acid for the manufacture of a medicament for treating a disease, such as a proliferative disease, a tumorous disease, an inflammatory disease, an immunological disorder, an autoimmune disease, an infectious disease, a viral disease, an allergic reaction, a parasitic reaction, a graft-versus-host disease or a host-versus-graft disease.

BRIEF DESCRIPTION OF THE DRAWINGS

[27] **FIGs. 1A-1E** are a series of graphs showing activity of IL-2 fusion proteins in a HEKBlue IL-2 reporter assay in the presence of HSA. Squares depict activity of the uncut IL-2 polypeptide (intact) and triangles depict the activity of the cut polypeptide (cleaved). Circles depict activity of control IL-2. EC50 for each IL-12. EC50 values for each are shown in the table. FIGs. 1A-1E also depict results of the protein cleavage assay for each IL-2 polypeptide. Constructs tested and depicted include WW0475 (FIG. 1A), WW0517 (FIG. 1B), WW0548/556 (FIG. 1C), WW0735/523 (FIG. 1D), and WW0621/523 (FIG. 1E). **FIG. 1F** is a graph showing activity of a non-cleavable control, WW0729/523. FIG. 1F also depicts results of a protein cleavage assay for the non-cleavable control.

[28] **FIGs. 2A-2L** are a series of graphs showing activity of fusion proteins in an IL-2 luciferase reporter assay. Closed squares depict activity of the uncut IL-2 polypeptide (intact) and open squares depict the activity of the cut IL-2 polypeptide (cleaved). Circles depict activity of the control (human

IL-2). EC50 values for each are shown in the table (human IL-2). EC50 values for each are shown in the table. Constructs tested and depicted include WW0521/WW0556 (FIG. 2A), WW0521/WW0524 (FIG. 2B), WW0521/WW0523 (FIG. 2C), WW0520/WW0524 (FIG. 2D), WW0517 (FIG. 2E), WW0516 (FIG. 2F), WW0417 (FIG. 2G), WW0317 (FIG. 2H), WW0317 (FIG. 2I), and WW0520/WW0523 (FIG. 2J), WW0621/WW0523 (FIG. 2K), WW0048 (FIG. 2L).

[29] **FIGs. 3A-3J** are a series of graphs showing activity of fusion proteins in an IL-2 T-Blast assay. Squares depict activity of the uncut IL-2 polypeptide (intact) and triangles depict the activity of the cut polypeptide (cleaved). Circles depict activity of the control human IL-2. EC50 values for each are shown in the table. Constructs tests and depicted include WW0317 (FIG. 3A), WW0516 (FIG. 3B), WW0354 (FIG. 3C), WW0517 (FIG. 3D), WW0621/0523 (FIG. 3E), WW0521/524 (FIG. 3F), WW0520/0523 (FIG. 3G), WW0729/523 (FIG. 3H), and WW0735/523 (FIG. 31), WW0520/524 (FIG. 3J).

[30] **FIGs. 4A-4G** are graphs that show results of analyzing WW0475, WW0520/0523, WW0548/0524, WW0548/0556, WW0517, WW0621/0523, and WW0619 IL-2 fusion proteins in a syngeneic MC38 mouse tumor model. Each graph shows average tumor volume (Mean+/- SEM) over time in mice treated with different doses of each of the fusion proteins as indicated. The data show tumor volume decreasing over time in a dose-dependent manner.

[31] **FIGs. 5A-5C** are a series of spider plots showing activity of fusion proteins in the MC38 mouse syngeneic model corresponding to the data shown in FIG. 4A-4G. Each line in the plots is the tumor volume over time for a single mouse. FIG. 5A contains the data corresponding to vehicle treatment and fusion proteins WW0517 and WW0520/523. FIG. 5B contains the data corresponding to treatment with fusion proteins WW0548/0524, WW0548/0556, and WW0475. FIG. 5C contains the data corresponding to treatment with fusion proteins WW0619 and WW0621/0523.

[32] **FIGs. 6A-6C** are a series of spider plots showing the impact of fusion proteins on body weight in an MC38 mouse syngeneic model corresponding to the data shown in FIGs. 5A-5C. Each line in the plots is the body weight over time for a single mouse. FIG. 6A contains the data corresponding to vehicle treatment and fusion proteins WW0517 and WW0520/523. FIG. 6B contains the data corresponding to treatment with fusion proteins WW0548/0524, WW0548/0556, and WW0475. FIG. 6C contains the data corresponding to treatment with fusion proteins WW0619 and WW0621/0523.

[33] **FIGs. 7A-7Q** are a series of graphs showing activity of fusion proteins in an HEKBlue IL-12 reporter assay. FIGs. 7A-7Q depict IL-12/STAT4 activation in a comparison of human p40/murine p35 IL-12 or human IL-12 fusion proteins to chimeric IL-12 (mouse p35/human p40) or recombinant human IL-12 (control). Squares depict activity of the uncut IL-12 polypeptide (intact) and triangles depict the activity of the cut IL-12 polypeptide (cleaved). Circles depict activity of the control. EC50 values for each are shown in the table.

[34] **FIGs. 8A-8D** are a series of graphs showing activity of fusion proteins in an IL12 T-Blast assay. FIGs. 8A-8D depicts activation of IL-12 signaling in a comparison of a human p40/murine p35 IL12 or human IL12 fusion protein to control, chimeric IL-12 (human p40/murine p35 IL12) or recombinant human IL12. Squares depict activity of the uncut IL-12 polypeptide (intact) and triangles depict the activity of the cut IL-12 polypeptide (cleaved). Circles depict activity of the control chimeric IL-12 or recombinant human IL-12. EC50 values for each are shown in the table.

[35] **FIGs. 9A-9C** are a series of graphs showing activity of fusion proteins in an IL-12 luciferase reporter assay. FIGs. 9A-9B depict activation of IL-12 signaling in a comparison of a human p40/murine p35 IL-12 fusion protein to recombinant human IL-12 (control). FIG. 9C depicts activation of IL-12 signaling in comparison of a human IL-12 (human p40/human p35 IL-12) fusion protein to recombinant human IL12. Closed squares depict activity of the uncut IL-12 polypeptide (intact) and open squares depict the activity of the cut polypeptide (cleaved). Circles depict activity of the control. EC50 values for each are shown in the table.

[36] **FIGs. 10A-10J** are a series of graphs showing activity of fusion proteins in the B16-Blue IFN-α/β reporter assay. FIGs. 10A-10J depict activation of the IFN-α/β pathway in a comparison of mouse INFα fusion protein to mouse INFα (control). Squares depict activity of the uncut INFα polypeptide (intact) and triangles depict the activity of the cut INFα polypeptide (cleaved). Circles depict activity of the control (mouse IFNα). EC50 values for each are shown in the table. FIGs. 10A-10J also depict results of the protein cleavage assay for each INFα fusion protein. Each INFα fusion protein was run on an SDS-PAGE gel in both cleaved and uncleaved form. As can be seen in the gel, cleavage was complete.

[37] **FIGs. 11A-11B** are graphs depicting results from a HEK-Blue IL-12 reporter assay performed on human p40/murine p35 IL12 fusion proteins before and after protease cleavage. Constructs ACP35 (FIG. 11A) and ACP34 (FIG. 11B) were tested. Analysis was performed based on quantification of Secreted Alkaline Phosphatase (SEAP) activity using the reagent QUANTI-Blue® (InvivoGen). Results confirm that IL12 protein fusion proteins are active.

[38] **FIGs. 12A-12F** show a series of graphs depicting the results of HEK-blue assay of four IL-12 fusion proteins, before and after cleavage by MMP9. Analysis was performed based on quantification of Secreted Alkaline Phosphatase (SEAP) activity using the reagent QUANTI-Blue (InvivoGen). The data show greater activity in the cleaved IL12 than in the full fusion protein. Constructs tested were ACP06 (FIG. 12A), ACP07 (FIG. 12C), ACP08 (FIG. 12B), ACP09 (FIG. 12D), ACP10 (FIG. 12E), ACP11 (FIG. 12F).

[39] **FIG. 13** shows results of protein cleavage assay. Fusion protein ACP11 was run on an SDS-PAGE gel in both cleaved and uncleaved form. As can be seen in the gel, cleavage was complete.

[40] **FIG. 14** is a schematic which depicts a non-limiting example of an inducible cytokine

protein, wherein the construct is activated upon protease cleavage of a linker attached between two subunits of the cytokine.

[41] **FIGs. 15A-15D** are graphs depicting results from a HEK-Blue assay performed on human p40/murine p35 IL12 fusion proteins before and after protease cleavage. Results confirm that IL12 protein fusion proteins are active. Each proliferation assay was performed with HSA or without HSA.

[42] **FIGs. 16A-16F** are a series of graphs showing activity of exemplary IFNγ fusion proteins compared to activity of mouse IFNγ control using WEHI 279 cell survival assay. Each assay was performed with medium containing HSA (+HSA) or not containing HSA (-HSA). Each fusion protein comprises an anti-HSA binder, and both uncleaved and MMP9 protease cleaved versions of the fusion protein were used in each assay.

[43] **FIGs. 17A-17F** are a series of graphs showing activity of exemplary IFNγ fusion proteins compared to activity of mouse IFNγ control using B16 reporter assay. Each assay was performed with medium containing HSA (+HSA) or not containing HSA (-HSA). Each fusion protein comprises an anti-HSA binder, and both uncleaved and MMP9 protease cleaved versions of the fusion protein were used in each assay.

[44] **FIGs. 18A-18B** show results of protein cleavage assay, as described in **Example 2**. Two constructs, ACP31 (IFN-α fusion protein; FIG. 18A) and ACP55 (IFN-γ fusion protein; 18B), were run on an SDS-PAGE gel in both cleaved and uncleaved form. As can be seen in the gel, cleavage was complete.

[45] **FIGs. 19A-19B** are a series of graphs (FIGS. 19A and 19B) showing activity of exemplary IFNγ fusion proteins before and after protease cleavage using B16 reporter assay. Each assay was performed with culture medium containing HSA, and each fusion protein comprises an anti-HSA binder. Both uncleaved and MMP9 protease cleaved versions of the fusion protein were used in each assay.

[46] **FIGs. 20A-20B** are a series of graphs (FIG. 20A and FIG. 20B) showing activity of exemplary IFNα fusion proteins before and after cleavage using a B16 reporter assay. Each assay was performed with medium containing HSA, and each fusion protein comprises an anti-HSA binder. Both uncleaved and MMP9 protease cleaved versions of the fusion protein were used in each assay.

[47] **FIGs. 21A-21D** are a series of graphs depicting the results of tumor growth studies using the MC38 cell line. **FIG. 21A-C** show the effect of IFNγ and IFNγ fusion proteins on tumor growth when injected intraperitoneally (IP) using different dosing levels and schedules (ug=micrograms, BID=twice daily, BIW= twice weekly, QW= weekly). **FIG. 21D** shows the effect of intratumoral (IT) injection of IFNγ and IL-2 on tumor growth.

[48] **FIGs. 22A-22B** are a series of graphs showing activity of exemplary IFNγ fusion proteins (ACP51 (FIG. 22A), and ACP52 (FIG. 22B)) cleaved by MMP9 protease compared to activity of uncleaved fusion proteins using B16 reporter assay. Each fusion protein comprises an anti-HSA

binder and a tumor targeting domain.

[49] **FIGs. 23A-23B** are a series of graphs showing activity of exemplary IFNγ fusion proteins (ACP53 and ACP54) cleaved by MMP9 protease compared to activity of uncleaved fusion proteins using B16 reporter assay. Each fusion protein comprises IFNγ directly fused to albumin.

[50] **FIGs. 24A-24D** are graphs depicting results from a HEK-Blue IL-2 reporter assay performed on IL-2 fusion proteins and recombinant human IL2 (Rec hIL-2). Analysis was performed based on quantification of Secreted Alkaline Phosphatase (SEAP) activity using the reagent QUANTI-Blue (InvivoGen). FIG. 24A shows results of IL-2 constructs ACP132 and ACP 133 with and without albumin. FIG. 24B shows results of IL-2 construct ACP16 cleaved and uncleaved. Results of a protein cleavage assay of ACP16 in cleaved and uncleaved forms is also depicted. FIG. 24C shows results of IL-2 construct ACP153 in cleaved and uncleaved forms. Results of a protein cleavage assay are also depicted. FIG. 24D illustrates the results from a HEK-Blue IL-2 assay using wild-type cytokine, intact fusion protein, and protease-cleaved fusion protein.

[51] **FIGs. 25A and 25B** are two graphs showing analysis of ACP16 (FIG. 25A) and ACP124 (FIG. 25B) in a HEKBlue IL-2 reporter assay in the presence of HSA. Circles depict the activity of the uncut polypeptide; squares depict activity of the cut polypeptide. **FIG. 25C** is a graph showing results of a CTLL-2 proliferation assay. CTLL2 cells (ATCC) were plated in suspension at a concentration of 500,000 cells/well in culture media with or without 40mg/ml human serum albumin (HSA) and stimulated with a dilution series of activatable hIL2 for 72 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved activatable ACP16 was tested. Cleaved activatable hIL2 was generated by incubation with active MMP9. Cell activity was assessed using a CellTiter-Glo (Promega) luminescence-based cell viability assay. Circles depict intact fusion protein, and squares depict protease-cleaved fusion protein.

[52] **FIGs. 26A-26C** are a series of graphs showing activity of fusion proteins in an HEKBlue IL-12 reporter assay. FIG. 26A depicts IL-12/STAT4 activation in a comparison of ACP11 (a human p40/murine p35 IL12 fusion protein) to ACP04 (negative control). FIG. 26B is a graph showing analysis of ACP91 (a chimeric IL-12 fusion protein). Squares depict activity of the uncut ACP91 polypeptide, and triangles depict the activity of the cut polypeptide (ACP91 + MMP9). EC50 values for each are shown in the table. FIG. 26C is a graph showing analysis of ACP136 (a chimeric IL-12 fusion protein). Squares depict activity of the uncut ACP136 polypeptide, and triangles depict the activity of the cut polypeptide (ACP136 + MMP9). EC50 values for each are shown in the table insert.

[53] **FIGs. 27A-27F** Fare a series of graphs showing that cleaved mouse IFNα1 polypeptides ACP31 (FIG. 27A), ACP125 (FIG. 27B), ACP126 (FIG. 27C) are active in an B16-Blue IFN-α/β reporter assay.

[54] **FIGs. 28A-28N** are a series of graphs depicting the activity of ACP56 (FIG. 28A), ACP57

(FIG. 28B) ACP58 (FIG. 28C), ACP59 (FIG. 28D), ACP60 (FIG. 28E), ACP61 + HSA (FIG. 28F), ACP30 + HSA (FIG. 28G), ACP73 (FIG. 28H), ACP70 + HSA (FIG. 28I), ACP71 (FIG. 28J), ACP72 (FIG. 28K), ACP 73 (FIG. 28L), ACP74 (FIG. 28M), and ACP75 (FIG. 28N) in a B16 IFNγ reporter assay. Each fusion was tested for its activity when cut (squares) and uncut (circles).

[55] **FIGs. 29A-29B** are two graphs showing results of analyzing ACP31 (mouse IFNα1 fusion protein) and ACP11 (a human p40/murine p35 IL12 fusion protein) in a tumor xenograft model. **FIG. 29A** shows tumor volume over time in mice treated with 33μg ACP31 (circles), 110μg ACP31 (triangles), 330μg ACP31 (diamonds), and as controls 1μg murine wild type IFNα1 (dashed line, squares) and 10 μg mIFNα1 (dashed line, small circles). Vehicle alone is indicated by large open circles. The data show tumor volume decreasing over time in a dose-dependent manner in mice treated with ACP31. **FIG. 29B** shows tumor volume over time in mice treated with 17.5μg ACP11 (squares), 175μg ACP31 (triangles), 525μg ACP31 (circles), and as controls 2μg ACP04 (dashed line, triangles) and 10 μg ACP04 (dashed line, diamonds). Vehicle alone is indicated by large open circles. The data show tumor volume decreasing over time in a dose-dependent manner in mice treated with both ACP11 and ACP04 (a human p40/murine p35 IL12 fusion protein).

[56] **FIGs. 30A-30F** are a series of spaghetti plots showing tumor volume over time in a mouse xenograft tumor model in mice each treated with vehicle alone (FIG. 30A), 2μg ACP04 (FIG. 30B), 10μg ACP04 (FIG. 30C), 17.5μg ACP11 (FIG. 30D), 175μg ACP11 (FIG. 30E), and 525μg ACP11 (FIG. 30F). Each line represents a single mouse.

[57] **FIG. 31A-31C** are three graphs showing results of analyzing ACP16 andACP124 in a tumor xenograft model. **FIG. 31A** shows tumor volume over time in mice treated with 4.4μg ACP16 (squares), 17μg ACP16 (triangles), 70μg ACP16 (downward triangles), 232μg ACP16 (dark circles), and as a comparator 12μg wild type IL-2 (dashed line, triangles) and 36μg wild type IL-2 (dashed line, diamonds. Vehicle alone is indicated by large open circles. The data show tumor volume decreasing over time in a dose-dependent manner in mice treated with ACP16 at higher concentrations. **FIG. 31B** shows tumor volume over time in mice treated with 17μg ACP124 (squares), 70μg ACP124 (triangles), 230μg ACP124 (downward triangles), and 700μg ACP124. Vehicle alone is indicated by large open circles. **FIG. 31C** shows tumor volume over time in mice treated with 17μg ACP16 (triangles), 70μg ACP16 (circles), 232μg ACP16 (dark circles), and as a comparator 17μg ACP124 (dashed line, triangles) 70μg ACP124 (dashed line, diamonds), 230μg ACP124 (dashed line, diamonds). Vehicle alone is indicated by dark downward triangles. The data show tumor volume decreasing over time in a dose-dependent manner in mice treated with ACP16, but not ACP124.

[58] **FIG. 32A-32B** are a series of spaghetti plots showing activity of fusion proteins in an MC38 mouse xenograft model corresponding to the data shown in FIG. 31. Each line in the plots is a single mouse.

[59] **FIG. 33** is a graph showing tumor volume over time in a mouse xenograft model showing tumor growth in control mice (open circles) and AP16-treated mice (squares).

[60] **FIGs. 34A-34D** are a series of survival plots showing survival of mice over time after treatment with cleavable fusion proteins. **FIG. 34A** shows data for mice treated with vehicle alone (gray line), 17μg ACP16 (dark line), and 17 μg ACP124 (dashed line). **FIG. 34B** shows data for mice treated with vehicle alone (gray line), 70μg ACP16 (dark line), and 70μg ACP124 (dashed line). **FIG. 34C** shows data for mice treated with vehicle alone (gray line), 232μg ACP16 (dark line), and 230μg ACP124 (dashed line). **FIG. 34D** shows data for mice treated with vehicle alone (gray line), 232μg ACP16 (dark line), and 700μg ACP124 (dashed line).

[61] **FIG. 35** a series of spaghetti plots showing activity of fusion proteins in an MC38 mouse xenograft model. All mouse groups were given four doses total except for the highest three doses of APC132, wherein fatal toxicity was detected after 1 week/2 doses. Shown are vehicle alone (top), 17, 55, 70, and 230 μg ACP16 (top full row), 9, 28, 36, and 119 μg ACP132 (middle full row), and 13, 42, 54, and 177 μg ACP21 (bottom full row). Each line in the plots represents an individual animal.

[62] **FIGs. 36A-36H** are a series of graphs showing activity of fusion proteins in the HEK-Blue IFN-α/β reporter assay. FIGs. 36A-36H depict activation of the IFN-α/β pathway in a comparison of human IFNα fusion protein) to control (human IFNα). Squares depict activity of the uncut IFNα polypeptide (intact) and triangles depict the activity of the cut IFNα polypeptide (cleaved). Circles depict activity of the control (human IFNα). EC50 values for each are shown in the table. Results confirm that the IFNα fusion proteins are active and inducible. FIGs. 36A-36H also depict results of the protein cleavage assay for each INFα fusion protein. Each INFα fusion protein was run on an SDS-PAGE gel in both cleaved and uncleaved form. As can be seen in the gel, cleavage was complete.

[63] **FIGs. 37A-37D** are a series of graphs showing activity of fusion proteins in the HEK-Blue IFN-α/β reporter assay. FIGs. 37A-37B depict activation of the IFN-α/β pathway in a comparison of a mouse INFβ fusion protein to control (mouse IFNβ). FIGs. 37C-37D depict activation of the IFN-α/β pathway in a comparison of a human INFβ fusion protein to control (human IFNβ). Squares depict activity of the uncut INFβ polypeptide (intact) and triangles depict the activity of the cut INFβ polypeptide (cleaved). Circles depict activity of the control. EC50 values for each are shown in the table. Results confirm that the IFNβ fusion proteins are active and inducible.

[64] **FIGs. 38A-38C** are a series of graphs showing activity of fusion proteins in the human PBMCs assay. FIGs. 38A-38C depict activation of the IFNα pathway in a comparison of human IFNα fusion protein to control (human IFNα). Squares depict activity of the uncut IFNα polypeptide (intact) and triangles depict the activity of the cut IFNα polypeptide (cleaved). Circles depict activity of the control human IFNα. EC50 values for each are shown in the table. Analysis was performed

based on quantification of CXCL-10 (IP-10). Results confirm that the IFNα fusion proteins are active and inducible.

[65] **FIGs. 39A-39G** show are results of analyzing INF fusion proteins in syngeneic MC38 mouse tumor model. **FIG. 39A** shows average tumor volume over time in mice treated with 369μg WW0610 (square), 553μg WW0610 (down triangle), 830μg WW0610 (up triangle), and 1,245μg WW0610 (circle). Vehicle alone is indicated by a black circle. **FIG. 39B** shows average tumor volume over time in mice treated with 1,231μg WW0815 (square), 1,845μg WW0815 (down triangle), 2,770μg WW0815 (up triangle), and 4,154μg WW0815 (circle). Vehicle alone is indicated by a black circle. **FIG. 39C** shows average tumor volume over time in mice treated with 4.6μg WW0644 (square), 9.3μg WW0644 (down triangle), 19μg WW0644 (up triangle), and 37μg WW0644 (circle). Vehicle alone is indicated by a black circle. **FIG. 39D** shows average tumor volume over time in mice treated with 31μg WW0816 (square), 62μg WW0816 (down triangle), 123μg WW0816 (up triangle), and 247μg WW0816 (circle). Vehicle alone is indicated by a black circle. **FIG. 39E** shows average tumor volume over time in mice treated with 110μg WW0609 (square), 830μg WW0609 (down triangle), and 1,320μg WW0609 (up triangle). **FIG. 39F** shows average tumor volume over time in mice treated with 110μg WW0610 (square), 830μg WW0610 (down triangle), and 1,320μg WW0610 (up triangle). **FIG. 39G** shows average tumor volume over time in mice treated with 0.3μg WW0643 (square), 1.5μg WW0643 (down triangle), 7.5μg WW0643 (up triangle), and 37.5μg WW0643 (diamond). Vehicle alone is indicated by a black circle.

[66] **FIG. 40A-40G** shows a series of spider plots showing activity of fusion proteins in an MC38 xenograft model corresponding to data in FIGs. 39A-39G. Each line in the plots is the tumor volume over time for a single mouse.

[67] **FIG. 41A-41G** show average percent body weight over time in mice treated with the INF fusion proteins in FIGs. 39A-39G.

[68] **FIGs. 42A-42E** shows the results of B16 IFN reporter assays. Inducible interferon constructs of interest were tested before and after cleavage. The relevant wildtype IFN was tested as a control.

[69] **FIG. 43** shows binding data of ACP16, ACP10, ACP11

[70] **FIGs. 44A-44D** depict the activity of cytokine fusion proteins constructs ACP243, ACP244, ACP243, ACP244, and ACP247.

[71] **FIG. 45** shows a series of spider plots showing tumor volume over time during treatment with vehicle, IL-12, ACP11 or ACP10.

[72] **FIGs. 46A-46D, 47A-47D, 48A, A8B, A9A-49I, 50A, 50B, and 51A-51C** shows data (tumor volume and/or body weight) for mice treated with cytokine fusion proteins constructs.

[73] **FIGs. 52A-52N, 53A, and 53B** depict the activity of cytokine fusion proteins constructs.

[74] **FIG. 54A-54N** shows the results of proliferation assays comparing cut protein, uncut protein, and IL2 as a control.

[75] **FIGs. 55A-55N** shows the results of HekBlue IL2 reporter assays comparing activity of constructs with and without protease cleavage; IL-2 is included as a control.

[76] **FIGs. 56, 57A-57D, 58, 59A-59Z** depict the activity of cytokine fusion proteins constructs.

[77] **FIGs. 60A-60G** shows a series of spider plots showing the impact of INF fusion proteins on body weight in an MC38 mouse xenograft model corresponding to the data shown in FIGs. 41A-41G. Each line in the plots is the body weight over time for a single mouse.

[78] **FIGs. 61A-61B** are a series of graphs showing activity of fusion proteins in the B16-Blue IFN-α/β reporter assay. FIG. 61A depicts activation of the IFN-α/β pathway for construct WW0609 in the presence and absence of albumin. FIG. 61B depicts activation of the IFN-α/β pathway for construct WW0643 in the presence and absence of albumin. Squares depict activity of the uncut INFα polypeptide (intact) and triangles depict the activity of the cut INFα polypeptide (cleaved). Circles depict activity of the control (mouse IFNα). EC50 values for each are shown in the table.

DETAILED DESCRIPTION

[79] Disclosed herein are methods and compositions to engineer and use constructs comprising inducible cytokines. Cytokines are potent immune agonists, which lead to them being considered promising therapeutic agents for oncology. However, cytokines proved to have a very narrow therapeutic window. Cytokines have short serum half-lives and are also considered to be highly potent. Consequently, therapeutic administration of cytokines produced undesirable systemic effects and toxicities. These were exacerbated by the need to administer large quantities of cytokine in order to achieve the desired levels of cytokine at the intended site of cytokine action (e.g., a tumor). Unfortunately, due to the biology of cytokines and inability to effectively target and control their activity, cytokines did not achieve the hoped-for clinical advantages in the treatment of tumors.

[80] Disclosed herein are fusion proteins that overcome the toxicity and short half-life problems that have severely limited the clinical use of cytokines in oncology. The fusion proteins contain cytokine polypeptides that have receptor agonist activity. But in the context of the fusion protein, the cytokine receptor agonist activity is attenuated, and the circulating half-life is extended. The fusion proteins include protease cleave sites, which are cleaved by proteases that are associated with a desired site of cytokine activity (e.g., a tumor), and are typically enriched or selectively present at the site of desired activity. Thus, the fusion proteins are preferentially (or selectively) and efficiently cleaved at the desired site of activity to limit cytokine activity substantially to the desired site of activity, such as the tumor microenvironment. Protease cleavage at the desired site of activity, such as in a tumor microenvironment, releases a form of the cytokine from the fusion protein that is much more active as a cytokine receptor agonist than the fusion protein (typically at least about 100X more active than the fusion protein). The form of the cytokine that is released upon cleavage of the fusion protein typically has a short half-life, which is often substantially similar to the half-life of the

naturally occurring cytokine, further restricting cytokine activity to the tumor microenvironment. Even though the half-life of the fusion protein is extended, toxicity is dramatically reduced or eliminated because the circulating fusion protein is attenuated, and active cytokine is targeted to the tumor microenvironment. The fusion proteins described herein, for the first time, enable the administration of an effective therapeutic dose of a cytokine to treat tumors with the activity of the cytokine substantially limited to the tumor microenvironment, and dramatically reduces or eliminates unwanted systemic effects and toxicity of the cytokine.

[81] The fusion proteins disclosed herein typically comprise a cytokine polypeptide [A], a blocking moiety [D], optionally a half-life extension moiety [H], and a protease-cleavable polypeptide linker. The cytokine polypeptide and the blocking moiety and the optional half-life extension element when present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, e.g., the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker. Some preferred fusion polypeptides are of one of formula (I) – (VI):

[A]-[L1]-[H]-[L2]-[D] (I);

[D]-[L2]-[H]-[L1]-[A] (II);

[A]-[L1]-[D]-[L2]-[H] (III);

[H]-[L2]-[D]-[L1]-[A] (IV);

[H]-[L1]-[A]-[L2']-[D] (V);

[D]-[L1]-[A]-[L2']-[H] (VI);

wherein [A] is a cytokine polypeptide, [D] is a blocking moiety, [H] is a half-life extension moiety, [L1] is a protease-cleavable polypeptide linker, [L2] is an polypeptide linker that is optionally protease-cleavable, and [L2'] is a protease-cleavable polypeptide linker. [L1] and [L2] or [L1] and [L2'] can be have the same or different amino acid sequence and or protease-cleavage site (when L2 is protease-cleavable) as desired.

[82] This disclosure further relates to pharmaceutical compositions that contain the inducible fusion protein and an additional therapeutic agent, as well as nucleic acids that encode the polypeptides, and recombinant expression vectors and host sells for making such fusion proteins. Also provided herein are methods of using the disclosed fusion proteins in the treatment of diseases, conditions, and disorders.

[83] Unless otherwise defined, all terms of art, notations and other scientific terminology used herein are intended to have the meanings commonly understood by those of skill in the art to which this invention pertains. In some cases, terms with commonly understood meanings are defined herein for clarity and/or for ready reference, and the inclusion of such definitions herein should not necessarily be construed to represent a difference over what is generally understood in the art. The

techniques and procedures described or referenced herein are generally well understood and commonly employed using conventional methodologies by those skilled in the art, such as, for example, the widely utilized molecular cloning methodologies described in Sambrook et al., *Molecular Cloning: A Laboratory Manual* 4th ed. (2012) Cold Spring Harbor Laboratory Press, Cold Spring Harbor, NY. As appropriate, procedures involving the use of commercially available kits and reagents are generally carried out in accordance with manufacturer-defined protocols and conditions unless otherwise noted.

[84] "Cytokine" is a well-known term of art that refers to any of a class of immunoregulatory proteins (such as interleukin or interferon) that are secreted by cells especially of the immune system and that are modulators of the immune system. Cytokine polypeptides that can be used in the fusion proteins disclosed herein include, but are not limited to transforming growth factors, such as TGF-α and TGF-β (e.g., TGFbeta1, TGFbeta2, TGFbeta3); interferons, such as interferon-α, interferon-β, interferon-γ, interferon-kappa and interferon-omega; interleukins, such as IL-1, IL-1α, IL-2, IL-3, IL-4, IL-5, IL-6, IL-7, IL-8, IL-9, IL-10, IL-11, IL-12, IL-13, IL-14, IL-15, IL-16, IL-17, IL-18, IL-21 and IL-25; tumor necrosis factors, such as tumor necrosis factor alpha and lymphotoxin; chemokines (e.g., C-X-C motif chemokine 10 (CXCL10), CCL19, CCL20, CCL21), and granulocyte macrophage-colony stimulating factor (GM-CS), as well as fragments of such polypeptides that active the cognate receptors for the cytokine (i.e., functional fragments of the foregoing). "Chemokine" is a term of art that refers to any of a family of small cytokines with the ability to induce directed chemotaxis in nearby responsive cells.

[85] Cytokines are well-known to have short serum half-lives that frequently are only a few minutes or hours. Even forms of cytokines that have altered amino acid sequences intended to extend the serum half-life yet retain receptor agonist activity typically also have short serum half-lives. As used herein, a "short-half-life cytokine" refers to a cytokine that has a substantially brief half-life circulating in the serum of a subject, such as a serum half-life that is less than 10, less than 15, less than 30, less than 60, less than 90, less than 120, less than 240, or less than 480 minutes. As used herein, a short half-life cytokine includes cytokines which have not been modified in their sequence to achieve a longer than usual half-life in the body of a subject and polypeptides that have altered amino acid sequences intended to extend the serum half-life yet retain receptor agonist activity. This latter case is not meant to include the addition of heterologous protein domains, such as a bona fide half-life extension element, such as serum albumin.

[86] "Sortases" are transpeptidases that modify proteins by recognizing and cleaving a carboxyl-terminal sorting signal embedded in or terminally attached to a target protein or peptide. Sortase A catalyzes the cleavage of the LPXTG motif (SEQ ID NO.: 442) (where X is any standard amino acid) between the Thr and Gly residue on the target protein, with transient attachment of the Thr residue to the active site Cys residue on the enzyme, forming an enzyme-thioacyl intermediate. To complete

transpeptidation and create the peptide-monomer conjugate, a biomolecule with an N-terminal nucleophilic group, typically an oligoglycine motif, attacks the intermediate, displacing Sortase A and joining the two molecules.

[87] As used herein, the term "steric blocker" refers to a polypeptide or polypeptide moiety that can be covalently bonded to a cytokine polypeptide directly or indirectly through other moieties such as linkers, for example in the form of a chimeric polypeptide (fusion protein), but otherwise does not covalently bond to the cytokine polypeptide. A steric blocker can non-covalently bond to the cytokine polypeptide, for example though electrostatic, hydrophobic, ionic or hydrogen bonding. A steric blocker typically inhibits or blocks the activity of the cytokine moiety due to its proximity to the cytokine moiety and comparative size. A steric blocker may also block by virtue of recruitment of a large protein binding partner. An example of this is an antibody which binds to serum albumin; while the antibody itself may or may not be large enough to block activation or binding on its own, recruitment of albumin allows for sufficient steric blocking.

[88] As used and described herein, a "half-life extension element" is a part of the chimeric polypeptide that increases the serum half-life and improve pK, for example, by altering its size (e.g., to be above the kidney filtration cutoff), shape, hydrodynamic radius, charge, or parameters of absorption, biodistribution, metabolism, and elimination.

[89] As used herein, the terms "activatable," "activate," "induce," and "inducible" refer to the ability of a protein, i.e. a cytokine, that is part of a fusion protein, to bind its receptor and effectuate activity upon cleavage of additional elements from the fusion protein.

[90] As used herein, "plasmids" or "viral vectors" are agents that transport the disclosed nucleic acids into the cell without degradation and include a promoter yielding expression of the nucleic acid molecule and/or polypeptide in the cells into which it is delivered.

[91] As used herein, the terms "peptide", "polypeptide", or "protein" are used broadly to mean two or more amino acids linked by a peptide bond. Protein, peptide, and polypeptide are also used herein interchangeably to refer to amino acid sequences. It should be recognized that the term polypeptide is not used herein to suggest a particular size or number of amino acids comprising the molecule and that a peptide of the invention can contain up to several amino acid residues or more.

[92] As used throughout, "subject" can be a vertebrate, more specifically a mammal (e.g. a human, horse, cat, dog, cow, pig, sheep, goat, mouse, rabbit, rat, and guinea pig), birds, reptiles, amphibians, fish, and any other animal. The term does not denote a particular age or sex. Thus, adult and newborn subjects, whether male or female, are intended to be covered.

[93] As used herein, "patient" or "subject" may be used interchangeably and can refer to a subject with a disease or disorder (e.g. cancer). The term patient or subject includes human and veterinary subjects.

[94] As used herein the terms "treatment", "treat", or "treating" refers to a method of reducing the

effects of a disease or condition or symptom of the disease or condition. Thus, in the disclosed method, treatment can refer to at least about 10%, at least about 20%, at least about 30%, at least about 40%, at least about 50%, at least about 60%, at least about 70%, at least about 80%, at least about 90%, or substantially complete reduction in the severity of an established disease or condition or symptom of the disease or condition. For example, a method for treating a disease is considered to be a treatment if there is a 10% reduction in one or more symptoms of the disease in a subject as compared to a control. Thus, the reduction can be a 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%, or any percent reduction in between 10% and 100% as compared to native or control levels. It is understood that treatment does not necessarily refer to a cure or complete ablation of the disease, condition, or symptoms of the disease or condition.

[95] As used herein, the terms "prevent", "preventing", and "prevention" of a disease or disorder refers to an action, for example, administration of the chimeric polypeptide or nucleic acid sequence encoding the chimeric polypeptide, that occurs before or at about the same time a subject begins to show one or more symptoms of the disease or disorder, which inhibits or delays onset or exacerbation of one or more symptoms of the disease or disorder.

[96] As used herein, references to "decreasing", "reducing", or "inhibiting" include a change of at least about 10%, of at least about 20%, of at least about 30%, of at least about 40%, of at least about 50%, of at least about 60%, of at least about 70%, of at least about 80%, of at least about 90% or greater as compared to a suitable control level. Such terms can include but do not necessarily include complete elimination of a function or property, such as agonist activity.

[97] An "attenuated cytokine receptor agonist" is a cytokine receptor agonist that has decreased receptor agonist activity as compared to the cytokine receptor's naturally occurring agonist. An attenuated cytokine agonist may have at least about 10X, at least about 50X, at least about 100X, at least about 250X, at least about 500X, at least about 1000X or less agonist activity as compared to the receptor's naturally occurring agonist. When a fusion protein that contains a cytokine polypeptide as described herein is described as "attenuated" or having "attenuated activity", it is meant that the fusion protein is an attenuated cytokine receptor agonist.

[98] An "intact fusion protein" is a fusion protein in which no domain has been removed, for example by protease cleavage. A domain may be removable by protease cleavage or other enzymatic activity, but when the fusion protein is "intact", this has not occurred.

[99] As used herein "moiety" refers to a portion of a molecule that has a distinct function within that molecule, and that function may be performed by that moiety in the context of another molecule. A moiety may be a chemical entity with a particular function, or a portion of a biological molecule with a particular function. For example, a "blocking moiety" within a fusion protein is a portion of the fusion protein which is capable of blocking the activity of some or all of the fusion polypeptide. This may be a protein domain, such as serum albumin. Blocking may be accomplished by a steric blocker

or a specific blocker. A steric blocker blocks by virtue of size and position and not based upon specific binding; an examples is serum albumin. A specific blocker blocks by virtue of specific interactions with the moiety to be blocked. A specific blocker must be tailored to the particular cytokine or active domain; a steric blocker can be used regardless of the payload, as long as it is large enough. If desired a blocking moiety that is incorporated into a fusion proteins described herein can associate with another polypeptide to create a specific binding domain. For example, if a cytokine binding fragment of an antibody is used as the blocking moiety, the fusion polypeptide can include an scFv that is specific for the cytokine as the blocking moiety or the fusion polypeptide can comprise half of a Fab, for example VH-CH1 or VL-CL as the blocking moity, which can associate with a complementary chain VL-CL or VH-CH1, respectively, to form an Fab fragment that specifically binds the cytokine. As further described herein, the blocking moiety may block activity of the fusion protein directly or when the blocking moiety associates with another polypeptide. For example, when an anti-HSA scFv binds HSA or when a VH-CH1 polypeptide associates with a complementary VL-CL polypeptide and then binds the cytokine polypeptide.

[100] In general, the therapeutic use of cytokines is strongly limited by their systemic toxicity. TNF, for example, was originally discovered for its capacity of inducing the hemorrhagic necrosis of some tumors, and for its in vitro cytotoxic effect on different tumoral lines, but it subsequently proved to have strong pro-inflammatory activity, which can, in case of overproduction conditions, dangerously affect the human body. As the systemic toxicity is a fundamental problem with the use of pharmacologically active amounts of cytokines in humans, novel derivatives and therapeutic strategies are now under evaluation, aimed at reducing the toxic effects of this class of biological effectors while keeping their therapeutic efficacy.

[101] IL-2 exerts both stimulatory and regulatory functions in the immune system and is, along with other members of the common γ chain (γc) cytokine family, central to immune homeostasis. IL-2 mediates its action by binding to IL-2 receptors (IL-2R), consisting of either trimeric receptors made of IL-2Rα (CD25), IL-2Rβ (CD122), and IL-2Rγ (γc, CD132) chains or dimeric βγ IL-2Rs (1, 3). Both IL-2R variants are able to transmit signal upon IL-2 binding. However, trimeric αβγ IL-2Rs have a roughly 10–100 times higher affinity for IL-2 than dimeric βγ IL-2Rs (3), implicating that CD25 confers high-affinity binding of IL-2 to its receptor but is not crucial for signal transduction. Trimeric IL-2Rs are found on activated T cells and CD4+ forkhead box P3 (FoxP3)+ T regulatory cells (Treg), which are sensitive to IL-2 in vitro and in vivo. Conversely, antigen-experienced (memory) CD8+, CD44 high memory-phenotype (MP) CD8+, and natural killer (NK) cells are endowed with high levels of dimeric βγ IL-2Rs, and these cells also respond vigorously to IL-2 *in vitro* and *in vivo*.

[102] Expression of the high-affinity IL-2R is critical for endowing T cells to respond to low concentrations of IL-2 that is transiently available in vivo. IL-2Rα expression is absent on naive and

memory T cells but is induced after antigen activation. IL-2Rβ is constitutively expressed by NK, NKT, and memory CD8+ T cells but is also induced on naive T cells after antigen activation. γc is much less stringently regulated and is constitutively expressed by all lymphoid cells. Once the high-affinity IL-2R is induced by antigen, IL-2R signaling upregulates the expression of IL-2Rα in part through Stat5-dependent regulation of Il2ra transcription (Kim et al., 2001). This process represents a mechanism to maintain expression of the high-affinity IL-2R and sustain IL-2 signaling while there remains a source of IL-2.

[103] IL-2 is captured by IL-2Rα through a large hydrophobic binding surface surrounded by a polar periphery that results in a relatively weak interaction (Kd 10−8 M) with rapid on-off binding kinetics. However, the IL-2Rα-IL-2 binary complex leads to a very small conformational change in IL-2 that promotes association with IL-2Rβ through a distinct polar interaction between IL-2 and IL-2Rβ. The pseudo-high affinity of the IL2/α/β trimeric complex (i.e. Kd ~300 pM) clearly indicates that the trimeric complex is more stable than either IL2 bound to the α chain alone (Kd = 10 nM) or to the β chain alone (Kd = 450 nM) as shown by Ciardelli's data. In any event, the IL2/α/β trimer then recruits the γ chain into the quaternary complex capable of signaling, which is facilitated by the large composite binding site on the IL2-bound β chain for the γ chain.

[104] In other words, the ternary IL-2Rα-IL-2Rβ-IL-2 complex then recruits γc through a weak interaction with IL-2 and a stronger interaction with IL-2Rβ to produce a stable quaternary high-affinity IL-2R (Kd 10−11 M which is 10 pM). The formation of the high-affinity quaternary IL-2-IL-2R complex leads to signal transduction through the tyrosine kinases Jak1 and Jak3, which are associated with IL-2Rβ and γc, respectively (Nelson and Willerford, 1998). The quaternary IL-2-IL-2R complex is rapidly internalized, where IL-2, IL-2Rβ, and γc are rapidly degraded, but IL-2Rα is recycled to the cell surface (Hémar et al., 1995; Yu and Malek, 2001). Thus, those functional activities that require sustained IL-2R signaling require a continued source of IL-2 to engage IL-2Rα and form additional IL-2-IL-2R signaling complexes.

[105] Interleukin-15 (IL-15), another member of the 4-alpha-helix bundle family of cytokines, has also emerged as an immunomodulator for the treatment of cancer. IL-15 is initially captured via IL-15Rα, which is expressed on antigen-presenting dendritic cells, monocytes and macrophages. IL-15 exhibits broad activity and induces the differentiation and proliferation of T, B and natural killer (NK) cells via signaling through the IL-15/IL-2-R-β (CD122) and the common γ chain (CD132). It also enhances cytolytic activity of $CD8^+$ T cells and induces long-lasting antigen-experienced $CD8^+CD44$ memory T cells. IL-15 stimulates differentiation and immunoglobulin synthesis by B cells and induces maturation of dendritic cells. It does not stimulate immunosuppressive T regulatory cells (Tregs). Thus, boosting IL-15 activity selectively in the tumor micro-environment could enhance innate and specific immunity and fight tumors (Waldmann et al., 2012). IL-15 was initially identified for its ability to stimulate T cell proliferation in an IL-2-like manner through common receptor

components (IL-2R/15Rβ-γc) and signaling through JAK1/JAK3 and STAT3/STAT5. Like IL-2, IL-15 has been shown to stimulate proliferation of activated CD4-CD8-, CD4+CD8+, CD4+ and CD8+ T cells as well as facilitate the induction of cytotoxic T-lymphocytes, and the generation, proliferation and activation of NK cells (Waldmann et al., 1999). However, unlike IL-2 which is required to maintain forkhead box P3 (FOXP3)-expressing CD4+CD25+ Treg cells and for the retention of these cells in the periphery, IL-15 has little effect on Tregs (Berger et al., 2009). This is important as FOXP3-expressing CD4+CD25+ Tregs inhibit effector T cells, thereby inhibiting immune responses including those directed against the tumor. IL-2 also has a crucial role in initiating activation induced cell death (AICD), a process that leads to the elimination of self-reactive T cells, whereas IL-15 is an anti-apoptotic factor for T cells (Marks-Konczalik et al., 2000). IL-15 co-delivered with HIV peptide vaccines has been shown to overcome CD4+ T cell deficiency by promoting longevity of antigen-specific CD8+ T cells and blocking TRAIL- mediated apoptosis (Oh et al., 2008). Furthermore, IL-15 promotes the long-term maintenance of CD8+CD44hi memory T cells (Kanegane et al., 1996).

[106] The importance of IL-15 and IL-15Rα to T and NK cell development is further highlighted by the phenotype of IL-15Rα$^{-/-}$ and IL-15$^{-/-}$ mice. Knockout mice demonstrate decreased numbers of total CD8+ T cells, and are deficient in memory-phenotype CD8+ T cells, NK cells, NK/T cells and some subsets of intestinal intraepithelial lymphocytes, indicating that IL-15 provides essential positive homeostatic functions for these subsets of cells (Lodolce et al., 1996; Kennedy et al., 1998). The similarities in the phenotypes of these two strains of knockout mice suggest the importance of IL-15Rα in maintaining physiologically relevant IL-15 signals.

[107] IL-15 is presented in trans by the IL-15 receptor alpha-chain to the IL-15Rβγc complex displayed on the surface of T cells and natural killer (NK) cells (Han et al., 2011). The IL-15Ra-chain plays a role of chaperone protein, stabilizes, and increases IL-15 activity (Desbois et al., 2016). It has been shown that exogenous IL-15 may have a limited impact on patients with cancer due to its dependency on IL-15Ra frequently downregulated in cancer patients. Therefore, the fusion protein RLI, composed of the sushi+ domain of IL15Ra coupled via a linker to IL-15, has been suggested as an alternative approach to IL15 therapy (Bessard et al., 2009). It was found that administration of soluble IL-15/IL-15Rα complexes greatly enhanced IL-15 serum half-life and bioavailability in vivo (Stoklasek et al., 2010).

[108] In addition to the effects on T and NK cells, IL-15 also has several effects on other components of the immune system. IL-15 protects neutrophils from apoptosis, modulates phagocytosis and stimulates the secretion of IL-8 and IL-1R antagonist. It functions through the activation of JAK2, p38 and ERK1/2 MAPK, Syk kinase and the NF-kB transcriptional factor (Pelletier et al., 2002). In mast cells, IL-15 can act as a growth factor and an inhibitor of apoptosis. In these cells IL-15 activates the JAK2/STAT5 pathway without the requirement of γc binding (Tagaya et al., 1996). IL-15 also induces B lymphocyte proliferation and differentiation, and increases

immunoglobulin secretion (Armitage et al., 1995). It also prevents Fas-mediated apoptosis and allows induction of antibody responses partially independent of CD4-help (Demerci et al., 2004; Steel et al., 2010). Monocytes, macrophages and dendritic cells effectively transcribe and translate IL-15. They also respond to IL-15 stimulation. Macrophages respond by increasing phagocytosis, inducing IL-8, IL-12 and MCP-1 expression, and secreting IL-6, IL-8 and TNF α (Budagian et al., 2006). Dendritic cells incubated with IL-15 demonstrate maturation with increased CD83, CD86, CD40, and MHC class II expression, are also resistant to apoptosis, and show enhanced interferon-γ secretion (Anguille et al., 2009).

[109] IL-15 has also been shown to have effects on non-hematological cells including myocytes, adipocytes, endothelial and neural cells. IL-15 has an anabolic effect on muscle and may support muscle cell differentiation (Quinn et al., 1995). It stimulates myocytes and muscle fibers to accumulate contractile protein and is able to slow muscle wasting in rats with cancer-related cachexia (Figueras et al., 2004). IL-15 has also been shown to stimulate angiogenesis (Angiolillo et al., 1997) and induce microglial growth and survival (Hanisch et al., 1997).

[110] Interleukin-7 (IL-7), also of the IL-2/IL-15 family, is a well-characterized pleiotropic cytokine, and is expressed by stromal cells, epithelial cells, endothelial cells, fibroblasts, smooth muscle cells and keratinocytes, and following activation, by dendritic cells (Alpdogan et al., 2005). Although it was originally described as a growth and differentiation factor for precursor B lymphocytes, subsequent studies have shown that IL-7 is critically involved in T-lymphocyte development and differentiation. Interleukin-7 signaling is essential for optimal CD8 T-cell function, homeostasis and establishment of memory (Schluns et al., 2000); it is required for the survival of most T-cell subsets, and its expression has been proposed to be important for regulating T-cell numbers.

[111] IL-7 binds to a dimeric receptor, including IL-7Rα and γ_c to form a ternary complex that plays fundamental roles in extracellular matrix remodeling, development, and homeostasis of T and B cells (Mazzucchelli and Durum, 2007). IL-7Rα also cross-reacts to form a ternary complex with thymic stromal lymphopoietin (TSLP) and its receptor (TSLPR), and activates the TSLP pathway, resulting in T and dendritic cell proliferation in humans and further B cell development in mice (Leonard, 2002). Tight regulation of the signaling cascades activated by the complexes are therefore crucial to normal cellular function. Under-stimulation of the IL-7 pathway caused by mutations in the IL-7Rα ectodomain inhibits T and B cell development, resulting in patients with a form of severe combined immunodeficiency (SCID) (Giliani et al., 2005; Puel et al., 1998).

[112] IL-7 has a potential role in enhancing immune reconstitution in cancer patients following cytotoxic chemotherapy. IL-7 therapy enhances immune reconstitution and can augment even limited thymic function by facilitating peripheral expansion of even small numbers of recent thymic emigrants. Therefore, IL-7 therapy could potentially repair the immune system of patients who have been depleted by cytotoxic chemotherapy (Capitini et al., 2010).

[113] Interleukin-12 (IL-12) is a disulfide-linked heterodimer of two separately encoded subunits (p35 and p40), which are linked covalently to give rise to the so-called bioactive heterodimeric (p70) molecule (Lieschke et al., 1997; Jana et al., 2014). Apart from forming heterodimers (IL-12 and IL-23), the p40 subunit is also secreted as a monomer (p40) and a homodimer ($p40_2$). It is known in the art that synthesis of the heterodimer as a single chain with a linker connecting the p35 to the p40 subunit preserves the full biological activity of the heterodimer. IL-12 plays a critical role in the early inflammatory response to infection and in the generation of Th1 cells, which favor cell-mediated immunity. It has been found that overproduction of IL-12 can be dangerous to the host because it is involved in the pathogenesis of a number of autoimmune inflammatory diseases (e.g. MS, arthritis, type 1 diabetes).

[114] The IL-12 receptor (IL-12R) is a heterodimeric complex consisting of IL-12Rβ1 and IL-12Rβ2 chains expressed on the surface of activated T-cells and natural killer cells (Trinchieri et al., 2003). The IL-12Rβ1 chain binds to the IL-12p40 subunit, whereas IL-12p35 in association with IL-12Rβ2 confers an intracellular signaling ability (Benson et al., 2011). Signal transduction through IL-12R induces phosphorylation of Janus kinase (Jak2) and tyrosine kinase (Tyk2), that phosphorylate and activate signal transducer and activator of transcription (STAT)1, STAT3, STAT4, and STAT5. The specific cellular effects of IL-12 are due mainly to activation of STAT4. IL-12 induces natural killer and T-cells to produce cytokines, in particular interferon (IFN)γ, that mediate many of the proinflammatory activities of IL-12, including CD4+ T-cell differentiation toward the Th1 phenotype (Montepaone et al., 2014).

[115] Regulatory T cells actively suppress activation of the immune system and prevent pathological self-reactivity and consequent autoimmune disease. Developing drugs and methods to selectively activate regulatory T cells for the treatment of autoimmune disease is the subject of intense research and, until the development of the present invention, which can selectively deliver active interleukins at the site of inflammation, has been largely unsuccessful. Regulatory T cells (Treg) are a class of CD4+CD25+ T cells that suppress the activity of other immune cells. Treg are central to immune system homeostasis, and play a major role in maintaining tolerance to self-antigens and in modulating the immune response to foreign antigens. Multiple autoimmune and inflammatory diseases, including Type 1 Diabetes (T1D), Systemic Lupus Erythematosus (SLE), and Graft-versus-Host Disease (GVHD) have been shown to have a deficiency of Treg cell numbers or Treg function.

[116] Consequently, there is great interest in the development of therapies that boost the numbers and/or function of Treg cells. One treatment approach for autoimmune diseases being investigated is the transplantation of autologous, ex vivo-expanded Treg cells (Tang, Q., et al, 2013, Cold Spring Harb. Perspect. Med., 3:1-15). While this approach has shown promise in treating animal models of disease and in several early stage human clinical trials, it requires personalized treatment with the patient's own T cells, is invasive, and is technically complex. Another approach is treatment with low

dose Interleukin-2 (IL-2). Treg cells characteristically express high constitutive levels of the high affinity IL-2 receptor, IL2Rαβγ, which is composed of the subunits IL2Rα (CD25), IL2Rβ (CD122), and IL2Rγ (CD132), and Treg cell growth has been shown to be dependent on IL-2 (Malek, T. R., et al., 2010, Immunity, 33:153-65).

[117] Conversely, immune activation has also been achieved using IL-2, and recombinant IL-2 (Proleukin®) has been approved to treat certain cancers. High-dose IL-2 is used for the treatment of patients with metastatic melanoma and metastatic renal cell carcinoma with a long-term impact on overall survival.

[118] Clinical trials of low-dose IL-2 treatment of chronic GVHD (Koreth, J., et al., 2011, N Engl J Med., 365:2055-66) and HCV-associated autoimmune vasculitis patients (Saadoun, D., et al., 2011, N Engl J Med., 365:2067-77) have demonstrated increased Treg levels and signs of clinical efficacy. New clinical trials investigating the efficacy of IL-2 in multiple other autoimmune and inflammatory diseases have been initiated. The rationale for using so-called low dose IL-2 was to exploit the high IL-2 affinity of the trimeric IL-2 receptor which is constitutively expressed on Tregs while leaving other T cells which do not express the high affinity receptor in the inactivated state. Aldesleukin (marketed as Proleukin® by Prometheus Laboratories, San Diego, CA), the recombinant form of IL-2 used in these trials, is associated with high toxicity. Aldesleukin, at high doses, is approved for the treatment of metastatic melanoma and metastatic renal cancer, but its side effects are so severe that its use is only recommended in a hospital setting with access to intensive care (Web address: www.proleukin.com/assets/pdf/proleukin.pdf).

[119] The clinical trials of IL-2 in autoimmune diseases have employed lower doses of IL-2 in order to target Treg cells, because Treg cells respond to lower concentrations of IL-2 than many other immune cell types due to their expression of IL2R alpha (Klatzmann D, 2015 Nat Rev Immunol. 15:283-94). However, even these lower doses resulted in safety and tolerability issues, and the treatments used have employed daily subcutaneous injections, either chronically or in intermittent 5-day treatment courses. Therefore, there is a need for an autoimmune disease therapy that potentiates Treg cell numbers and function, that targets Treg cells more specifically than IL- 2, that is safer and more tolerable, and that is administered less frequently.

[120] One approach that has been suggested for improving the therapeutic index of IL-2-based therapy for autoimmune diseases is to use variants of IL-2 that are selective for Treg cells relative to other immune cells. IL-2 receptors are expressed on a variety of different immune cell types, including T cells, NK cells, eosinophils, and monocytes, and this broad expression pattern likely contributes to its pleiotropic effect on the immune system and high systemic toxicity. In particular, activated T effector cells express IL2Rαβγ, as do pulmonary epithelial cells. But, activating T effector cells runs directly counter to the goal of down-modulating and controlling an immune response, and activating pulmonary epithelial cells leads to known dose-limiting side effects of IL-2

including pulmonary edema. In fact, the major side effect of high-dose IL-2 immunotherapy is vascular leak syndrome (VLS), which leads to accumulation of intravascular fluid in organs such as lungs and liver with subsequent pulmonary edema and liver cell damage. There is no treatment of VLS other than withdrawal of IL-2. Low-dose IL-2 regimens have been tested in patients to avoid VLS, however, at the expense of suboptimal therapeutic results.

[121] According to the literature, VLS is believed to be caused by the release of proinflammatory cytokines from IL-2–activated NK cells. However, there is some evidence that pulmonary edema results from direct binding of IL-2 to lung endothelial cells, which expressed low to intermediate levels of functional αβγ IL-2Rs. And, the pulmonary edema associated with interaction of IL-2 with lung endothelial cells was abrogated by blocking binding to CD25 with an anti-CD25 monoclonal antibody (mAb), in CD25-deficient host mice, or by the use of CD122-specific IL-2/anti-IL-2 mAb (IL-2/mAb) complexes, thus preventing VLS.

[122] Treatment with interleukin cytokines other than IL-2 has been more limited. IL-15 displays immune cell stimulatory activity similar to that of IL-2 but without the same inhibitory effects, thus making it a promising immunotherapeutic candidate. Clinical trials of recombinant human IL-15 for the treatment of metastatic malignant melanoma or renal cell cancer demonstrated appreciable changes in immune cell distribution, proliferation, and activation and suggested potential antitumor activity (Conlon et. al., 2014). IL-15 is currently in clinical trials to treat various forms of cancer. However, IL-15 therapy is known to be associated with undesired and toxic effects, such as exacerbating certain leukemias, graft-versus-host disease, hypotension, thrombocytopenia, and liver injury. (Mishra A., et al., Cancer Cell, 2012, 22(5):645-55; Alpdogan O. et al., Blood, 2005, 105(2):866-73; Conlon KC et al., J Clin Oncol, 2015, 33(1):74-82.)

[123] IL-7 promotes lymphocyte development in the thymus and maintains survival of naive and memory T cell homeostasis in the periphery. Moreover, it is important for the organogenesis of lymph nodes (LN) and for the maintenance of activated T cells recruited into the secondary lymphoid organs (SLOs) (Gao et. al., 2015). In clinical trials of IL-7, patients receiving IL-7 showed increases in both CD4+ and CD8+ T cells, with no significant increase in regulatory T cell numbers as monitored by FoxP3 expression (Sportes et al., 2008). In clinical trials reported in 2006, 2008 and 2010, patients with different kinds of cancers such as metastatic melanoma or sarcoma were injected subcutaneously with different doses of IL-7. Little toxicity was seen except for transient fevers and mild erythema. Circulating levels of both CD4+ and CD8+ T cells increased significantly and the number of Treg reduced. TCR repertoire diversity increased after IL-7 therapy. However, the anti-tumor activity of IL-7 was not well evaluated (Gao et. al., 2015). Results suggest that IL-7 therapy could enhance and broaden immune responses.

[124] IL-12 is a pleiotropic cytokine, the actions of which create an interconnection between the innate and adaptive immunity. IL-12 was first described as a factor secreted from PMA-induced EBV-

transformed B-cell lines. Based on its actions, IL-12 has been designated as cytotoxic lymphocyte maturation factor and natural killer cell stimulatory factor. Due to bridging the innate and adaptive immunity and potently stimulating the production of IFNγ, a cytokine coordinating natural mechanisms of anticancer defense, IL-12 seemed ideal candidate for tumor immunotherapy in humans. However, severe side effects associated with systemic administration of IL-12 in clinical investigations and the very narrow therapeutic index of this cytokine markedly tempered enthusiasm for the use of this cytokine in cancer patients (Lasek et. al., 2014). Approaches to IL-12 therapy in which delivery of the cytokine is tumor-targeted, which may diminish some of the previous issues with IL-12 therapy, are currently in clinical trials for cancers.

[125] The direct use of IL-2 as an agonist to bind the IL-2R and modulate immune responses therapeutically has been problematic due its well-documented therapeutic risks, e.g., its short serum half-life and high toxicity. These risks have also limited the therapeutic development and use of other cytokines. New forms of cytokines that reduce these risks are needed. Disclosed herein are compositions and methods comprising IL-2 and IL-15 and other cytokines, functional fragments and muteins of cytokines, variants, and subunits of cytokines as well as conditionally active cytokines designed to address these risks and provide needed immunomodulatory therapeutics.

[126] The present invention is designed to address the shortcomings of direct IL-2 therapy and therapy using other cytokines, for example using cytokine blocking moieties, e.g. steric blocking polypeptides, serum half-life extending polypeptides, targeting polypeptides, linking polypeptides, including protease cleavable linkers, and combinations thereof. Cytokines, including interleukins (e.g., IL-2, IL-7, IL-12, IL-15, IL-18, IL-21 IL-23), interferons (IFNs, including IFNalpha, IFNbeta and IFNgamma), tumor necrosis factors (e.g., TNFalpha, lymphotoxin), transforming growth factors (e.g., TGFbeta1, TGFbeta2, TGFbeta3), chemokines (C-X-C motif chemokine 10 (CXCL10), CCL19, CCL20, CCL21), and granulocyte macrophage-colony stimulating factor (GM-CS) are highly potent when administered to patients. As used herein, "chemokine" means a family of small cytokines with the ability to induce directed chemotaxis in nearby responsive cells Cytokines can provide powerful therapy, but are accompanied by undesired effects that are difficult to control clinically and which have limited the clinical use of cytokines. This disclosure relates to new forms of cytokines that can be used in patients with reduced or eliminated undesired effects. In particular, this disclosure relates to pharmaceutical compositions including chimeric polypeptides (fusion proteins), nucleic acids encoding fusion proteins and pharmaceutical formulations of the foregoing that contain cytokines or active fragments or muteins of cytokines that have decreased cytokine receptor activating activity in comparison to the corresponding cytokine. However, under selected conditions or in a selected biological environment the chimeric polypeptides activate their cognate receptors, often with the same or higher potency as the corresponding naturally occurring cytokine. As described herein, this is typically achieved using a cytokine blocking moiety that blocks or inhibits the receptor activating

function of the cytokine, active fragment or mutein thereof under general conditions but not under selected conditions, such as those present at the desired site of cytokine activity (e.g., an inflammatory site or a tumor).

[127] The chimeric polypeptides and nucleic acids encoding the chimeric polypeptides can be made using any suitable method. For example, nucleic acids encoding a chimeric polypeptide can be made using recombinant DNA techniques, synthetic chemistry or combinations of these techniques, and expressed in a suitable expression system, such as in CHO cells. Chimeric polypeptides can similarly be made, for example by expression of a suitable nucleic acid, using synthetic or semi-synthetic chemical techniques, and the like. In some embodiments, the blocking moiety can be attached to the cytokine polypeptide via sortase-mediated conjugation. "Sortases" are transpeptidases that modify proteins by recognizing and cleaving a carboxyl-terminal sorting signal embedded in or terminally attached to a target protein or peptide. Sortase A catalyzes the cleavage of the LPXTG motif (SEQ ID No.: 442) (where X is any standard amino acid) between the Thr and Gly residue on the target protein, with transient attachment of the Thr residue to the active site Cys residue on the enzyme, forming an enzyme-thioacyl intermediate. To complete transpeptidation and create the peptide-monomer conjugate, a biomolecule with an N-terminal nucleophilic group, typically an oligoglycine motif, attacks the intermediate, displacing Sortase A and joining the two molecules.

[128] To form the cytokine-blocking moiety fusion protein, the cytokine polypeptide is first tagged at the N-terminus with a polyglycine sequence, or alternatively, with at the C-terminus with a LPXTG motif (SEQ ID NO.: 442). The blocking moiety or other element has respective peptides attached that serve as acceptor sites for the tagged polypeptides. For conjugation to domains carrying a LPXTG (SEQ ID NO.: 442) acceptor peptide attached via its N-terminus, the polypeptide will be tagged with an N-terminal poly-glycine stretch. For conjugation to domain carrying a poly-glycine peptide attached via its C-terminus, the polypeptide will be tagged at its C-terminus with a LPXTG (SEQ ID NO.: 442) sortase recognition sequence. Recognizing poly-glycine and LPXTG (SEQ ID NO.: 442) sequences, sortase will form a peptide bond between polymer-peptide and tagged polypeptides. The sortase reaction cleaves off glycine residues as intermediates and occurs at room temperature.

[129] A variety of mechanisms can be exploited to remove or reduce the inhibition caused by the blocking moiety. For example, the pharmaceutical compositions can include a cytokine moiety and a blocking moiety, e.g. a steric blocking moiety, with a protease cleavable linker comprising a protease cleavage site located between the cytokine and cytokine blocking moiety or within the cytokine blocking moiety. When the protease cleavage site is cleaved, the blocking moiety can dissociate from cytokine, and the cytokine can then activate cytokine receptor. A cytokine moiety can also be blocked by a specific blocking moiety, such as an antibody, which binds an epitope found on the relevant cytokine.

[130] Any suitable linker can be used. For example, the linker can comprise glycine-glycine, a

sortase-recognition motif, or a sortase-recognition motif and a peptide sequence $(Gly_4Ser)_n$ (SEQ ID NO.: 443) or $(Gly_3Ser)_n$, (SEQ ID NO.: 444) wherein n is 1, 2, 3, 4 or 5. Typically, the sortase-recognition motif comprises a peptide sequence LPXTG (SEQ ID NO.: 442), where X is any amino acid. In some embodiments, the covalent linkage is between a reactive lysine residue attached to the C-terminal of the cytokine polypeptide and a reactive aspartic acid attached to the N-terminal of the blocker or other domain. In other embodiments, the covalent linkage is between a reactive aspartic acid residue attached to the N-terminal of the cytokine polypeptide and a reactive lysine residue attached to the C-terminal of said blocker or other domain.

[131] Accordingly, as described in detail herein, the cytokine blocking moieties used can be steric blockers. As used herein, a "steric blocker" refers to a polypeptide or polypeptide moiety that can be covalently bonded to a cytokine polypeptide directly or indirectly through other moieties such as linkers, for example in the form of a chimeric polypeptide (fusion protein), but otherwise does not covalently bond to the cytokine polypeptide. A steric blocker can non-covalently bond to the cytokine polypeptide, for example though electrostatic, hydrophobic, ionic or hydrogen bonding. A steric blocker typically inhibits or blocks the activity of the cytokine moiety due to its proximity to the cytokine moiety and comparative size. The steric inhibition of the cytokine moiety can be removed by spatially separating the cytokine moiety from the steric blocker, such as by enzymatically cleaving a fusion protein that contains a steric blocker and a cytokine polypeptide at a site between the steric blocker and the cytokine polypeptide.

[132] As described in greater detail herein, the blocking function can be combined with or due to the presence of additional functional components in the pharmaceutical composition, such as a targeting domain, a serum half-life extension element, and protease-cleavable linking polypeptides. For example, a serum half-life extending polypeptide can also be a steric blocker.

[133] In the interest of presenting a concise disclosure of the full scope of the invention, aspects of the invention are described in detail using the cytokine IL-2 as an exemplary cytokine. However, the invention and this disclosure are not limited to IL-2. It will be clear to a person of skill in the art that this disclosure, including the disclosed methods, polypeptides and nucleic acids, adequately describes and enables the use of other cytokines, fragments, variants, cytokine subunits, and muteins, such as IL-2, IL-7, IL-12, IL-15, IL-18, IL-21 IL-23, IFNalpha, IFNbeta, IFNgamma, TNFalpha, lymphotoxin, TGF-beta1, TGFbeta2, TGFbeta3, GM-CSF, CXCL10, CCL19, CCL20, CCL21 and functional fragments or muteins of any of the foregoing. Preferred cytokines for use in the fusion proteins disclosed herein are IL-2, IL-12, IFNalpha, IFNbeta, IFNgamma, muteins, functional variants, and functional fragments, or subunits of any of the foregoing. For example, the cytokine a IL-12 cytokine may be a p35 subunit, a p40 subunit, a heterodimer.

[134] Various elements ensure the delivery and activity of IL-2 preferentially at the site of desired IL-2 activity and to severely limit systemic exposure to the interleukin via a blocking and/or a

targeting strategy preferentially linked to a serum half-life extension strategy. In this serum half-life extension strategy, the blocked version of interleukin circulates for extended times (preferentially 1-2 or more weeks) but the activated version has the typical serum half-life of the interleukin.

[135] By comparison to a serum half-life extended version, the serum half-life of IL-2 administered intravenously is only ~10 minutes due to distribution into the total body extracellular space, which is large, ~15 L in an average sized adult. Subsequently, IL-2 is metabolized by the kidneys with a half-life of ~2.5 hours. (Smith, K. "Interleukin 2 immunotherapy." *Therapeutic Immunology* 240 (2001)). By other measurements, IL-2 has a very short plasma half-life of 85 minutes for intravenous administration and 3.3 hours subcutaneous administration (Kirchner, G. I., et al., 1998, Br J Clin Pharmacol. 46:5-10). In some embodiments of this invention, the half-life extension element is linked to the interleukin via a linker which is cleaved at the site of action (e.g. by inflammation-specific or tumor-specific proteases) releasing the interleukin's full activity at the desired site and also separating it from the half-life extension of the uncleaved version. In such embodiments, the fully active and free interleukin would have very different pharmacokinetic (pK) properties – a half-life of hours instead of weeks. In addition, exposure to active cytokine is limited to the site of desired cytokine activity (e.g., an inflammatory site or tumor) and systemic exposure to active cytokine, and associated toxicity and side effects, are reduced.

[136] Other cytokines envisioned in this invention have similar pharmacology (e.g. IL-15 as reported by Blood 2011 117:4787-4795; doi: doi.org/10.1182/blood-2010-10-311456) as IL-2 and accordingly, the designs of this invention address the shortcomings of using these agents directly, and provide chimeric polypeptides that can have extended half-life and/or be targeted to a site of desired activity (e.g., a site of inflammation or a tumor).

[137] If desired, IL-2 can be engineered to bind the IL-2R complex generally or one of the three IL-2R subunits specifically with an affinity that differs from that of the corresponding wild-type IL-2, for example toto selectively activate Tregs or Teff. For example, IL-2 polypeptides that are said to have higher affinity for the trimeric form of the IL-2 receptor relative to the dimeric beta/gamma form of the Il-2 receptor in comparison to wild type IL-2 can have an amino acid sequence that includes one of the following sets of mutations with respect to SEQ ID NO:1 (a mature IL-2 protein comprising amino acids 21–153 of human IL-2 having the Uniprot Accession No. P60568-1): (a) K64R, V69A, and Q74P; (b) V69A, Q74P, and T101A; (c) V69A, Q74P, and I128T; (d) N30D, V69A, Q74P, and F103S; (e) K49E, V69A, A73V, and K76E; (f) V69A, Q74P, T101A, and T133N; (g) N30S, V69A, Q74P, and I128A; (h) V69A, Q74P, N88D, and S99P; (i) N30S, V69A, Q74P, and I128T; (j) K9T, Q11R, K35R, V69A, and Q74P; (k) A1T, M46L, K49R, E61D, V69A, and H79R; (l) K48E, E68D, N71T, N90H, F103S, and I114V; (m) S4P, T10A, Q11R, V69A, Q74P, N88D, and T133A; (n) E15K, N30S Y31H, K35R, K48E, V69A, Q74P, and I92T; (o) N30S, E68D, V69A, N71A, Q74P, S75P, K76R, and N90H; (p) N30S, Y31C, T37A, V69A, A73V, Q74P, H79R, and I128T; (q) N26D, N29S,

N30S, K54R, E67G, V69A, Q74P, and I92T; (r) K8R, Q13R, N26D, N30T, K35R, T37R, V69A, Q74P, and I92T; and (s) N29S, Y31H, K35R, T37A, K48E, V69A, N71R, Q74P, N88D, and I89V. This approach can also be applied to prepare muteins of other cytokines including interleukins (e.g., IL-2, IL-7, IL-12, IL-15, IL-18, IL-23), interferons (IFNs, including IFNalpha, IFNbeta and IFNgamma), tumor necrosis factors (e.g., TNFalpha, lymphotoxin), transforming growth factors (e.g., TGFbeta1, TGFbeta2, TGFbeta3) and granulocyte macrophage-colony stimulating factor (GM-CS). For example, muteins can be prepared that have desired binding affinity for a cognate receptor.

[138] As noted above, any of the mutant IL-2 polypeptides disclosed herein can include the sequences described; they can also be limited to the sequences described and otherwise identical to SEQ ID NO:1. Moreover, any of the mutant IL-2 polypeptides disclosed herein can optionally include a substitution of the cysteine residue at position 125 with another residue (e.g., serine) and/or can optionally include a deletion of the alanine residue at position 1 of SEQ ID NO:1.

[139] Another approach to improving the therapeutic index of an IL-2 based therapy is to optimize the pharmacokinetics of the molecule to maximally activate Treg cells. Early studies of IL-2 action demonstrated that IL-2 stimulation of human T cell proliferation *in vitro* required a minimum of 5-6 hours exposure to effective concentrations of IL-2 (Cantrell, D. A., et. al., 1984, Science, 224: 1312-1316). When administered to human patients, IL-2 has a very short plasma half-life of 85 minutes for intravenous administration and 3.3 hours subcutaneous administration (Kirchner, G. I., et al., 1998, Br J Clin Pharmacol. 46:5-10). Because of its short half-life, maintaining circulating IL-2 at or above the level necessary to stimulate T cell proliferation for the necessary duration necessitates high doses that result in peak IL-2 levels significantly above the EC50 for Treg cells or will require frequent administration. These high IL-2 peak levels can activate IL2Rβγ receptors and have other unintended or adverse effects, for example VLS as noted above. An IL-2 analog, or a multifunctional protein with IL-2 attached to a domain that enables binding to the FcRn receptor, with a longer circulating half-life than IL-2 can achieve a target drug concentration for a specified period of time at a lower dose than IL-2, and with lower peak levels. Such an IL-2 analog will therefore require either lower doses or less frequent administration than IL-2 to effectively stimulate Treg cells. Less frequent subcutaneous administration of an IL-2 drug will also be more tolerable for patients. A therapeutic with these characteristics will translate clinically into improved pharmacological efficacy, reduced toxicity, and improved patient compliance with therapy. Alternatively, IL-2 or muteins of IL-2 (herein, "IL-2*") can be selectively targeted to the intended site of action (e.g. sites of inflammation or a tumor). This targeting can be achieved by one of several strategies, including the addition of domains to the administered agent that comprise blockers of the IL-2 (or muteins) that are cleaved away or by targeting domains or a combination of the two.

[140] In some embodiments, IL-2* partial agonists can be tailored to bind with higher or lower affinity depending on the desired target; for example, an IL-2* can be engineered to bind with

enhanced affinity to one of the receptor subunits and not the others. These types of partial agonists, unlike full agonists or complete antagonists, offer the ability to tune the signaling properties to an amplitude that elicits desired functional properties while not meeting thresholds for undesired properties. Given the differential activities of the partial agonists, a repertoire of IL-2 variants could be engineered to exhibit an even finer degree of distinctive signaling activities, ranging from almost full to partial agonism to complete antagonism.

[141] In some embodiments, the IL-2* has altered affinity for IL-2Rα. In some embodiments, the IL-2* has a higher affinity for IL-2Rα than wild-type IL-2. In other embodiments, the IL-2* has altered affinity for IL-2Rβ. In one embodiment, IL-2* has enhanced binding affinity for IL-2Rβ, e.g., the N-terminus of IL-2Rβ, that eliminates the functional requirement for IL-2Rα. In another embodiment, an IL-2* is generated that has increased binding affinity for IL-2Rβ but that exhibited decreased binding to IL-2Rγ, and thereby is defective IL-2Rβγ heterodimerization and signaling.

[142] Blocking moieties, described in further detail below, can also be used to favor binding to or activation of one or more receptors. In one embodiment, blocking moieties are added such that IL-2Rβγ binding or activation is blocked but IL-2Rα binding or activation is not changed. In another embodiment, blocking moieties are added such that IL-2Rα binding or activation is diminished. In another embodiment, blocking moieties are added such that binding to and or activation of all three receptors is inhibited. This blocking may be relievable by removal of the blocking moieties in a particular environment, for example by proteolytic cleavage of a linker linking one or more blocking moieties to the cytokine.

[143] A similar approach can be applied to improve other cytokines, particularly for use as immunostimulatory agents, for example for treating cancer. For example, in this aspect, the pharmacokinetics and/or pharmacodynamics of the cytokine (e.g., IL-2, IL-7, IL-12, IL-15, IL-18, IL-21 IL-23, IFNalpha, IFNbeta and IFNgamma, TNFalpha, lymphotoxin, TGFbeta1, TGFbeta2, TGFbeta3 GM-CSF, CXCL10, CCL19, CCL20, and CCL21 can be tailored to maximally activate effector cells (e.g., effect T cells, NK cells) and/or cytotoxic immune response promoting cells (e.g., induce dendritic cell maturation) at a site of desired activity, such as in a tumor, but preferably not systemically.

[144] Thus, provided herein are pharmaceutical compositions comprising at least one cytokine polypeptide, such as interleukins (e.g., IL-2, IL-7, IL-12, IL-15, IL-18, IL-21, IL-23), interferons (IFNs, including IFNalpha, IFNbeta and IFNgamma), tumor necrosis factors (e.g., TNFalpha, lymphotoxin), transforming growth factors (e.g., TGFbeta1, TGFbeta2, TGFbeta3), chemokines (e.g. CXCL10, CCL19, CCL20, CCL21) and granulocyte macrophage-colony stimulating factor (GM-CS) or a functional fragment or mutein of any of the foregoing. The polypeptide typically also includes at least one linker amino acid sequence, wherein the amino acid sequence is in certain embodiments capable of being cleaved by an endogenous protease. In one embodiment, the linker comprises an

amino acid sequence comprising HSSKLQ (SEQ ID NO.: 25), GPLGVRG (SEQ ID NO.: 445), IPVSLRSG (SEQ ID NO.: 446), VPLSLYSG (SEQ ID NO. 447), or SGESPAYYTA (SEQ ID NO. 448). In other embodiments, the chimeric polypeptide further contains a blocking moiety, e.g. a steric blocking polypeptide moiety, capable of blocking the activity of the interleukin polypeptide. The blocking moiety, for example, can comprise a human serum albumin (HSA) binding domain or an optionally branched or multi-armed polyethylene glycol (PEG). Alternatively, the pharmaceutical composition comprises a first cytokine polypeptide or a fragment thereof, and blocking moiety, e.g. a steric blocking polypeptide moiety, wherein the blocking moiety blocks the activity of the cytokine polypeptide on the cytokine receptor, and wherein the blocking moiety in certain embodiments comprises a protease cleavable domain. In some embodiments, blockade and reduction of cytokine activity is achieved simply by attaching additional domains with very short linkers to the N or C terminus of the interleukin domain. In such embodiments, it is anticipated the blockade is relieved by protease digestion of the blocking moiety or of the short linker that tethers the blocker to the interleukin. Once the domain is clipped or is released, it will no longer be able to achieve blockade of cytokine activity.

[145] The pharmaceutical composition e.g., chimeric polypeptide can comprise two or more cytokines, which can be the same cytokine polypeptide or different cytokine polypeptides. For example, the two or more different types of cytokines have complementary functions. In some examples, a first cytokine is IL-2 and a second cytokine is IL-12. In some embodiments, each of the two or more different types of cytokine polypeptides have activities that modulate the activity of the other cytokine polypeptides. In some examples of chimeric polypeptides that contain two cytokine polypeptides, a first cytokine polypeptide is T-cell activating, and a second cytokine polypeptide is non-T-cell-activating. In some examples of chimeric polypeptides that contain two cytokine polypeptides, a first cytokine is a chemoattractant, e.g. CXCL10, and a second cytokine is an immune cell activator.

[146] Preferably, the cytokine polypeptides (including functional fragments) that are included in the fusion proteins disclosed herein are not mutated or engineered to alter the properties of the naturally occurring cytokine, including receptor binding affinity and specificity or serum half-life. However, changes in amino acid sequence from naturally occurring (including wild type) cytokine are acceptable to facilitate cloning and to achieve desired expression levels, for example.

Blocking Moiety

[147] The blocking moiety can be any moiety that inhibits the ability of the cytokine to bind and/or activate its receptor. The blocking moiety can inhibit the ability of the cytokine to bind and/or activate its receptor sterically blocking and/or by noncovalently binding to the cytokine. Examples of suitable blocking moieties include the full length or a cytokine-binding fragment or mutein of the cognate receptor of the cytokine. Antibodies and fragments thereof including, a polyclonal antibody,

a recombinant antibody, a human antibody, a humanized antibody a single chain variable fragment (scFv), single-domain antibody such as a heavy chain variable domain (VH), a light chain variable domain (VL) and a variable domain of camelid-type nanobody (VHH), a dAb and the like that bind the cytokine can also be used. Other suitable antigen-binding domain that bind the cytokine can also be used, include non-immunoglobulin proteins that mimic antibody binding and/or structure such as, anticalins, affilins, affibody molecules, affimers, affitins, alphabodies, avimers, DARPins, fynomers, kunitz domain peptides, monobodies, and binding domains based on other engineered scaffolds such as SpA, GroEL, fibronectin, lipocallin and CTLA4 scaffolds. Further examples of suitable blocking polypeptides include polypeptides that sterically inhibit or block binding of the cytokine to its cognate receptor. Advantageously, such moieties can also function as half-life extending elements. For example, a peptide that is modified by conjugation to a water-soluble polymer, such as PEG, can sterically inhibit or prevent binding of the cytokine to its receptor. Polypeptides, or fragments thereof, that have long serum half-lives can also be used, such as serum albumin (human serum albumin), immunoglobulin Fc, transferrin and the like, as well as fragments and muteins of such polypeptides. Antibodies and antigen-binding domains that bind to, for example, a protein with a long serum half-life such as HSA, immunoglobulin or transferrin, or to a receptor that is recycled to the plasma membrane, such as FcRn or transferrin receptor, can also inhibit the cytokine, particularly when bound to their antigen. Examples of such antigen-binding polypeptides include a single chain variable fragment (scFv), single-domain antibody such as a heavy chain variable domain (VH), a light chain variable domain (VL) and a variable domain of camelid-type nanobody (VHH), a dAb and the like. Other suitable antigen-binding domain that bind the cytokine can also be used, include non-immunoglobulin proteins that mimic antibody binding and/or structure such as, anticalins, affilins, affibody molecules, affimers, affitins, alphabodies, avimers, DARPins, fynomers, kunitz domain peptides, monobodies, and binding domains based on other engineered scaffolds such as SpA, GroEL, fibronectin, lipocallin and CTLA4 scaffolds.

[148] In illustrative examples, when IL-2 is the cytokine in the chimeric polypeptide, the blocking moiety can be the full length or fragment or mutein of the alpha chain of IL-2 receptor (IL-2Rα) or beta (IL-2Rβ) or gamma chain of IL-2 receptor (IL-2Rγ), an anti-IL-2 single-domain antibody (dAb) or scFv, a Fab, an anti-CD25 antibody or fragment thereof, and anti-HSA dAb or scFv, and the like. As described further herein, when an antibody fragement is used to attenuate the activity of the cytokine polypeptide, the blocking moiety in the fusion protein can be a single chain antibody binding fragment, such as an scFv. The blocking moiety can also be half of a two chain antigen binding fragment such as a VH-CH1, which associates with a complementary VL-CL on a second polypeptide for form an antibody binding site the binds the cytokine polypeptide.

In vivo Half-life Extension Elements

[149] Preferably, the chimeric polypeptides comprise an in vivo half-life extension element.

Increasing the in vivo half-life of therapeutic molecules with naturally short half-lives allows for a more acceptable and manageable dosing regimen without sacrificing effectiveness. As used herein, a "half-life extension element" is a part of the chimeric polypeptide that increases the in vivo half-life and improve pK, for example, by altering its size (e.g., to be above the kidney filtration cutoff), shape, hydrodynamic radius, charge, or parameters of absorption, biodistribution, metabolism, and elimination. An exemplary way to improve the pK of a polypeptide is by expression of an element in the polypeptide chain that binds to receptors that are recycled to the plasma membrane of cells rather than degraded in the lysosomes, such as the FcRn receptor on endothelial cells and transferrin receptor. Three types of proteins, e.g., human IgGs, HSA (or fragments), and transferrin, persist for much longer in human serum than would be predicted just by their size, which is a function of their ability to bind to receptors that are recycled rather than degraded in the lysosome. These proteins, or fragments of them that retain the FcRn binding are routinely linked to other polypeptides to extend their serum half-life. In one embodiment, the half-life extension element is a human serum albumin (HSA) binding domain. HSA (SEQ ID NO: 2) may also be directly bound to the pharmaceutical compositions or bound via a short linker. Fragments of HSA may also be used. HSA and fragments thereof can function as both a blocking moiety and a half-life extension element. Human IgGs and Fc fragments can also carry out a similar function.

[150] The serum half-life extension element can also be antigen-binding polypeptide that binds to a protein with a long serum half-life such as serum albumin, transferrin and the like. Examples of such polypeptides include antibodies and fragments thereof including, a polyclonal antibody, a recombinant antibody, a human antibody, a humanized antibody a single chain variable fragment (scFv), single-domain antibody such as a heavy chain variable domain (VH), a light chain variable domain (VL) and a variable domain of camelid-type nanobody (VHH), a dAb and the like. Other suitable antigen-binding domain include non-immunoglobulin proteins that mimic antibody binding and/or structure such as, anticalins, affilins, affibody molecules, affimers, affitins, alphabodies, avimers, DARPins, fynomers, kunitz domain peptides, monobodies, and binding domains based on other engineered scaffolds such as SpA, GroEL, fibronectin, lipocallin and CTLA4 scaffolds. Further examples of antigen-binding polypeptides include a ligand for a desired receptor, a ligand-binding portion of a receptor, a lectin, and peptides that binds to or associates with one or more target antigens.

[151] Some preferred serum half-life extension elements are polypeptides that comprise complementarity determining regions (CDRs), and optionally non-CDR loops. Advantageously, such serum half-life extension elements can extend the serum half-life of the cytokine, and also function as inhibitors of the cytokine (e.g., via steric blocking, non-covalent interaction or combination thereof) and/or as targeting domains. In some instances, the serum half-life extension elements are domains derived from an immunoglobulin molecule (Ig molecule) or engineered protein scaffolds that mimic antibody structure and/or

binding activity. The Ig may be of any class or subclass (IgG1, IgG2, IgG3, IgG4, IgA, IgE, IgM etc). A polypeptide chain of an Ig molecule folds into a series of parallel beta strands linked by loops. In the variable region, three of the loops constitute the "complementarity determining regions" (CDRs) which determine the antigen binding specificity of the molecule. An IgG molecule comprises at least two heavy (H) chains and two light (L) chains inter-connected by disulfide bonds, or an antigen binding fragment thereof. Each heavy chain is comprised of a heavy chain variable region (abbreviated herein as VH) and a heavy chain constant region. The heavy chain constant region is comprised of three domains, CH1, CH2 and CH3. Each light chain is comprised of a light chain variable region (abbreviated herein as VL) and a light chain constant region. 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 (CDRs) with are hypervariable in sequence and/or involved in antigen recognition and/or usually form structurally defined loops, interspersed with regions that are more conserved, termed framework regions (FR). Each VH and VL is composed of three CDRs and four FRs, arranged from amino-terminus to carboxy-terminus in the following order: FR1, CDR1, FR2, CDR2, FR3, CDR3, FR4. In some embodiments of this disclosure, at least some or all of the amino acid sequences of FR1, FR2, FR3, and FR4 are part of the "non-CDR loop" of the binding moieties described herein. A variable domain of an immunoglobulin molecule has several beta strands that are arranged in two sheets. The variable domains of both light and heavy immunoglobulin chains contain three hypervariable loops, or complementarity-determining regions (CDRs). The three CDRs of a V domain (CDR1, CDR2, CDR3) cluster at one end of the beta barrel. The CDRs are the loops that connect beta strands B-C, C'-C", and F-G of the immunoglobulin fold, whereas the bottom loops that connect beta strands AB, CC', C" -D and E-F of the immunoglobulin fold, and the top loop that connects the D-E strands of the immunoglobulin fold are the non-CDR loops. In some embodiments of this disclosure, at least some amino acid residues of a constant domain, CH1, CH2, or CH3, are part of the "non-CDR loop" of the binding moieties described herein. Non-CDR loops comprise, in some embodiments, one or more of AB, CD, EF, and DE loops of a C1-set domain of an Ig or an Ig-like molecule; AB, CC', EF, FG, BC, and EC' loops of a C2-set domain of an Ig or an Ig-like molecule; DE, BD, GF, A(A1A2)B, and EF loops of I(Intermediate)-set domain of an Ig or Ig-like molecule.

[152] Within the variable domain, the CDRs are believed to be responsible for antigen recognition and binding, while the FR residues are considered a scaffold for the CDRs. However, in certain cases, some of the FR residues play an important role in antigen recognition and binding. Framework region residues that affect Ag binding are divided into two categories. The first are FR residues that contact the antigen, thus are part of the binding-site, and some of these residues are close in sequence to the CDRs. Other residues are those that are far from the CDRs in sequence, but are in close proximity to it in the 3-D structure of the molecule, *e.g.*, a loop in heavy chain.

[153] The binding moieties are any kinds of polypeptides. For example, in certain instances the binding moieties are natural peptides, synthetic peptides, or fibronectin scaffolds, or engineered bulk serum proteins.

The bulk serum protein comprises, for example, albumin, fibrinogen, or a globulin. In some embodiments, the binding moieties are engineered scaffolds. Engineered scaffolds comprise, for example, sdAb, a scFv, a Fab, a VHH, a fibronectin type III domain, immunoglobulin-like scaffold (as suggested in Halaby et al., 1999. Prot Eng 12(7):563-571), DARPin, cystine knot peptide, lipocalin, three-helix bundle scaffold, protein G-related albumin-binding module, or a DNA or RNA aptamer scaffold.

[154] In some cases, the serum half-life extending element comprises a binding site for a bulk serum protein. In some embodiments, the CDRs provide the binding site for the bulk serum protein. The bulk serum protein is, in some examples, a globulin, albumin, transferrin, IgG1, IgG2, IgG4, IgG3, IgA monomer, Factor XIII, Fibrinogen, IgE, or pentameric IgM. In some embodiments, the CDR form a binding site for an immunoglobulin light chain, such as an Igκ free light chain or an Igλ free light chain.

[155] The serum half-life extension element can be any type of binding domain, including but not limited to, domains from a monoclonal antibody, a polyclonal antibody, a recombinant antibody, a human antibody, a humanized antibody. In some embodiments, the binding moiety is a single chain variable fragment (scFv), single-domain antibody such as a heavy chain variable domain (VH), a light chain variable domain (VL) and a variable domain (VHH) of camelid derived nanobody. In other embodiments, the binding moieties are non-Ig binding domains, i.e., antibody mimetic, such as anticalins, affilins, affibody molecules, affimers, affitins, alphabodies, avimers, DARPins, fynomers, kunitz domain peptides, and monobodies.

[156] In other embodiments, the serum half-life extension element can be a water-soluble polymer or a peptide that is conjugated to a water-soluble polymer, such as PEG. "PEG," "polyethylene glycol" and "poly(ethylene glycol)" as used herein, are interchangeable and encompass any nonpeptidic water-soluble poly(ethylene oxide). The term "PEG" also means a polymer that contains a majority, that is to say, greater than 50%, of —OCH_2CH_2— repeating subunits. With respect to specific forms, the PEG can take any number of a variety of molecular weights, as well as structures or geometries such as "branched," "linear," "forked," "multifunctional," and the like, to be described in greater detail below. The PEG is not limited to a particular structure and can be linear (e.g., an end capped, e.g., alkoxy PEG or a bifunctional PEG), branched or multi-armed (e.g., forked PEG or PEG attached to a polyol core), a dendritic (or star) architecture, each with or without one or more degradable linkages. Moreover, the internal structure of the PEG can be organized in any number of different repeat patterns and can be selected from the group consisting of homopolymer, alternating copolymer, random copolymer, block copolymer, alternating tripolymer, random tripolymer, and block tripolymer. PEGs can be conjugated to polypeptide and peptides through any suitable method. Typically, a reactive PEG derivative, such as N-hydroxysuccinamidyl ester PEG, is reacted with a peptide or polypeptide that includes amino acids with a side chain that contains an amine, sulfhydryl, carboxylic acid or hydroxyl functional group, such as cysteine, lysine, asparagine, glutamine, theonine, tyrosine, serine, aspartic acid, and glutamic acid.

Targeting and Retention Domains

[157] For certain applications, it may be desirable to maximize the amount of time the construct is present in its desired location in the body. This can be achieved by including one further domain in the chimeric polypeptide (fusion protein) to influence its movements within the body. For example, the chimeric nucleic acids can encode a domain that directs the polypeptide to a location in the body, e.g., tumor cells or a site of inflammation; this domain is termed a "targeting domain" and/or encode a domain that retains the polypeptide in a location in the body, e.g., tumor cells or a site of inflammation; this domain is termed a "retention domain". In some embodiments a domain can function as both a targeting and a retention domain. In some embodiments, the targeting domain and/or retention domain are specific to a protease-rich environment. In some embodiments, the encoded targeting domain and/or retention domain are specific for regulatory T cells (Tregs), for example targeting the CCR4 or CD39 receptors. Other suitable targeting and/or retention domains comprise those that have a cognate ligand that is overexpressed in inflamed tissues, e.g., the IL-1 receptor, or the IL-6 receptor. In other embodiments, the suitable targeting and/or retention domains comprise those who have a cognate ligand that is overexpressed in tumor tissue, e.g., Epcam, CEA or mesothelin. In some embodiments, the targeting domain is linked to the interleukin via a linker which is cleaved at the site of action (e.g. by inflammation or cancer specific proteases) releasing the interleukin full activity at the desired site. In some embodiments, the targeting and/or retention domain is linked to the interleukin via a linker which is not cleaved at the site of action (e.g. by inflammation or cancer specific proteases), causing the cytokine to remain at the desired site.

[158] Antigens of choice, in some cases, are expressed on the surface of a diseased cell or tissue, for example a tumor or a cancer cell. Antigens useful for tumor targeting and retention include but are not limited to EpCAM, EGFR, HER-2, HER-3, c-Met, FOLR1, and CEA. Pharmaceutical compositions disclosed herein, also include proteins comprising two targeting and/or retention domains that bind to two different target antigens known to be expressed on a diseased cell or tissue. Exemplary pairs of antigen binding domains include but are not limited to EGFR/CEA, EpCAM/CEA, and HER-2/HER-3.

[159] Suitable targeting and/or retention domains include antigen-binding domains, such as antibodies and fragments thereof including, a polyclonal antibody, a recombinant antibody, a human antibody, a humanized antibody a single chain variable fragment (scFv), single-domain antibody such as a heavy chain variable domain (VH), a light chain variable domain (VL) and a variable domain of camelid-type nanobody (VHH), a dAb and the like. Other suitable antigen-binding domain include non-immunoglobulin proteins that mimic antibody binding and/or structure such as, anticalins, affilins, affibody molecules, affimers, affitins, alphabodies, avimers, DARPins, fynomers, kunitz domain peptides, monobodies, and binding domains based on other engineered scaffolds such as SpA, GroEL, fibronectin, lipocallin and CTLA4 scaffolds. Further examples of antigen-binding polypeptides include a ligand for a desired receptor, a ligand-binding portion of a receptor, a lectin,

and peptides that binds to or associates with one or more target antigens.

[160] In some embodiments, the targeting and/or retention domains specifically bind to a cell surface molecule. In some embodiments, the targeting and/or retention domains specifically bind to a tumor antigen. In some embodiments, the targeting polypeptides specifically and independently bind to a tumor antigen selected from at least one of Fibroblast activation protein alpha (FAPa), Trophoblast glycoprotein (5T4), Tumor-associated calcium signal transducer 2 (Trop2), Fibronectin EDB (EDB-FN), fibronectin EIIIB domain, CGS-2, EpCAM, EGFR, HER-2, HER-3, cMet, CEA, and FOLR1. In some embodiments, the targeting polypeptides specifically and independently bind to two different antigens, wherein at least one of the antigens is a tumor antigen selected from EpCAM, EGFR, HER-2, HER-3, cMet, CEA, and FOLR1.

[161] The targeting and/or retention antigen can be a tumor antigen expressed on a tumor cell. Tumor antigens are well known in the art and include, for example, EpCAM, EGFR, HER-2, HER-3, c-Met, FOLR1, PSMA, CD38, BCMA, and CEA. 5T4, AFP, B7-H3, Cadherin-6, CAIX, CD117, CD123, CD138, CD166, CD19, CD20, CD205, CD22, CD30, CD33, CD352, CD37, CD44, CD52, CD56, CD70, CD71, CD74, CD79b, DLL3, EphA2, FAP, FGFR2, FGFR3, GPC3, gpA33, FLT-3, gpNMB, HPV-16 E6, HPV-16 E7, ITGA2, ITGA3, SLC39A6, MAGE, mesothelin, Muc1, Muc16, NaPi2b, Nectin-4, P-cadherin, NY-ESO-1, PRLR, PSCA, PTK7, ROR1, SLC44A4, SLTRK5, SLTRK6, STEAP1, TIM1, Trop2, WT1.

[162] The targeting and/or retention antigen can be an immune checkpoint protein. Examples of immune checkpoint proteins include but are not limited to CD27, CD137, 2B4, TIGIT, CD155, ICOS, HVEM, CD40L, LIGHT, TIM-1, OX40, DNAM-1, PD-L1, PD1, PD-L2, CTLA-4, CD8, CD40, CEACAM1, CD48, CD70, A2AR, CD39, CD73, B7-H3, B7-H4, BTLA, IDO1, IDO2, TDO, KIR, LAG-3, TIM-3, or VISTA.

[163] The targeting and/or retention antigen can be a cell surface molecule such as a protein, lipid or polysaccharide. In some embodiments, a targeting and/or retention antigen is a on a tumor cell, virally infected cell, bacterially infected cell, damaged red blood cell, arterial plaque cell, inflamed or fibrotic tissue cell. The targeting and/or retention antigen can comprise an immune response modulator. Examples of immune response modulator include but are not limited to granulocyte-macrophage colony stimulating factor (GM-CSF), macrophage colony stimulating factor (M-CSF), granulocyte colony stimulating factor (G-CSF), interleukin 2 (IL-2), interleukin 3 (IL-3), interleukin 12 (IL-12), interleukin 15 (IL-15), B7-1 (CD80), B7-2 (CD86), GITRL, CD3, or GITR.

[164] The targeting and/or retention antigen can be a cytokine receptor. Examples, of cytokine receptors include but are not limited to Type I cytokine receptors, such as GM-CSF receptor, G-CSF receptor, Type I IL receptors, Epo receptor, LIF receptor, CNTF receptor, TPO receptor; Type II Cytokine receptors, such as IFN-alpha receptor (IFNAR1, IFNAR2), IFB-beta receptor, IFN-gamma receptor (IFNGR1, IFNGR2), Type II IL receptors; chemokine receptors, such as CC chemokine receptors, CXC chemokine receptors, CX3C chemokine receptors, XC chemokine receptors; tumor necrosis receptor superfamily receptors, such as TNFRSF5/CD40, TNFRSF8/CD30, TNFRSF7/CD27, TNFRSF1A/TNFR1/CD120a, TNFRSF1B / TNFR2 /

CD120b; TGF-beta receptors, such as TGF-beta receptor 1, TGF-beta receptor 2; Ig super family receptors, such as IL-1 receptors, CSF-1R, PDGFR (PDGFRA, PDGFRB), SCFR.

Linkers

[165] As stated above, the pharmaceutical compositions comprise one or more linker sequences. A linker sequence serves to provide flexibility between polypeptides, such that, for example, the blocking moiety is capable of inhibiting the activity of the cytokine polypeptide. The linker sequence can be located between any or all of the cytokine polypeptide, the serum half-life extension element, and/or the blocking moiety. As described herein at least one of the linkers is protease cleavable, and contains a (one or more) cleavage site for a (one or more) desired protease. Preferably, the desired protease is enriched or selectively expressed at the desired site of cytokine activity (e.g., the tumor microenvironment). Thus, the fusion protein is preferentially or selectively cleaved at the site of desired cytokine activity.

[166] Suitable linkers can be of different lengths, such as from 1 amino acid (e.g., Gly) to 20 amino acids, from 2 amino acids to 15 amino acids, from 3 amino acids to 12 amino acids, including 4 amino acids to 10 amino acids, amino acids to 9 amino acids, 6 amino acids to 8 amino acids, or 7 amino acids to 8 amino acids, and may be 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, or 60 amino acids.

[167] The orientation of the components of the pharmaceutical composition, are largely a matter of design choice and it is recognized that multiple orientations are possible and all are intended to be encompassed by this disclosure. For example, a blocking moiety can be located C-terminally or N-terminally to a cytokine polypeptide.

[168] Proteases known to be associated with diseased cells or tissues include but are not limited to serine proteases, cysteine proteases, aspartate proteases, threonine proteases, glutamic acid proteases, metalloproteases, asparagine peptide lyases, serum proteases, cathepsins, Cathepsin B, Cathepsin C, Cathepsin D, Cathepsin E, Cathepsin K, Cathepsin L, kallikreins, hKl, hK10, hK15, plasmin, collagenase, Type IV collagenase, stromelysin, Factor Xa, chymotrypsin-like protease, trypsin-like protease, elastase-like protease, subtilisin-like protease, actinidain, bromelain, calpain, caspases, caspase-3, Mirl-CP, papain, HIV-1 protease, HSV protease, CMV protease, chymosin, renin, pepsin, matriptase, legumain, plasmepsin, nepenthesin, metalloexopeptidases, metalloendopeptidases, matrix metalloproteases (MMP), MMP1, MMP2, MMP3, MMP8, MMP9, MMP13, MMP11, MMP14, urokinase plasminogen activator (uPA), enterokinase, prostate-specific antigen (PSA, hK3), interleukin-1β converting enzyme, thrombin, FAP (FAP-a), dipeptidyl peptidase, meprins, granzymes and dipeptidyl peptidase IV (DPPIV/CD26). Proteases capable of cleaving amino acid sequences encoded by the chimeric nucleic acid sequences provided herein can, for example, be selected from the group consisting of a prostate specific antigen (PSA), a matrix metalloproteinase (MMP), an A

Disintigrin and a Metalloproteinase (ADAM), a plasminogen activator, a cathepsin, a caspase, a tumor cell surface protease, and an elastase. The MMP can, for example, be matrix metalloproteinase 2 (MMP2) or matrix metalloproteinase 9 (MMP9).

[169] Proteases useful in the methods disclosed herein are presented in Table 1, and exemplary proteases and their cleavage site are presented in Table 1a:

Table 1. Proteases relevant to inflammation and cancer

Protease	Specificity	Other aspects
Secreted by killer T cells:		
Granzyme B (grB)	Cleaves after Asp residues (asp-ase)	Type of serine protease; strongly implicated in inducing perforin-dependent target cell apoptosis
Granzyme A (grA)	trypsin-like, cleaves after basic residues	Type of serine protease;
Granzyme H (grH)	Unknown substrate specificity	Type of serine protease; *Other granzymes are also secreted by killer T cells, but not all are present in humans*
Caspase-8	Cleaves after Asp residues	Type of cysteine protease; plays essential role in TCR-induced cellular expansion-exact molecular role unclear
Mucosa-associated lymphoid tissue (MALT1)	Cleaves after arginine residues	Type of cysteine protease; likely acts both as a scaffold and proteolytically active enzyme in the CBM-dependent signaling pathway
Tryptase	Targets: angiotensin I, fibrinogen, prourokinase, TGFβ; preferentially cleaves proteins after lysine or arginine residues	Type of mast cell-specific serine protease; trypsin-like; resistant to inhibition by macromolecular protease inhibitors expressed in mammals due to their tetrameric structure, with all sites facing narrow central pore; *also associated with inflammation*
Associated with inflammation:		
Thrombin	Targets: FGF-2, HB-EGF, Osteo-pontin, PDGF, VEGF	Type of serine protease; modulates activity of vascular growth factors, chemokines and extracellular proteins; strengthens VEGF-induced proliferation; induces cell migration; angiogenic factor; regulates hemostasis
Chymase	Exhibit chymotrypsin-like specificity, cleaving proteins after aromatic amino acid residues	Type of mast cell-specific serine protease
Carboxypeptidase A (MC-CPA)	Cleaves amino acid residues from C-terminal	Type of zinc-dependent metalloproteinase

	end of peptides and proteins	
Kallikreins	Targets: high molecular weight kininogen, pro-urokinase	Type of serine protease; modulate relaxation response; contribute to inflammatory response; fibrin degradation
Elastase	Targets: E-cadherin, GM-CSF, IL-1, IL-2, IL-6, IL8, $p38^{MAPK}$, TNFα, VE-cadherin	Type of neutrophil serine protease; degrades ECM components; regulates inflammatory response; activates pro-apoptotic signaling
Cathepsin G	Targets: EGF, ENA-78, IL-8, MCP-1, MMP-2, MT1-MMP, PAI-1, RANTES, TGFβ, TNFα	Type of serine protease; degrades ECM components; chemo-attractant of leukocytes; regulates inflammatory response; promotes apoptosis
PR-3	Targets: ENA-78, IL-8, IL-18, JNK, $p38^{MAPK}$, TNFα	Type of serine protease; promotes inflammatory response; activates pro-apoptotic signaling
Granzyme M (grM)	Cleaves after Met and other long, unbranched hydrophobic residues	Type of serine protease; only expressed in NK cells
Calpains	Cleave between Arg and Gly	Family of cysteine proteases; calcium-dependent; activation is involved in the process of numerous inflammation-associated diseases

Table 1a: Exemplary Proteases and Protease Recognition Sequences

Protease	Cleavage Domain Sequence	SEQ ID NO:
MMP7	KRALGLPG	3
MMP7	$(DE)_8RPLALWRS(DR)_8$	4
MMP9	PR(S/T)(L/I)(S/T)	5
MMP9	LEATA	6
MMP11	GGAANLVRGG	7

MMP14	SGRIGFLRTA	8
MMP	PLGLAG	9
MMP	PLGLAX	10
MMP	PLGC(me)AG	11
MMP	ESPAYYTA	12
MMP	RLQLKL	13
MMP	RLQLKAC	14
MMP2, MMP9, MMP14	EP(Cit)G(Hof)YL	15
Urokinase plasminogen activator (uPA)	SGRSA	16
Urokinase plasminogen activator (uPA)	DAFK	17
Urokinase plasminogen activator (uPA)	GGGRR	18
Lysosomal Enzyme	GFLG	19
Lysosomal Enzyme	ALAL	20
Lysosomal Enzyme	FK	21
Cathepsin B	NLL	22

Cathepsin D	PIC(Et)FF	23
Cathepsin K	GGPRGLPG	24
Prostate Specific Antigen	HSSKLQ	25
Prostate Specific Antigen	HSSKLQL	26
Prostate Specific Antigen	HSSKLQEDA	27
Herpes Simplex Virus Protease	LVLASSSFGY	28
HIV Protease	GVSQNYPIVG	29
CMV Protease	GVVQASCRLA	30
Thrombin	F(Pip)RS	31
Thrombin	DPRSFL	32
Thrombin	PPRSFL	33
Caspase-3	DEVD	34
Caspase-3	DEVDP	35
Caspase-3	KGSGDVEG	36
Interleukin 1β converting enzyme	GWEHDG	37

Enterokinase	**EDDDDKA**	**38**
FAP	**KQEQNPGST**	**39**
Kallikrein 2	**GKAFRR**	**40**
Plasmin	**DAFK**	**41**
Plasmin	**DVLK**	**42**
Plasmin	**DAFK**	**43**
TOP	**ALLLALL**	**44**

[170] Provided herein are pharmaceutical compositions comprising polypeptide sequences. As with all peptides, polypeptides, and proteins, including fragments thereof, it is understood that additional modifications in the amino acid sequence of the chimeric polypeptides (amino acid sequence variants) can occur that do not alter the nature or function of the peptides, polypeptides, or proteins. Such modifications include conservative amino acid substitutions and are discussed in greater detail below.

[171] The compositions provided herein have a desired function. The compositions are comprised of at least a cytokine polypeptide, such as IL-2, IL-7, IL-12, IL-15, IL-18, IL-21, IFNa, or IFNγ, or a chemokine, such as CXCL10, CCL19, CCL20, CCL21, a blocking moiety, e.g. a steric blocking polypeptide, and an optional serum half-life extension element, and an optional targeting polypeptide, with one or more linkers connecting each polypeptide in the composition. The first polypeptide, e.g., an IL-2 mutein, is provided to be an active agent. The blocking moiety is provided to block the activity of the interleukin. The linker polypeptide, e.g., a protease cleavable polypeptide, is provided to be cleaved by a protease that is specifically expressed at the intended target of the active agent. Optionally, the blocking moiety blocks the activity of the first polypeptide by binding the interleukin polypeptide. In some embodiments, the blocking moiety, e.g. a steric blocking peptide, is linked to the interleukin via a protease-cleavable linker which is cleaved at the site of action (e.g. by inflammation-specific or tumor-specific proteases) releasing the cytokine full activity at the desired site.

[172] The protease cleavage site may be a naturally occurring protease cleavage site or an

artificially engineered protease cleavage site. The artificially engineered protease cleavage site can be cleaved by more than one protease specific to the desired environment in which cleavage will occur, e.g. a tumor. The protease cleavage site may be cleavable by at least one protease, at least two proteases, at least three proteases, or at least four proteases.

[173] In some embodiments, the linker comprises glycine-glycine, a sortase-recognition motif, or a sortase-recognition motif and a peptide sequence $(Gly_4Ser)_n$ (SEQ ID NO.: 443) or $(Gly_3Ser)_n$, (SEQ ID NO.: 444), wherein n is 1, 2, 3, 4 or 5. In one embodiment, the sortase-recognition motif comprises a peptide sequence LPXTG (SEQ ID NO.: 442), where X is any amino acid. In one embodiment, the covalent linkage is between a reactive lysine residue attached to the C-terminal of the cytokine polypeptide and a reactive aspartic acid attached to the N-terminal of the blocking or other moiety. In one embodiment, the covalent linkage is between a reactive aspartic acid residue attached to the N-terminal of the cytokine polypeptide and a reactive lysine residue attached to the C-terminal of the blocking or other moiety.

Cleavage and Inducibility

[174] As described herein, the activity of the cytokine polypeptide the context of the fusion protein is attenuated, and protease cleavage at the desired site of activity, such as in a tumor microenvironment, releases a form of the cytokine from the fusion protein that is much more active as a cytokine receptor agonist than the fusion protein. For example, the cytokine-receptor activating (agonist) activity of the fusion polypeptide can be at least about 10X, at least about 50X, at least about 100X, at least about 250X, at least about 500X, or at least about 1000x less than the cytokine receptor activating activity of the cytokine polypeptide as a separate molecular entity. The cytokine polypeptide that is part of the fusion protein exists as a separate molecular entity when it contains an amino acid that is substantially identical to the cytokine polypeptide and does not substantially include additional amino acids and is not associated (by covalent or non-covalent bonds) with other molecules. If necessary, a cytokine polypeptide as a separate molecular entity may include some additional amino acid sequences, such as a tag or short sequence to aid in expression and/or purification.

[175] In other examples, the cytokine-receptor activating (agonist) activity of the fusion polypeptide is at least about 10X, at least about 50X, at least about 100X, at least about 250X, at least about 500X, or about 1000x less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker in the fusion protein. In other words, the cytokine receptor activating (agonist) activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker in the fusion protein is at least about 10X, at least about 50X, at least about 100X, at least about 250X, at least about 500X, or at least about 1000x greater than the cytokine receptor activating activity of the

fusion protein.

Polypeptide variants and amino acid substitutions

[176] The polypeptides described herein can include components (e.g., the cytokine, the blocking moiety) that have the same amino acid sequence of the corresponding naturally occurring protein (e.g., IL-2, IL-15, HSA) or can have an amino acid sequence that differs from the naturally occurring protein so long as the desired function is maintained. It is understood that one way to define any known modifications and derivatives or those that might arise, of the disclosed proteins and nucleic acids that encode them is through defining the sequence variants in terms of identity to specific known reference sequences. Specifically disclosed are polypeptides and nucleic acids which have at least, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99 percent identity to the chimeric polypeptides provided herein. For example, provided are polypeptides or nucleic acids that have at least, 70, 71, 72, 73, 74, 75, 76, 77, 78, 79, 80, 81, 82, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 97, 98, 99 percent identity to the sequence of any of the nucleic acids or polypeptides described herein. Those of skill in the art readily understand how to determine the identity of two polypeptides or two nucleic acids. For example, the identity can be calculated after aligning the two sequences so that the identity is at its highest level.

[177] Another way of calculating identity can be performed by published algorithms. Optimal alignment of sequences for comparison may be conducted by the local identity algorithm of Smith and Waterman Adv. Appl. Math. 2:482 (1981), by the identity alignment algorithm of Needleman and Wunsch, J. Mol. Biol. 48:443 (1970), by the search for similarity method of Pearson and Lipman, Proc. Natl. Acad. Sci. USA 85:2444 (1988), by computerized implementations of these algorithms (GAP, BESTFIT, FASTA, and TFASTA in the Wisconsin Genetics Software Package, Genetics Computer Group, 575 Science Dr., Madison, Wis.), or by inspection.

[178] The same types of identity can be obtained for nucleic acids by, for example, the algorithms disclosed in Zuker, Science 244:48-52 (1989); Jaeger et al., Proc. Natl. Acad. Sci. USA 86:7706-7710 (1989); Jaeger et al., Methods Enzymol. 183:281-306 (1989), which are herein incorporated by reference for at least material related to nucleic acid alignment. It is understood that any of the methods typically can be used and that in certain instances the results of these various methods may differ, but the skilled artisan understands if identity is found with at least one of these methods, the sequences would be said to have the stated identity, and be disclosed herein.

[179] Protein modifications include amino acid sequence modifications. Modifications in amino acid sequence may arise naturally as allelic variations (e.g., due to genetic polymorphism), may arise due to environmental influence (e.g., by exposure to ultraviolet light), or may be produced by human intervention (e.g., by mutagenesis of cloned DNA sequences), such as induced point, deletion, insertion and substitution mutants. These modifications can result in changes in the amino acid sequence, provide silent mutations, modify a restriction site, or provide other specific mutations.

Amino acid sequence modifications typically fall into one or more of three classes: substitutional, insertional or deletional modifications. Insertions include amino and/or carboxyl terminal fusions as well as intrasequence insertions of single or multiple amino acid residues. Insertions ordinarily will be smaller insertions than those of amino or carboxyl terminal fusions, for example, on the order of one to four residues. Deletions are characterized by the removal of one or more amino acid residues from the protein sequence. Typically, no more than about from 2 to 6 residues are deleted at any one site within the protein molecule. Amino acid substitutions are typically of single residues, but can occur at a number of different locations at once; insertions usually will be on the order of about from 1 to 10 amino acid residues; and deletions will range about from 1 to 30 residues. Deletions or insertions preferably are made in adjacent pairs, i.e. a deletion of 2 residues or insertion of 2 residues. Substitutions, deletions, insertions or any combination thereof may be combined to arrive at a final construct. The mutations must not place the sequence out of reading frame and preferably will not create complementary regions that could produce secondary mRNA structure. Substitutional modifications are those in which at least one residue has been removed and a different residue inserted in its place. Such substitutions generally are made in accordance with the following Table 2 and are referred to as conservative substitutions.

Table 2. Exemplary amino acid substitutions

Amino Acid	**Exemplary Substitutions**
Ala	Ser, Gly, Cys
Arg	Lys, Gln, Met, Ile
Asn	Gln, His, Glu, Asp
Asp	Glu, Asn, Gln
Cys	Ser, Met, Thr
Gln	Asn, Lys, Glu, Asp
Glu	Asp, Asn, Gln
Gly	Pro, Ala
His	Asn, Gln

Ile	Leu, Val, Met
Leu	Ile, Val, Met
Lys	Arg, Gln, Met, Ile
Met	Leu, Ile, Val
Phe	Met, Leu, Tyr, Trp, His
Ser	Thr, Met, Cys
Thr	Ser, Met, Val
Trp	Tyr, Phe
Tyr	Trp, Phe, His
Val	Ile, Leu, Met

[180] Modifications, including the specific amino acid substitutions, are made by known methods. For example, modifications are made by site specific mutagenesis of nucleotides in the DNA encoding the polypeptide, thereby producing DNA encoding the modification, and thereafter expressing the DNA in recombinant cell culture. Techniques for making substitution mutations at predetermined sites in DNA having a known sequence are well known, for example M13 primer mutagenesis and PCR mutagenesis.

[181] Modifications can be selected to optimize binding. For example, affinity maturation techniques can be used to alter binding of the scFv by introducing random mutations inside the complementarity determining regions (CDRs). Such random mutations can be introduced using a variety of techniques, including radiation, chemical mutagens or error-prone PCR. Multiple rounds of mutation and selection can be performed using, for example, phage display.

[182] The disclosure also relates to nucleic acids that encode the chimeric polypeptides described herein, and to the use of such nucleic acids to produce the chimeric polypeptides and for therapeutic purposes. For example, the invention includes DNA and RNA molecules (e.g., mRNA, self-replicating RNA) that encode a chimeric polypeptide and to the therapeutic use of such DNA and RNA molecules.

Exemplary Compositions

[183] Exemplary fusion proteins of the invention combine the above described elements in a variety of orientations. The orientations described in this section are meant as examples and are not to be

considered limiting.

[184] In some embodiments, the fusion protein comprises a cytokine, a blocking moiety and a half-life extension element. In some embodiments, the cytokine is positioned between the half-life extension element and the blocking moiety. In some embodiments, the cytokine is N-terminal to the blocking moiety and the half-life extension element. In some such embodiments, the cytokine is proximal to the blocking moiety; in some such embodiments, the cytokine is proximal to the half-life extension element. At least one protease-cleavable linker must be included in all embodiments, such that the cytokine may be active upon cleavage. In some embodiments, the cytokine is C-terminal to the blocking moiety and the half-life extension element. Additional elements may be attached to one another by a cleavable linker, a non-cleavable linker, or by direct fusion.

[185] In some embodiments, the blocking domains used are capable of extending half-life, and the cytokine is positioned between two such blocking domains. In some embodiments, the cytokine is positioned between two blocking domains, one of which is capable of extending half-life.

[186] In some embodiments, two cytokines are included in the same construct. In some embodiments, the cytokines are connected to two blocking domains each (three in total in one molecule), with a blocking domain between the two cytokine domains. In some embodiments, one or more additional half-life extension domains may be included to optimize pharmacokinetic properties. In some cases, it is beneficial to include two of the same cytokine to facilitate dimerization. An example of a cytokine that works as a dimer is IFN.

[187] In some embodiments, three cytokines are included in the same construct. In some embodiments, the third cytokine may function to block the other two in place of a blocking domain between the two cytokines.

[188] Preferred half-life extension elements for use in the fusion proteins are human serum albumin (HSA), an antibody or antibody fragment (e.g., scFV, dAb) which binds serum albumin, a human or humanized IgG, or a fragment of any of the foregoing. In some preferred embodiments, the blocking moiety is human serum albumin (HSA), or an antibody or antibody fragment which binds serum albumin, an antibody which binds the cytokine and prevents activation of binding or activation of the cytokine receptor, another cytokine, or a fragment of any of the foregoing. In preferred embodiments comprising an additional targeting domain, the targeting domain is an antibody which binds a cell surface protein which is enriched on the surface of cancer cells, such as EpCAM, FOLR1, and Fibronectin.

[189] In embodiments, the fusion protein can contain an IL-2 polypeptide. The fusion protein containing an IL-2 polypeptide can comprise or consist of the amino acid sequence of any one of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608 and 636-646. The fusion proteins disclosed as SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, and 636-646 are also referred to herein as ACP289-ACP292,

ACP296-ACP302, WW0301, ACP304-ACP306, ACP309-ACP313, WW0353, ACP414, ACP336-ACP398, WW0472-WW0477, ACP406-ACP426, ACP439-ACP447, ACP451-ACP471, WW0729, WW0734-WW0792, ACP101, ACP293-ACP295, ACP316-ACP335, ACP427-ACP438, and ACP448-ACP450. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 272. The fusion protien can comprise the amino acid sequence of SEQ ID NO: 286. The fusion protien can comprise the amino acid sequence of SEQ ID NO:362. The fusion protien can comprise the amino acid sequence of SEQ ID NO:336. The fusion protien can comprise the amino acid sequence of SEQ ID NO: 348. The fusion protien can comprise the amino acid sequence of SEQ ID NO: 363. The fusion protien can comprise the amino acid sequence of SEQ ID NO: 580.

[190] In embodiments, the fusion protein can contain an IL-12 polypeptide. The fusion protein containing an IL-12 polypeptide can comprise or consist of the amino acid sequence of any one of SEQ ID NOs. 368-371, 434-440, 453-519, or 523-538. The fusion proteins disclosed as SEQ ID NOs. 368-371, 434-440, 453-519, or 523-538 are referred to herein as ACP240-ACP245, ACP247, ACP285-ACP288, WW0641, WW0649-WW0652, WW0662-WW0725, WW0765-WW0772, and WW0796-WW0803. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO:459. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 466. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 484. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 506.

[191] In embodiments, the fusion protein contains an IFN (e.g., IFNgamma, IFNalpha, IFNbeta) polypeptide. In some examples the IFN polypeptide is an IFNalpha or an IFNbeta. The fusion protein containing an IFN polypeptide can comprise or consist of the amino acid sequence of SEQ ID NOs. 421-430, and 539-578. The fusion proteins disclosed as SEQ ID NOs. 421-430, and 539-578 can be referred to herein as ACP200-ACP209, WW0644-WW0648, WW0781-WW0786, WW0815-WW0822, WW0831-WW0834, WW0737-WW0748, and WW0787-WW0790. For example, the fusion protein can comprise the amino acid sequence of SEQ ID NO: 421. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 428. The fusion protein can comprise the amino acid sequence of 541. The fusion protein can comprise the amino acid sequence of SEQ IND NO: 558. The fusion protein can comprise the amino acid sequence of SEQ ID NO: 577.

[192] In some aspects, the fusion polypeptide disclosed herein can be covalently or non-covalently bonded to a second polypeptide chain. For example, a fusion polypeptide can dimerize (i.e. form a dimer) or a portion of a fusion polypeptide may associate with another polypeptide, for example, to form a functional binding site for a cytokine polypeptide or serum albumin. In certain embodiments, the second polypeptide chain and the blocking moiety on the fusion polypeptide are complementary and together form a functional binding site that has specificity for the cytokine polypeptide contained in the fusion polypeptide. Exemplary functional binding sites that can be formed by the blocking moiety of the fusion polypeptide and a complimentary second polypeptide include antigen binding

sites of antibodies, such as a Fab fragment of an antibody or a portion thereof. For example, one chain of a Fab that binds the cytokine can be the blocking moiety of the fusion polypeptide, e.g., a VH-CH1, and the complementary VL-CL can be part of the second polypeptide. In such situations, the blocking moiety of the fusion protein i.e., VH-CH1 and the second polypeptide that comprises the complementary VL-CL, can associate to form a functional binding site with specificity for the cytokine polypeptide contained within the fusion protein (e.g., IL-2, IL-12, IFNalpha, IFNbeta) and attenuates cytokine polypeptide activity. At least a portion of the blocking moiety can be on the second polypeptide chain can comprise at least a portion of the blocking moiety that associates with the blocking moiety on the fusion polypeptide.

[193] In embodiments, the fusion protein containing an IL-2 cytokine polypeptide can be bonded covalently or noncovalently to a second polypeptide chain. The second polypeptide chain can contain an antibody light chain VL-CL that comprises or consist of the amino acid sequence of SEQ ID NO: 263, 264, or 333. Such a second polypeptide can bond with a complimentary VH-CH1 polypeptide contained within the fusion protein, e.g., as contained within SEQ ID NOS: 362, 363, 325, 286, 579, 581, or 582 . The second polypeptide chain disclosed as SEQ ID NOs. 263, 264, and 333 can be referred herein as WW0523 (ACP381), WW0524 (ACP382), or WW0556 (ACP414).

[194] In embodiments, the fusion polypeptide can comprise or consist of the amino acid sequence of SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 and the second polypeptide chain can comprise or consist of the amino acid sequence of SEQ ID NOs: 263, 264, or 333. The fusion polypeptide disclosed as SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 can be referred to as WW0520 (ACP378), WW0521 (ACP379), WW0548 (ACP406), WW0621 (ACP457), WW0729, WW0735, or WW0736, and the second polypeptide chain disclosed as SEQ ID NOs. 263, 264, and 333 can be referred herein as WW0523 (ACP381), WW0524 (ACP382), or WW0556 (ACP414).

[195] For example, the fusion protein can comprise or consist the amino acid sequence of SEQ ID NO: 362 and the second polypeptide chain can comprise or consist the amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist the amino acid sequence of SEQ ID NO: 362 and the second polypeptide chain can comprise or consist the amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist the amino acid sequence of SEQ ID NO: 362 and the second polypeptide chain can comprise or consist the amino acid sequence of SEQ ID NO: 333. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 363 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID No. 363 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 363 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 333. For example, the fusion protein can comprise

or consist of an amino acid sequence of SEQ ID NO: 325 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 325 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 333. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 325 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 286 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 286 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 286, and the second polypeptide can comprise or consist of an amino acid sequence of SEW ID NO: 333. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 579 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 579 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of an amino acid sequence of SEQ ID NO: 579 and the second polypeptide chain can comprise or consist of an amino acid sequence of SEQ ID NO: 233. For example, the fusion protein can comprise or consist of SEQ ID NO: 581 and the second polypeptide chain can comprise or consist of SEQ ID NO.: 263. For example, the fusion protein can comprise or consist of SEQ ID NO: 581 and the second polypeptide chain can comprise or consist of SEQ ID NO.: 264. For example, the fusion protein can comprise or consist of SEQ ID NO: 581 and the second polypeptide chain can comprise or consist of SEQ ID NO.: 333. For example, the fusion protein can comprise or consist of SEQ ID NO: 582 and the second polypeptide chain can comprise or consist of SEQ ID NO: 263. For example, the fusion protein can comprise or consist of SEQ ID NO: 582 and the second polypeptide chain can comprise or consist of SEQ ID NO: 264. For example, the fusion protein can comprise or consist of SEQ ID NO: 582 and the second polypeptide chain can comprise or consist of SEQ ID NO: 333.

Methods of treatment and Pharmaceutical Compositions

[196] This disclosure also relates to pharmaceutical compositions that comprise one or more fusion proteins as disclosed herein, optionally in combination with another therapeutic agent, which are preferably immunomodulators or anti-cancer agents. The disclosure also relates to the use of such pharmaceutical compositions, and one or more fusion proteins, optionally in combination with another therapeutic agent in treatment of cancers.

[197] The therapeutic combinations disclosed herein can comprise, for example, a fusion protein containing an IL-2 polypeptide, a fusion protein containing an IL-12 polypeptide, or a fusion protein

containing an IFN polypeptide. Therapy can be provided using two or more fusion proteins. For example, the therapeutic combination can comprise a fusion protein containing an IL-2 polypeptide and a fusion protein containing an IL-12 polypeptide, a fusion protein containing an IL-2 polypeptide and a fusion protein containing an IFN polypeptide, a fusion protein containing an IL-12 polypeptide and a fusion protein containing an IFN polypeptide.

[198] The therapeutic combinations disclosed herein can comprise a fusion polypeptide cytokine polypeptide [A], a blocking moiety [D], optionally a half-life extension moiety [H], and a protease-cleavable polypeptide linker; wherein the cytokine polypeptide and the blocking moiety and the optional half-life extension element when present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, wherein the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker. the fusion polypeptide has the formula:

[A]-[L1]-[H]-[L2]-[D] (I);
[D]-[L2]-[H]-[L1]-[A] (II);
[A]-[L1]-[D]-[L2]-[H] (III);
[H]-[L2]-[D]-[L1]-[A] (IV);
[H]-[L1]-[A]-[L2']-[D] (V);
[D]-[L1]-[A]-[L2']-[H] (VI);

wherein [A] is a cytokine polypeptide, [D] is a blocking moiety, [H] is a half-life extension moiety, [L1] is a protease-cleavable polypeptide linker, [L2] is an polypeptide linker that is optionally protease-cleavable, and [L2'] is a protease-cleavable polypeptide linker.

The therapeutic compositions can comprise a second fusion polypeptide comprising at least one of each of: a second cytokine polypeptide [A], a blocking moiety [D]optionally a half-life extension element [H]; and a protease-cleavable polypeptide linker [L]; wherein the cytokine polypeptide and the cytokine blocking moiety and the optional half-life extension element when present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, wherein the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker. The second fusion polypeptide can have the formula:

[A]-[L1]-[H]-[L2]-[D] (I);
[D]-[L2]-[H]-[L1]-[A] (II);
[A]-[L1]-[D]-[L2]-[H] (III);
[H]-[L2]-[D]-[L1]-[A] (IV);
[H]-[L1]-[A]-[L2']-[D] (V);

[D]-[L1]-[A]-[L2']-[H] (VI);

wherein [A] is a cytokine polypeptide, [D] is a blocking moiety, [H] is a half-life extension moiety, [L1] is a protease-cleavable polypeptide linker, [L2] is an polypeptide linker that is optionally protease-cleavable, and [L2'] is a protease-cleavable polypeptide linker.

[199] The therapeutic combinations disclosed herein can comprise a first fusion protein comprising an amino acid selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578 and a second fusion protein comprising an amino acid sequence selected from the group consisting of selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578. It is preferred that the first fusion protein and the second fusion protein are different. In some preferred embodiments, the therapeutic combination comprises a first fusion protein comprising an amino acid sequence selected from SEQ ID NO: 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646 and a second fusion protein comprising an amino acid sequence selected from SEQ ID NO: 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578. In some preferred embodiments, the therapeutic combination comprises a first fusion proteins comprising an amino acid sequence selected from SEQ ID NO: 368-371, 434-440, 453-519, or 523-538 and a second fusion protein comprising an amino acid sequence selected from SEQ ID NO: 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 636-646, 579-608, 421-430, and 539-578. In some preferred embodiments, the therapeutic combination comprises a first fusion protein comprising an amino acid sequence selected from SEQ ID NO: 421-430, and 539-578 and a second fusion protein comprising an amino acid sequence selected from SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, or combinations thereof.

[200] The therapeutic combination disclosed herein can comprise a first fusion protein that is covalently or non-covalently bonded to a second polypeptide chain and a therapeutic agent. The therapeutic combination can comprise (i) a fusion polypeptide comprising an amino acid sequence selected from SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 and a second polypeptide chain comprising the amino acid sequence of SEQ ID NOs: 263, 264, or 333, and (ii) a second therapeutic agent, wherein the second therapeutic agent is a second fusion polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, 539-578, or combinations thereof. It is preferred that the first fusion protein and the second fusion protein are not the same.

[201] In embodiments, the therapeutic combination can comprise an additional therapeutic agent (e.g., one, two, three, four, five, or more therapeutic agents). In embodiments, the therapeutic

combination can comprise 2 or more fusion proteins and one or more therapeutic agents, preferably agents for treating cancer.

[202] Other exemplary therapeutic agents include, but are not limited to chemotherapeutic agents (e.g., Adriamycin, Cerubidine, Bleomycin, Alkeran, Velban, Oncovin, Fluorouracil, Thiotepa, Methotrexate, Bisantrene, Noantrone, Thiguanine, Cytaribine, Procarabizine), immuno-oncology agents (e.g., anti-PD-L1, anti-CTLA4, anti-PD-1, anti-CD47, anti-GD2, VEGF inhibitor), antibody-drug conjugates, cellular therapies (e.g, CAR-T, T-cell therapy), oncolytic viruses, radiation therapy and/or small molecules.

[203] Non-limiting examples of anti-cancer agents that can be used include acivicin; aclarubicin; acodazole hydrochloride; acronine; adozelesin; aldesleukin; altretamine; ambomycin; ametantrone acetate; aminoglutethimide; amsacrine; anastrozole; anthramycin; asparaginase; asperlin; azacitidine; azetepa; azotomycin; batimastat; benzodepa; bicalutamide; bisantrene hydrochloride; bisnafide dimesylate; bizelesin; bleomycin sulfate; brequinar sodium; bropirimine; busulfan; cactinomycin; calusterone; caracemide; carbetimer; carboplatin; carmustine; carubicin hydrochloride; carzelesin; cedefingol; chlorambucil; cirolemycin; cisplatin; cladribine; crisnatol mesylate; cyclophosphamide; cytarabine; dacarbazine; dactinomycin; daunorubicin hydrochloride; decitabine; dexormaplatin; dezaguanine; dezaguanine mesylate; diaziquone; docetaxel; doxorubicin; doxorubicin hydrochloride; droloxifene; droloxifene citrate; dromostanolone propionate; duazomycin; edatrexate; eflornithine hydrochloride; elsamitrucin; enloplatin; enpromate; epipropidine; epirubicin hydrochloride; erbulozole; esorubicin hydrochloride; estramustine; estramustine phosphate sodium; etanidazole; etoposide; etoposide phosphate; etoprine; fadrozole hydrochloride; fazarabine; fenretinide; floxuridine; fludarabine phosphate; fluorouracil; flurocitabine; fosquidone; fostriecin sodium; gemcitabine; gemcitabine hydrochloride; hydroxyurea; idarubicin hydrochloride; ifosfamide; ilmofosine; interleukin II (including recombinant interleukin II, or rIL2), interferon alpha-2a; interferon alpha-2b; interferon alpha-nl interferon alpha-n3; interferon beta-I a; interferon gamma-I b; iproplatin; irinotecan hydrochloride; lanreotide acetate; letrozole; leuprolide acetate; liarozole hydrochloride; lometrexol sodium; lomustine; losoxantrone hydrochloride; masoprocol; maytansine; mechlorethamine hydrochloride; megestrol acetate; melengestrol acetate; melphalan; menogaril; mercaptopurine; methotrexate; methotrexate sodium; metoprine; meturedepa; mitindomide; mitocarcin; mitocromin; mitogillin; mitomalcin; mitomycin; mitosper; mitotane; mitoxantrone hydrochloride; mycophenolic acid; nocodazole; nogalamycin; ormaplatin; oxisuran; paclitaxel; pegaspargase; peliomycin; pentamustine; peplomycin sulfate; perfosfamide; pipobroman; piposulfan; piroxantrone hydrochloride; plicamycin; plomestane; porfimer sodium; porfiromycin; prednimustine; procarbazine hydrochloride; puromycin; puromycin hydrochloride; pyrazofurin; riboprine; rogletimide; safingol; safingol hydrochloride; semustine; simtrazene; sparfosate sodium; sparsomycin; spirogermanium hydrochloride; spiromustine; spiroplatin; streptonigrin; streptozocin; sulofenur;

talisomycin; tecogalan sodium; tegafur; teloxantrone hydrochloride; temoporfin; teniposide; teroxirone; testolactone; thiamiprine; thioguanine; thiotepa; tiazofurin; tirapazamine; toremifene citrate; trestolone acetate; triciribine phosphate; trimetrexate; trimetrexate glucuronate; triptorelin; tubulozole hydrochloride; uracil mustard; uredepa; vapreotide; verteporfin; vinblastine sulfate; vincristine sulfate; vindesine; vindesine sulfate; vinepidine sulfate; vinglycinate sulfate; vinleurosine sulfate; vinorelbine tartrate; vinzolidine sulfate; vinzolidine sulfate; vorozole; zeniplatin; zinostatin; zorubicin hydrochloride.

[204] Accordingly, this disclosure relates to a therapeutic combination of any of the fusions proteins disclosed herein (e.g., fusion proteins that comprise an IL-2 polypeptide, and IL-12 polypeptide or an IFN polypeptide) in combination with a chemotherapeutic agent, such as Adriamycin, Cerubidine, Bleomycin, Alkeran, Velban, Oncovin, Fluorouracil, Thiotepa, Methotrexate, Bisantrene, Noantrone, Thiguanine, Cytaribine, Procarabizine. This disclosure relates to a therapeutic combination of any of the fusions proteins disclosed herein (e.g., fusion proteins that comprise an IL-2 polypeptide, and IL-12 polypeptide or an IFN polypeptide) in combination with an antibody-drug conjugate. A variety of antibody drug conjugates that are suitable for use in cancer therapy are well known and typically include an antibody that binds to a cellular antigen that is preferentially express or expressed at high levels on tumor cells, and a cytotoxic drug. This disclosure relates to a therapeutic combination of any of the fusion proteins disclosed herein (e.g., fusion proteins that comprise an IL-2 polypeptide, and IL-12 polypeptide, or an IFN polypeptide) in combination with a cellular therapy, such as CAR-T or T-cell therapy. The disclosure relates to a therapeutic combination of the fusion proteins disclosed herein (e.g., fusion proteins that comprise an IL-2 polypeptide, and IL-12 polypeptide, or an IFN polypeptide) in combination with an oncolytic virus. Exemplary oncolytic viruses include, oncolytic adenoviruses, type 1 herpes simplex virus (HSV), polioviruses, measles virus (MV), Newcastle disease virus (NDV), reoviruses, vesicular stomatitis virus (VSV), and Zika virus. This disclosure relates to a therapeutic combination of any of the fusion proteins disclosed herein (e.g., fusion proteins that comprise an IL-2 polypeptide, and IL-12 polypeptide, or an IFN polypeptide) in combination with radiation therapy, such an external beam radiation or internal therapy radiation therapy.

[205] This disclosure relates to a therapeutic combination of any of the fusion proteins disclosed herein (e.g., fusion proteins that comprise an IL-2 polypeptide, and IL-12 polypeptide, or an IFN polypeptide) in combination with cytokines (e.g., IL-2, IL-15), signal induction inhibitors (e.g., BRAF inhibitors or MEK inhibitors), checkpoint inhibitors (e.g., PDL-1, PD-1, CTLA-4), c-met inhibitors, kinase inhibitors (e.g., VGEF inhibitors), a proteasome inhibitor, mTOR inhibitor, angiogenesis inhibitor. In embodiments, any one of the fusion proteins disclosed herein (e.g., fusion proteins that comprise an IL-2 polypeptide, and IL-12 polypeptide, or an IFN polypeptide) can be combined with an anti-PD-L1 agent or an anti-PD-1 agent. Exemplary PD-1 and/or PD-L1 inhibitors include, but are

not limited to Spartalizumab, Camrelizumab, Sintilimab, Tislelizumab, Toripalimab, Dostarlimab, INCMGA00012, AMP-224, and AMP-514). In embodiments, a fusion protein comprising the amino acid sequence selected from SEQ ID NO: 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578 can be combined with a check-point inhibitor, such as PDL-1, PD-1, or CTL-4.

[206] Further provided are methods of treating a subject with or at risk of developing an of a disease or disorder, such as proliferative disease, a tumorous disease, an inflammatory disease, an immunological disorder, an autoimmune disease, an infectious disease, a viral disease, an allergic reaction, a parasitic reaction, or graft-versus-host disease. The methods disclosed herein are preferably used to treat a subject having cancer. The methods administering to a subject in need thereof an effective amount of a fusion protein as disclosed herein that is typically administered as a pharmaceutical composition. In some embodiments, the method further comprises selecting a subject with or at risk of developing such a disease or disorder. The pharmaceutical composition preferably comprises a blocked cytokine, fragment, variant, subunit, or mutein thereof that is activated at a site of inflammation or a tumor. In one embodiment, the chimeric polypeptide comprises a cytokine polypeptide, fragment or mutein thereof and a serum half-life extension element. In another embodiment, the chimeric polypeptide comprises a cytokine polypeptide, variant, subunit, fragment or mutein thereof and a blocking moiety, e.g. a steric blocking polypeptide, wherein the steric blocking polypeptide is capable of sterically blocking the activity of the cytokine polypeptide, fragment or mutein thereof. In another embodiment, the chimeric polypeptide comprises a cytokine polypeptide, fragment or mutein thereof, a blocking moiety, and a serum half-life extension element.

[207] Inflammation is part of the complex biological response of body tissues to harmful stimuli, such as pathogens, damaged cells, or irritants, and is a protective response involving immune cells, blood vessels, and molecular mediators. The function of inflammation is to eliminate the initial cause of cell injury, clear out necrotic cells and tissues damaged from the original insult and the inflammatory process, and to initiate tissue repair. Inflammation can occur from infection, as a symptom or a disease, e.g., cancer, atherosclerosis, allergies, myopathies, HIV, obesity, or an autoimmune disease. An autoimmune disease is a chronic condition arising from an abnormal immune response to a self-antigen. Autoimmune diseases that may be treated with the polypeptides disclosed herein include but are not limited to lupus, celiac disease, diabetes mellitus type 1, Graves disease, inflammatory bowel disease, multiple sclerosis, psoriasis, rheumatoid arthritis, and systemic lupus erythematosus.

[208] The pharmaceutical composition can comprise one or more protease-cleavable linker sequences. The linker sequence serves to provide flexibility between polypeptides, such that each polypeptide is capable of inhibiting the activity of the first polypeptide. The linker sequence can be located between any or all of the cytokine polypeptide, fragment or mutein thereof, the blocking

moiety, and serum half-life extension element. Optionally, the composition comprises, two, three, four, or five linker sequences. The linker sequence, two, three, or four linker sequences can be the same or different linker sequences. In one embodiment, the linker sequence comprises GGGGS (SEQ ID NO.: 449), GSGSGS (SEQ ID NO.: 450), or $G(SGGG)_2SGGT$ (SEQ ID NO.: 451). In another embodiment, the linker comprises a protease-cleavable sequence selected from group consisting of HSSKLQ (SEQ ID NO.: 25), GPLGVRG (SEQ ID NO.: 445), IPVSLRSG (SEQ ID NO.: 446), VPLSLYSG (SEQ ID NO.: 447), and SGESPAYYTA (SEQ ID NO.: 448).

[209] In some embodiments, the linker is cleaved by a protease selected from the group consisting of a kallikrein, thrombin, chymase, carboxypeptidase A, cathepsin G, an elastase, PR-3, granzyme M, a calpain, a matrix metalloproteinase (MMP), a plasminogen activator, a cathepsin, a caspase, a tryptase, or a tumor cell surface protease.

[210] Suitable linkers can be of different lengths, such as from 1 amino acid (e.g., Gly) to 20 amino acids, from 2 amino acids to 15 amino acids, from 3 amino acids to 12 amino acids, including 4 amino acids to 10 amino acids, amino acids to 9 amino acids, 6 amino acids to 8 amino acids, or 7 amino acids to 8 amino acids, and may be 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16, 17, 18, 19, 20, 21, 22, 23, 24, 25, 26, 27, 28, 29, 30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 40, 41, 42, 43, 44, 45, 46, 47, 48, 49, 50, 51, 52, 53, 54, 55, 56, 57, 58, 59, or 60 amino acids.

[211] Further provided are methods of treating a subject with or at risk of developing cancer. The methods comprise administering to the subject in need thereof an effective amount of a chimeric polypeptide (a fusion protein) as disclosed herein that is typically administered as a pharmaceutical composition. In some embodiments, the method further comprises selecting a subject with or at risk of developing cancer. The pharmaceutical composition preferably comprises a blocked cytokine, fragment or mutein thereof that is activated at a tumor site.

[212] The methods disclosed herein can be used for any suitable cancer including, hematological malignancy, solid tumors, sarcomas, carcinomas, and other solid and non-solid tumors. Illustrative suitable cancers include, for example, acute lymphoblastic leukemia (ALL), acute myeloid leukemia (AML), adrenocortical carcinoma, anal cancer, appendix cancer, astrocytoma, basal cell carcinoma, brain tumor, bile duct cancer, bladder cancer, bone cancer, breast cancer, bronchial tumor, carcinoma of unknown primary origin, cardiac tumor, cervical cancer, chordoma, colon cancer, colorectal cancer, craniopharyngioma, ductal carcinoma, embryonal tumor, endometrial cancer, ependymoma, esophageal cancer, esthesioneuroblastoma, fibrous histiocytoma, Ewing sarcoma, eye cancer, germ cell tumor, gallbladder cancer, gastric cancer, gastrointestinal carcinoid tumor, gastrointestinal stromal tumor, gestational trophoblastic disease, glioma, head and neck cancer, hepatocellular cancer, histiocytosis, Hodgkin lymphoma, hypopharyngeal cancer, intraocular melanoma, islet cell tumor, Kaposi sarcoma, kidney cancer, Langerhans cell histiocytosis, laryngeal cancer, lip and oral cavity cancer, liver cancer, lobular carcinoma in situ, lung cancer, macroglobulinemia, malignant fibrous

histiocytoma, melanoma, Merkel cell carcinoma, mesothelioma, metastatic squamous neck cancer with occult primary, midline tract carcinoma involving NUT gene, mouth cancer, multiple endocrine neoplasia syndrome, multiple myeloma, mycosis fungoides, myelodysplastic syndrome, myelodysplastic/myeloproliferative neoplasm, nasal cavity and par nasal sinus cancer, nasopharyngeal cancer, neuroblastoma, non-small cell lung cancer, oropharyngeal cancer, osteosarcoma, ovarian cancer, pancreatic cancer, papillomatosis, paraganglioma, parathyroid cancer, penile cancer, pharyngeal cancer, pheochromocytomas, pituitary tumor, pleuropulmonary blastoma, primary central nervous system lymphoma, prostate cancer, rectal cancer, renal cell cancer, renal pelvis and ureter cancer, retinoblastoma, rhabdoid tumor, salivary gland cancer, Sezary syndrome, skin cancer, small cell lung cancer, small intestine cancer, soft tissue sarcoma, spinal cord tumor, stomach cancer, T-cell lymphoma, teratoid tumor, testicular cancer, throat cancer, thymoma and thymic carcinoma, thyroid cancer, urethral cancer, uterine cancer, vaginal cancer, vulvar cancer, and Wilms tumor.

[213] Preferably, the tumor is a solid tumor. Colon cancer, lung cancer, melanoma, sarcoma, renal cell carcinoma, and breast cancer are of particular interest.

[214] The method can further involve the administration of one or more additional agents to treat cancer, such as one or more cytokine fusion proteins described herein, chemotherapeutic agents (e.g., Adriamycin, Cerubidine, Bleomycin, Alkeran, Velban, Oncovin, Fluorouracil, Thiotepa, Methotrexate, Bisantrene, Noantrone, Thiguanine, Cytaribine, Procarabizine), immuno-oncology agents (e.g., anti-PD-L1, anti-CTLA4, anti-PD-1, anti-CD47, anti-GD2, VEGF inhibitor), cellular therapies (e.g, CAR-T, T-cell therapy), oncolytic viruses, radiation therapy and the like.

[215] In embodiments, the fusion proteins described herein, can be administered with one or more additional cytokine fusion proteins that are inducible. For example, a fusion protein containing an IL-2 polypeptide, as described herein, may be administered with fusion protein containing an IL-12 polypeptide, an IFN polypeptide, a different IL-2 polypeptide or a combinations thereof. A fusion protein containing an IL-12 polypeptide, as described herein, may be administered with a fusion protein containing an IL-2 polypeptide, an IFN polypeptide, a different IL-12 polypeptide or a combinations thereof. A fusion protein containing an IFN polypeptide, as described herein, may be administered with a fusion protein containing anIL-2 polypeptide, an IL-12 polypeptide, an different IFN polypeptide, or a combinations thereof.

[216] In some preferred embodiments, a first fusion protein comprising the amino acid sequence of any one of SEQ ID NOS: 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, and 636-646 can be administered with a second different fusion protein comprising an amino acid sequence of any one of SEQ ID NOs. 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578. In some preferred embodiments, a first fusion proteins comprising the amino acid sequence of any one of 368-371, 434-440, 453-519, or 523-538 can be administered with a second different fusion protein comprising an amino acid sequence of any one of SEQ ID NOs. 257-300, 302-317,

325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 421-430, and 539-578. In some preferred embodiments, a first fusion protein comprising the amino acid sequence of any one of SEQ ID NOs. 421-430, and 539-578 can be administered with a second different fusion protein comprising the amino acid sequence of any one of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, or combinations thereof.

[217] Further exemplary agents that can be administered in combination with one or more inducible cytokine fusion proteins described herein include, but are not limited to cytokines (e.g., IL-2, IL-15), signal induction inhibitors (e.g., BRAF inhibitors or MEK inhibitors), checkpoint inhibitors (e.g., PDL-1, PD-1, CTLA-4), c-met inhibitors, kinase inhibitors (e.g., VGEF inhibitors), a proteasome inhibitor, mTOR inhibitor, angiogenesis inhibitor.

[218] A preferred immuno-oncology agent is an anti-PD-L1 agent or an anti-PD-1. Exemplary PD-1 and/or PD-L1 inhibitors include, but are not limited to Spartalizumab, Camrelizumab, Sintilimab, Tislelizumab, Toripalimab, Dostarlimab, INCMGA00012, AMP-224, and AMP-514). In embodiments, a fusion protein disclosed as 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578 can be administered in combination with a check-point inhibitor, such as PDL-1, PD-1, or CTL-4.

[219] Provided herein are pharmaceutical formulations or compositions containing the chimeric polypeptides and a pharmaceutically acceptable carrier. The herein provided compositions are suitable for administration *in vitro* or *in vivo*. By pharmaceutically acceptable carrier is meant a material that is not biologically or otherwise undesirable, i.e., the material is administered to a subject without causing undesirable biological effects or interacting in a deleterious manner with the other components of the pharmaceutical formulation or composition in which it is contained. The carrier is selected to minimize degradation of the active ingredient and to minimize adverse side effects in the subject.

[220] Suitable carriers and their formulations are described in *Remington: The Science and Practice of Pharmacy,* 21st Edition, David B. Troy, ed., Lippicott Williams & Wilkins (2005). Typically, an appropriate amount of a pharmaceutically-acceptable salt is used in the formulation to render the formulation isotonic, although the formulate can be hypertonic or hypotonic if desired. Examples of the pharmaceutically-acceptable carriers include, but are not limited to, sterile water, saline, buffered solutions like Ringer's solution, and dextrose solution. The pH of the solution is generally about 5 to about 8 or from about 7 to 7.5. Other carriers include sustained release preparations such as semipermeable matrices of solid hydrophobic polymers containing the immunogenic polypeptides. Matrices are in the form of shaped articles, e.g., films, liposomes, or microparticles. Certain carriers may be more preferable depending upon, for instance, the route of administration and concentration of composition being administered. Carriers are those suitable for administration of the chimeric

polypeptides or nucleic acid sequences encoding the chimeric polypeptides to humans or other subjects.

[221] The pharmaceutical formulations or compositions are administered in a number of ways depending on whether local or systemic treatment is desired and on the area to be treated. The compositions are administered via any of several routes of administration, including topically, orally, parenterally, intravenously, intra-articularly, intraperitoneally, intramuscularly, subcutaneously, intracavity, transdermally, intrahepatically, intracranially, nebulization/inhalation, or by installation via bronchoscopy. In some embodiments, the compositions are administered locally (non-systemically), including intratumorally, intra-articularly, intrathecally, etc.

[222] Preparations for parenteral administration include sterile aqueous or non-aqueous solutions, suspensions, and emulsions. Examples of non-aqueous solvents are propylene glycol, polyethylene glycol, vegetable oils such as olive oil, and injectable organic esters such as ethyl oleate. Aqueous carriers include water, alcoholic/aqueous solutions, emulsions or suspensions, including saline and buffered media. Parenteral vehicles include sodium chloride solution, Ringer's dextrose, dextrose and sodium chloride, lactated Ringer's, or fixed oils. Intravenous vehicles include fluid and nutrient replenishers, electrolyte replenishers (such as those based on Ringer's dextrose), and the like. Preservatives and other additives are optionally present such as, for example, antimicrobials, anti-oxidants, chelating agents, and inert gases and the like.

[223] Formulations for topical administration include ointments, lotions, creams, gels, drops, suppositories, sprays, liquids, and powders. Conventional pharmaceutical carriers, aqueous, powder, or oily bases, thickeners and the like are optionally necessary or desirable.

[224] Compositions for oral administration include powders or granules, suspension or solutions in water or non-aqueous media, capsules, sachets, or tables. Thickeners, flavorings, diluents, emulsifiers, dispersing aids or binders are optionally desirable.

[225] Optionally, the chimeric polypeptides or nucleic acid sequences encoding the chimeric polypeptides are administered by a vector. There are a number of compositions and methods which can be used to deliver the nucleic acid molecules and/or polypeptides to cells, either *in vitro* or *in vivo* via, for example, expression vectors. These methods and compositions can largely be broken down into two classes: viral based delivery systems and non-viral based delivery systems. Such methods are well known in the art and readily adaptable for use with the compositions and methods described herein. Such compositions and methods can be used to transfect or transduce cells in vitro or in vivo, for example, to produce cell lines that express and preferably secrete the encoded chimeric polypeptide or to therapeutically deliver nucleic acids to a subject. The components of the chimeric nucleic acids disclosed herein typically are operably linked in frame to encode a fusion protein.

[226] As used herein, plasmid or viral vectors are agents that transport the disclosed nucleic acids into the cell without degradation and include a promoter yielding expression of the nucleic acid

molecule and/or polypeptide in the cells into which it is delivered. Viral vectors are, for example, Adenovirus, Adeno-associated virus, herpes virus, Vaccinia virus, Polio virus, Sindbis, and other RNA viruses, including these viruses with the HIV backbone. Also preferred are any viral families which share the properties of these viruses which make them suitable for use as vectors. Retroviral vectors, in general are described by Coffin et al., Retroviruses, Cold Spring Harbor Laboratory Press (1997), which is incorporated by reference herein for the vectors and methods of making them. The construction of replication-defective adenoviruses has been described (Berkner et al., J. Virol. 61:1213-20 (1987); Massie et al., Mol. Cell. Biol. 6:2872-83 (1986); Haj-Ahmad et al., J. Virol. 57:267-74 (1986); Davidson et al., J. Virol. 61:1226-39 (1987); Zhang et al., BioTechniques 15:868-72 (1993)). The benefit and the use of these viruses as vectors is that they are limited in the extent to which they can spread to other cell types, since they can replicate within an initial infected cell, but are unable to form new infectious viral particles. Recombinant adenoviruses have been shown to achieve high efficiency after direct, in vivo delivery to airway epithelium, hepatocytes, vascular endothelium, CNS parenchyma, and a number of other tissue sites. Other useful systems include, for example, replicating and host-restricted non-replicating vaccinia virus vectors.

[227] The provided polypeptides and/or nucleic acid molecules can be delivered via virus like particles. Virus like particles (VLPs) consist of viral protein(s) derived from the structural proteins of a virus. Methods for making and using virus like particles are described in, for example, Garcea and Gissmann, Current Opinion in Biotechnology 15:513-7 (2004).

[228] The provided polypeptides can be delivered by subviral dense bodies (DBs). DBs transport proteins into target cells by membrane fusion. Methods for making and using DBs are described in, for example, Pepperl-Klindworth et al., Gene Therapy 10:278-84 (2003).

[229] The provided polypeptides can be delivered by tegument aggregates. Methods for making and using tegument aggregates are described in International Publication No. WO 2006/110728.

[230] Non-viral based delivery methods, can include expression vectors comprising nucleic acid molecules and nucleic acid sequences encoding polypeptides, wherein the nucleic acids are operably linked to an expression control sequence. Suitable vector backbones include, for example, those routinely used in the art such as plasmids, artificial chromosomes, BACs, YACs, or PACs. Numerous vectors and expression systems are commercially available from such corporations as Novagen (Madison, Wis.), Clonetech (Pal Alto, Calif.), Stratagene (La Jolla, Calif.), and Invitrogen/Life Technologies (Carlsbad, Calif.). Vectors typically contain one or more regulatory regions. Regulatory regions include, without limitation, promoter sequences, enhancer sequences, response elements, protein recognition sites, inducible elements, protein binding sequences, 5′ and 3′ untranslated regions (UTRs), transcriptional start sites, termination sequences, polyadenylation sequences, and introns. Such vectors can also be used to make the chimeric polypeptides by expression is a suitable host cell, such as CHO cells.

[231] Preferred promoters controlling transcription from vectors in mammalian host cells may be obtained from various sources, for example, the genomes of viruses such as polyoma, Simian Virus 40 (SV40), adenovirus, retroviruses, hepatitis B virus, and most preferably cytomegalovirus (CMV), or from heterologous mammalian promoters, e.g. β-actin promoter or EF1α promoter, or from hybrid or chimeric promoters (e.g., CMV promoter fused to the β-actin promoter). Of course, promoters from the host cell or related species are also useful herein.

[232] Enhancer generally refers to a sequence of DNA that functions at no fixed distance from the transcription start site and can be either 5′ or 3′ to the transcription unit. Furthermore, enhancers can be within an intron as well as within the coding sequence itself. They are usually between 10 and 300 base pairs (bp) in length, and they function in cis. Enhancers usually function to increase transcription from nearby promoters. Enhancers can also contain response elements that mediate the regulation of transcription. While many enhancer sequences are known from mammalian genes (globin, elastase, albumin, fetoprotein, and insulin), typically one will use an enhancer from a eukaryotic cell virus for general expression. Preferred examples are the SV40 enhancer on the late side of the replication origin, the cytomegalovirus early promoter enhancer, the polyoma enhancer on the late side of the replication origin, and adenovirus enhancers.

[233] The promoter and/or the enhancer can be inducible (e.g. chemically or physically regulated). A chemically regulated promoter and/or enhancer can, for example, be regulated by the presence of alcohol, tetracycline, a steroid, or a metal. A physically regulated promoter and/or enhancer can, for example, be regulated by environmental factors, such as temperature and light. Optionally, the promoter and/or enhancer region can act as a constitutive promoter and/or enhancer to maximize the expression of the region of the transcription unit to be transcribed. In certain vectors, the promoter and/or enhancer region can be active in a cell type specific manner. Optionally, in certain vectors, the promoter and/or enhancer region can be active in all eukaryotic cells, independent of cell type. Preferred promoters of this type are the CMV promoter, the SV40 promoter, the β-actin promoter, the EF1α promoter, and the retroviral long terminal repeat (LTR).

[234] The vectors also can include, for example, origins of replication and/or markers. A marker gene can confer a selectable phenotype, e.g., antibiotic resistance, on a cell. The marker product is used to determine if the vector has been delivered to the cell and once delivered is being expressed. Examples of selectable markers for mammalian cells are dihydrofolate reductase (DHFR), thymidine kinase, neomycin, neomycin analog G418, hygromycin, puromycin, and blasticidin. When such selectable markers are successfully transferred into a mammalian host cell, the transformed mammalian host cell can survive if placed under selective pressure. Examples of other markers include, for example, the *E. coli* lacZ gene, green fluorescent protein (GFP), and luciferase. In addition, an expression vector can include a tag sequence designed to facilitate manipulation or detection (e.g., purification or localization) of the expressed polypeptide. Tag sequences, such as GFP,

glutathione S-transferase (GST), polyhistidine, c-myc, hemagglutinin, or FLAG™ tag (Kodak; New Haven, Conn.) sequences typically are expressed as a fusion with the encoded polypeptide. Such tags can be inserted anywhere within the polypeptide including at either the carboxyl or amino terminus.

[235] As used herein, the terms peptide, polypeptide, or protein are used broadly to mean two or more amino acids linked by a peptide bond. Protein, peptide, and polypeptide are also used herein interchangeably to refer to amino acid sequences. It should be recognized that the term polypeptide is not used herein to suggest a particular size or number of amino acids comprising the molecule and that a peptide of the invention can contain up to several amino acid residues or more. As used throughout, subject can be a vertebrate, more specifically a mammal (e.g. a human, horse, cat, dog, cow, pig, sheep, goat, mouse, rabbit, rat, and guinea pig), birds, reptiles, amphibians, fish, and any other animal. The term does not denote a particular age or sex. Thus, adult and newborn subjects, whether male or female, are intended to be covered. As used herein, patient or subject may be used interchangeably and can refer to a subject with a disease or disorder (e.g. cancer). The term patient or subject includes human and veterinary subjects.

[236] A subject at risk of developing a disease or disorder can be genetically predisposed to the disease or disorder, e.g., have a family history or have a mutation in a gene that causes the disease or disorder, or show early signs or symptoms of the disease or disorder. A subject currently with a disease or disorder has one or more than one symptom of the disease or disorder and may have been diagnosed with the disease or disorder.

[237] The methods and agents as described herein are useful for both prophylactic and therapeutic treatment. For prophylactic use, a therapeutically effective amount of the chimeric polypeptides or chimeric nucleic acid sequences encoding the chimeric polypeptides described herein are administered to a subject prior to onset (e.g., before obvious signs of cancer or inflammation) or during early onset (e.g., upon initial signs and symptoms of cancer or inflammation). Prophylactic administration can occur for several days to years prior to the manifestation of symptoms of cancer or inflammation. Prophylactic administration can be used, for example, in the preventative treatment of subjects diagnosed with a genetic predisposition to cancer. Therapeutic treatment involves administering to a subject a therapeutically effective amount of the chimeric polypeptides or nucleic acid sequences encoding the chimeric polypeptides described herein after diagnosis or development of cancer or inflammation (e.g., an autoimmune disease). Prophylactic use may also apply when a patient is undergoing a treatment, e.g., a chemotherapy, in which inflammation is expected.

[238] According to the methods taught herein, the subject is administered an effective amount of the agent (e.g., a chimeric polypeptide). The terms effective amount and effective dosage are used interchangeably. The term effective amount is defined as any amount necessary to produce a desired physiologic response. Effective amounts and schedules for administering the agent may be determined empirically, and making such determinations is within the skill in the art. The dosage ranges for

administration are those large enough to produce the desired effect in which one or more symptoms of the disease or disorder are affected (e.g., reduced or delayed). The dosage should not be so large as to cause substantial adverse side effects, such as unwanted cross-reactions, anaphylactic reactions, and the like. Generally, the dosage will vary with the age, condition, sex, type of disease, the extent of the disease or disorder, route of administration, or whether other drugs are included in the regimen, and can be determined by one of skill in the art. The dosage can be adjusted by the individual physician in the event of any contraindications. Dosages can vary and can be administered in one or more dose administrations daily, for one or several days. Guidance can be found in the literature for appropriate dosages for given classes of pharmaceutical products.

[239] As used herein the terms treatment, treat, or treating refers to a method of reducing the effects of a disease or condition or symptom of the disease or condition. Thus, in the disclosed method, treatment can refer to a 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, or 100% reduction in the severity of an established disease or condition or symptom of the disease or condition. For example, a method for treating a disease is considered to be a treatment if there is a 10% reduction in one or more symptoms of the disease in a subject as compared to a control. Thus, the reduction can be a 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90%, 100%, or any percent reduction in between 10% and 100% as compared to native or control levels. It is understood that treatment does not necessarily refer to a cure or complete ablation of the disease, condition, or symptoms of the disease or condition.

[240] As used herein, the terms prevent, preventing, and prevention of a disease or disorder refers to an action, for example, administration of the chimeric polypeptide or nucleic acid sequence encoding the chimeric polypeptide, that occurs before or at about the same time a subject begins to show one or more symptoms of the disease or disorder, which inhibits or delays onset or exacerbation of one or more symptoms of the disease or disorder. As used herein, references to decreasing, reducing, or inhibiting include a change of 10%, 20%, 30%, 40%, 50%, 60%, 70%, 80%, 90% or greater as compared to a control level. Such terms can include but do not necessarily include complete elimination.

[241] IL-2 variants have been developed that are selective for IL2Rαβγ relative to IL2Rβγ (Shanafelt, A. B., et al., 2000, Nat Biotechnol.18:1197-202; Cassell, D. J., et. al., 2002, Curr Pharm Des., 8:2171-83). These variants have amino acid substitutions which reduce their affinity for IL2RB. Because IL-2 has undetectable affinity for IL2RG, these variants consequently have reduced affinity for the IL2Rβγ receptor complex and reduced ability to activate IL2Rβγ-expressing cells, but retain the ability to bind IL2RA and the ability to bind and activate the IL2Rαβγ receptor complex.

[242] One of these variants, IL2/N88R (Bay 50-4798), was clinically tested as a low- toxicity version of IL-2 as an immune system stimulator, based on the hypothesis that IL2Rβγ-expressing NK cells are a major contributor to toxicity. Bay 50-4798 was shown to selectively stimulate the proliferation of activated T cells relative to NK cells, and was evaluated in phase I/II clinical trials in

cancer patients (Margolin, K., et. al., 2007, Clin Cancer Res., 13:3312-9) and HIV patients (Davey, R. T., et. al., 2008, J Interferon Cytokine Res., 28:89-100). These clinical trials showed that Bay 50-4798 was considerably safer and more tolerable than aldesleukin, and also showed that it increased the levels of CD4+CD25+ T cells, a cell population enriched in Treg cells. Subsequent to these trials, research in the field more fully established the identity of Treg cells and demonstrated that Treg cells selectively express IL2Rαβγ (reviewed in Malek, T. R., et al., 2010, Immunity, 33:153-65).

[243] In addition, mutants can be made that selectively alter the affinity for the CD25 chain relative to native Il-2.

[244] IL-2 can be engineered to produce mutants that bind the IL-2R complex generally or the IL-2Rα subunit specifically with an affinity that differs from that of the corresponding wild-type IL-2 or of a presently available mutant (referred to as C125S, as the cysteine residue at position 125 is replaced with a serine residue).

[245] Accordingly, the present invention features mutant interleukin-2 (IL-2*) polypeptides that include an amino acid sequence that is at least 80% identical to wild-type IL-2 (e.g., 85, 87, 90, 95, 97, 98, or 99% identical) and that bind, as compared to WT IL-2, with higher to the IL-2 trimeric receptor relative to the dimeric IL-2 receptor. Typically, the muteins will also bind an IL-2 receptor α subunit (IL-2Rα) with an affinity that is greater than the affinity with which wild type IL-2 binds the IL-2Rα. The amino acid sequence within mutant IL-2 polypeptides can vary from SEQ ID NO:1 (UniProtKB accession number P60568) by virtue of containing (or only containing) one or more amino acid substitutions, which may be considered conservative or non-conservative substitutions. Non-naturally occurring amino acids can also be incorporated. Alternatively, or in addition, the amino acid sequence can vary from SEQ ID NO:1 (which may be considered the "reference" sequence) by virtue of containing and addition and/or deletion of one or more amino acid residues. More specifically, the amino acid sequence can differ from that of SEQ ID NO:1 by virtue of a mutation at least one of the following positions of SEQ ID NO:1: 1, 4, 8, 9, 10, 11, 13, 15, 26, 29, 30, 31, 35, 37, 46, 48, 49, 54, 61, 64, 67, 68, 69, 71, 73, 74, 75, 76, 79, 88, 89, 90, 92, 99, 101, 103, 114, 125, 128, or 133 (or combinations thereof). As noted, as few as one of these positions may be altered, as may two, three, four, five, six, seven, eight, nine, ten, or 11 or more (including up to all) of the positions. For example, the amino acid sequence can differ from SEQ ID NO:1 at positions 69 and 74 and further at one or more of positions 30, 35, and 128. The amino acid sequence can also differ from SEQ ID NO:2 (as disclosed in US 7569215, incorporated herein by reference) at one of the following sets of positions: (a) positions 64, 69, and 74; (b) positions 69, 74, and 101; (c) positions 69, 74, and 128; (d) positions 30, 69, 74, and 103; (e) positions 49, 69, 73, and 76; (f) positions 69, 74, 101, and 133; (g) positions 30, 69, 74, and 128; (h) positions 69, 74, 88, and 99; (i) positions 30, 69, 74, and 128; (j) positions 9, 11, 35, 69, and 74; (k) positions 1, 46, 49, 61, 69, and 79; (1) positions 48, 68, 71, 90, 103, and 114; (m) positions 4, 10, 11, 69, 74, 88, and 133; (n) positions 15, 30 31, 35, 48, 69, 74, and

92; (O) positions 30, 68, 69, 71, 74, 75, 76, and 90; (p) positions 30, 31, 37, 69, 73, 74, 79, and 128; (q) positions 26, 29, 30, 54, 67, 69, 74, and 92; (r) positions 8, 13, 26, 30, 35, 37, 69, 74, and 92; and (s) positions 29, 31, 35, 37, 48, 69, 71, 74, 88, and 89. Aside from mutations at these positions, the amino acid sequence of the mutant IL-2 polypeptide can otherwise be identical to SEQ ID NO:1. With respect to specific substitutions, the amino acid sequence can differ from SEQ ID NO:1 by virtue of having one or more of the following mutations: A1T, S4P, K8R, K9T, T10A, Q11R, Q13R, E15K, N26D, N29S, N30S, N30D, N30T, Y31H, Y31C, K35R, T37A, T37R, M46L, K48E, K49R, K49E, K54R, E61D, K64R, E67G, E68D, V69A, N71T, N71A, N71R, A73V, Q74P, S75P, K76E, K76R, H79R, N88D, I89V, N90H, I92T, S99P, T101A, F103S, I114V, I128T, I128A, T133A, or T133N. Our nomenclature is consistent with that of the scientific literature, where the single letter code of the amino acid in the wild-type or reference sequence is followed by its position within the sequence and then by the single letter code of the amino acid with which it is replaced. Thus, A1T designates a substitution of the alanine residue a position 1 with threonine. Other mutant polypeptides within the scope of the invention include those that include a mutant of SEQ ID NO:2 having substitutions at V69 (e.g. A) and Q74 (e.g., P). For example, the amino acid sequence can include one of the following sets of mutations with respect to SEQ ID NO:2: (a) K64R, V69A, and Q74P; (b) V69A, Q74P, and T101A; (c) V69A, Q74P, and I128T; (d) N30D, V69A, Q74P, and F103S; (e) K49E, V69A, A73V, and K76E; (f) V69A, Q74P, T101A, and T133N; (g) N30S, V69A, Q74P, and I128A; (h) V69A, Q74P, N88D, and S99P; (i) N30S, V69A, Q74P, and I128T; (j) K9T, Q11R, K35R, V69A, and Q74P; (k) A1T, M46L, K49R, E61D, V69A, and H79R; (l) K48E, E68D, N71T, N90H, F103S, and I114V; (m) S4P, T10A, Q11R, V69A, Q74P, N88D, and T133A; (n) E15K, N30S Y31H, K35R, K48E, V69A, Q74P, and I92T; (o) N30S, E68D, V69A, N71A, Q74P, S75P, K76R, and N90H; (p) N30S, Y31C, T37A, V69A, A73V, Q74P, H79R, and I128T; (q) N26D, N29S, N30S, K54R, E67G, V69A, Q74P, and I92T; (r) K8R, Q13R, N26D, N30T, K35R, T37R, V69A, Q74P, and I92T; and (s) N29S, Y31H, K35R, T37A, K48E, V69A, N71R, Q74P, N88D, and I89V. SEQ ID NO:2 is disclosed in US 7569215, which is incorporated herein by reference as an exemplary IL-2 polypeptide sequence that can be used in the invention.

[246] As noted above, any of the mutant IL-2 polypeptides disclosed herein can include the sequences described; they can also be limited to the sequences described and otherwise identical to SEQ ID NO:1. Moreover, any of the mutant IL-2 polypeptides described herein can optionally include a substitution of the cysteine residue at position 125 with another residue (e.g., serine) and/or can optionally include a deletion of the alanine residue at position 1 of SEQ ID NO:1.

[247] The mutant IL-2 polypeptides disclosed herein can bind to the IL-2Rα subunit with a K_d of less than about 28 nM (e.g., less than about 25 nM; less than about 5 nM; about 1 nM; less than about 500 pM; or less than about 100 pM). More specifically, a mutant IL-2 polypeptide can have an affinity equilibrium constant less than 1.0 nM (e.g., about 0.8, 0.6, 0.4, or 0.2 nM). Affinity can also

be expressed as a relative rate of dissociation from an IL-2Rα subunit or from an IL-2 receptor complex (e.g., a complex expressed on the surface of a cell or otherwise membrane bound). For example, the mutant IL-2 polypeptides can dissociate from, e.g., IL-2Rα, at a decreased rate relative to a wild-type polypeptide or to an IL-2 based therapeutic, e.g., IL-2*. Alternatively, affinity can be characterized as the time, or average time, an IL-2* polypeptide persists on, for example, the surface of a cell expressing an IL-2R. For example, an IL-2*polypeptide can persist on the receptor for at least about 2, 5, 10, 50, 100, or 250 times (or more).

[248] Disclosed are materials, compositions, and components that can be used for, can be used in conjunction with, can be used in preparation for, or are products of the disclosed methods and compositions. These and other materials are disclosed herein, and it is understood that when combinations, subsets, interactions, groups, etc. of these materials are disclosed that while specific reference of each various individual and collective combinations and permutations of these compounds may not be explicitly disclosed, each is specifically contemplated and described herein. For example, if a method is disclosed and discussed and a number of modifications that can be made to a number of molecules including the method are discussed, each and every combination and permutation of the method, and the modifications that are possible are specifically contemplated unless specifically indicated to the contrary. Likewise, any subset or combination of these is also specifically contemplated and disclosed. This concept applies to all aspects of this disclosure including, but not limited to, steps in methods using the disclosed compositions. Thus, if there are a variety of additional steps that can be performed, it is understood that each of these additional steps can be performed with any specific method steps or combination of method steps of the disclosed methods, and that each such combination or subset of combinations is specifically contemplated and should be considered disclosed.

[249] Publications cited herein and the material for which they are cited are hereby specifically incorporated by reference in their entireties.

EXAMPLES

[250] The following are examples of methods and compositions of the invention. It is understood that various other embodiments may be practiced, given the general description provided herein.

Example 1: Detection of IL-2, IL-2 mutein, IL-2Rα and IL-2Rγ in Fusion Proteins by ELISA

[251] IL-2 mutein is detected with a commercially available antibody, e.g., the anti-IL-2 monoclonal (JES6-1A12) (BD Pharmingen; San Jose, Calif.). A positive control is used to show whether the monoclonal antibody recognizes the cytokine or mutein. Antibodies against IL-2Rα and IL-2Rγ chain are also used. Wells of a 96-well plate are coated with an antibody (2.5 μg/ml) in PBS. Wells are blocked with 5% non-fat milk in PBS with 0.2% Tween®20 (PBS-M-Tw) and fusion

proteins are added for 1-2 hours at 37° C. After washing, an anti-IL-2 biotin-labeled antibody, e.g., JES5H4 (BD Pharmingen) is added and binding is detected using Strepavidin HRP (Southern Biotechnology Associates; Birmingham, Ala.). The ELISA plate is developed by adding 50 µl O-phenylenediamine (OPD) (Sigma-Aldrich) in 0.1M Citrate pH 4.5 and 0.04% H_2O_2, stopped by adding 50 µl/well 2N H_2SO_4 and the absorbance was read at 490 nm.

Example 2: Protease cleavage of fusion protein by MMP9 protease

[252] One of skill in the art would be familiar with methods of setting up protein cleavage assay. 100ug of protein in 1xPBS pH 7.4 were cleaved with 1 µg active MMP9 (Sigma catalog # SAE0078-50 or Enzo catalog BML-SE360) and incubated at room temperature for up to 16 hours. Digested protein is subsequently used in functional assays or stored at -80°C prior to testing. Extent of cleavage was monitored by SDS PAGE using methods well known in the art. As shown in **FIGs. 10, 13, 18A, 18B, 24B, 24C, and 27A** full cleavage of the fusion proteins by MMP9 protease is seen.

Example 3: CTLL-2 assay

[253] CTLL2 cells (ATCC) were plated in suspension at a concentration of 500,000 cells/well in culture media with or without 40mg/ml human serum albumin (HSA) and stimulated with a dilution series of recombinant hIL2 or activatable hIL2 for 72 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved activatable hIL2 was tested. Cleaved activatable hIL2 was generated by incubation with active MMP9. Cell activity was assessed using a CellTiter-Glo (Promega) luminescence-based cell viability assay.

Example 4: Protease Cleavage of the IL-2/IL-2Rα/IL-2Rγ Chimeric Polypeptide Results in Increased Accessibility to Antibodies and Biologically Active IL-2 mutein

[254] The IL-2 mutein fusion proteins are biochemically characterized before and after cleavage with a protease, e.g., PSA. Immunoblot analyses will show that the fusion proteins can be cleaved by PSA and that there is an increase in intensity of the predicted low molecular weight cleavage product of approximately 20 kDa reactive with an anti-IL-2 antibody after treatment of the samples with PSA. The degree of cleavage is dependent upon the amount of PSA as well as the time of incubation. Interestingly, when the fusion protein is analyzed before and after PSA treatment by ELISA, it was found that the apparent amount of IL-2 is increased after PSA cleavage. In this experiment, there is an approximately 2 or 4-fold increase in the apparent amount of IL-2 detected using this sandwich ELISA depending on the construct, suggesting that the antibody binding is partially hindered in the intact fusion protein. Aliquots of the same samples are also analyzed after PSA treatment using the CTLL-2 cell line that requires IL-2 for growth and survival and the viability of cells can be ascertained using the colorimetric MTT assay. In this assay, the more a supernatant can be diluted, the

more biologically active IL-2 it contains, and there is an increase in the amount of biologically active IL-2 after PSA cleavage. The amount of IL-2 mutein increase will suggest that after PSA cleavage there is an increase in the predicted low molecular weight cleavage fragment of approximately 20 kDa reactive with an anti-IL-2 antibody, an increase in antibody accessibility, and most importantly, an increase in the amount of biologically active IL-2 mutein.

Example 5. *In Vivo* Delivery of a Protease Activated Fusion Protein Results in Decreased Tumor Growth

[255] The chimeric polypeptide is examined to determine if it could have biological effects *in vivo*. For these experiments a system is used in which tumor cells injected intraperitoneally rapidly and preferentially attach and grow initially on the milky spots, a series of organized immune aggregates found on the omentum (Gerber et al., Am. J. Pathol. 169:1739-52 (2006)). This system offers a convenient way to examine the effects of fusion protein treatment on tumor growth since fusion proteins can be delivered intraperitoneally multiple times and tumor growth can be analyzed by examining the dissociated omental cells. For these experiments, the Colon 38 cell line, a rapidly growing tumor cell line that expresses both MMP2 and MMP9 *in vitro*, may be used. The omental tissue normally expresses a relatively small amount of MMP2 and MMP9, but, when Colon 38 tumor is present on the omentum, MMP levels increase. Using this tumor model, the ability of IL-2 mutein fusion proteins to affect tumor growth is examined. Colon 38 cells are injected intraperitoneally, allowed to attach and grow for 1 day, and then treated daily with fusion protein interaperitoneally. At day 7, the animals are sacrificed and the omenta examined for tumor growth using flow cytometry and by a colony-forming assay.

Example 6: Construction of an Exemplary Activatable IL2 Protein Targeting CD20

Generation of an activatable IL2 domain

[256] An IL-2 polypeptide capable of binding to CD20 polypeptide present in a tumor or on a tumor cell is produced as follows. A nucleic acid is produced that contains nucleic acid sequences: (1) encoding an IFNγ polypeptide sequence and (2) one or more polypeptide linkers. Activatable interleukin plasmid constructs can have optional Flag, His or other affinity tags, and are electroporated into HEK293 or other suitable human or mammalian cell lines and purified. Validation assays include T cell activation assays using T cells responsive to IFNγ stimulation in the presence of a protease.

Generation of a scFv CD20 binding domain

[257] CD20 is one of the cell surface proteins present on B-lymphocytes. CD20 antigen is found in normal and malignant pre-B and mature B lymphocytes, including those in over 90% of B-cell non-

Hodgkin's lymphomas (NHL). The antigen is absent in hematopoietic stem cells, activated B lymphocytes (plasma cells) and normal tissue. As such, several antibodies mostly of murine origin have been described: 1F5, 2B8/C2B8, 2H7, and 1H4.

[258] Human or humanized anti-CD20 antibodies are therefore used to generate scFv sequences for CD20 binding domains of an activatable interleukin protein. DNA sequences coding for human or humanized VL and VH domains are obtained, and the codons for the constructs are, optionally, optimized for expression in cells from Homo sapiens. The order in which the VL and VH domains appear in the scFv is varied (i.e., VL-VH, or VH-VL orientation), and three copies of the "G4S" (SEQ ID NO.: 449) or "G_4S" (SEQ ID NO.: 449) subunit $(G_4S)_3$ (SEQ ID NO.: 452) connect the variable domains to create the scFv domain. Anti-CD20 scFv plasmid constructs can have optional Flag, His or other affinity tags, and are electroporated into HEK293 or other suitable human or mammalian cell lines and purified. Validation assays include binding analysis by FACS, kinetic analysis using Proteon, and staining of CD20-expressing cells.

Cloning of DNA expression constructs encoding the activatable IL2 protein

[259] The activatable IL2 construct with protease cleavage site domains are used to construct an activatable interleukin protein in combination with an anti-CD20 scFv domain and a serum half-life extension element (e.g., a HSA binding peptide or VH domain). For expression of an activatable interleukin protein in CHO cells, coding sequences of all protein domains are cloned into a mammalian expression vector system. In brief, gene sequences encoding the activatable interleukin domain, serum half-life extension element, and CD20 binding domain along with peptide linkers L1 and L2 are separately synthesized and subcloned. The resulting constructs are then ligated together in the order of CD20 binding domain – L1 – IL2 subunit 1– L2 – protease cleavage domain – L3 – IL2 subunit 2 – L4 – anti-CD20 scFv – L5 – serum half-life extension element to yield a final construct. All expression constructs are designed to contain coding sequences for an N-terminal signal peptide and a C-terminal hexahistidine (6xHis)-tag (SEQ ID NO. 354) to facilitate protein secretion and purification, respectively.

Expression of activatable IL2 proteins in stably transfected CHO cells

[260] A CHO cell expression system (Flp-In®, Life Technologies), a derivative of CHO-K1 Chinese Hamster ovary cells (ATCC, CCL-61) (Kao and Puck, Proc. Natl. Acad Sci USA 1968;60(4):1275-81), is used. Adherent cells are subcultured according to standard cell culture protocols provided by Life Technologies.

[261] For adaption to growth in suspension, cells are detached from tissue culture flasks and placed in serum-free medium. Suspension-adapted cells are cryopreserved in medium with 10% DMSO.

[262] Recombinant CHO cell lines stably expressing secreted activatable interleukin proteins are generated by transfection of suspension-adapted cells. During selection with the antibiotic Hygromycin B viable cell densities are measured twice a week, and cells are centrifuged and resuspended in fresh selection medium at a maximal density of 0.1×10^6 viable cells/mL. Cell pools stably expressing activatable interleukin proteins are recovered after 2-3 weeks of selection at which point cells are transferred to standard culture medium in shake flasks. Expression of recombinant secreted proteins is confirmed by performing protein gel electrophoresis or flow cytometry. Stable cell pools are cryopreserved in DMSO containing medium.

[263] Activatable IL2 proteins are produced in 10-day fed-batch cultures of stably transfected CHO cell lines by secretion into the cell culture supernatant. Cell culture supernatants are harvested after 10 days at culture viabilities of typically >75%. Samples are collected from the production cultures every other day and cell density and viability are assessed. On day of harvest, cell culture supernatants are cleared by centrifugation and vacuum filtration before further use.

[264] Protein expression titers and product integrity in cell culture supernatants are analyzed by SDS-PAGE.

Purification of activatable IL2 proteins

[265] Activatable IL2 proteins are purified from CHO cell culture supernatants in a two-step procedure. The constructs are subjected to affinity chromatography in a first step followed by preparative size exclusion chromatography (SEC) on Superdex 200 in a second step. Samples are buffer-exchanged and concentrated by ultrafiltration to a typical concentration of >1 mg/mL. Purity and homogeneity (typically >90%) of final samples are assessed by SDS PAGE under reducing and non-reducing conditions, followed by immunoblotting using an anti-HSA or anti idiotype antibody as well as by analytical SEC, respectively. Purified proteins are stored at aliquots at -80°C until use.

Example 7: Determination of antigen affinity by flow cytometry

[266] The activatable interleukin proteins of Example 6 are tested for their binding affinities to human $CD20^+$ cells and cynomolgus $CD20^+$ cells.

[267] $CD20^+$ cells are incubated with 100 µL of serial dilutions of the activatable interleukin proteins of Example 1 and at least one protease. After washing three times with FACS buffer the cells are incubated with 0.1 mL of 10 µg/mL mouse monoclonal anti-idiotype antibody in the same buffer for 45 min on ice. After a second washing cycle, the cells are incubated with 0.1 mL of 15 µg/mL FITC-conjugated goat anti-mouse IgG antibodies under the same conditions as before. As a control, cells are incubated with the anti-His IgG followed by the FITC-conjugated goat anti-mouse IgG antibodies without the activatable IL2 proteins. The cells were then washed again and resuspended in 0.2 mL of FACS buffer containing 2 µg/mL propidium iodide (PI) in order to exclude dead cells. The

fluorescence of $1x10^4$ living cells is measured using a Beckman-Coulter FC500 MPL flow cytometer using the MXP software (Beckman-Coulter, Krefeld, Germany) or a Millipore Guava EasyCyte flow cytometer using the Incyte software (Merck Millipore, Schwalbach, Germany). Mean fluorescence intensities of the cell samples are calculated using CXP software (Beckman-Coulter, Krefeld, Germany) or Incyte software (Merck Millipore, Schwalbach, Germany). After subtracting the fluorescence intensity values of the cells stained with the secondary and tertiary reagents alone the values are then used for calculation of the K_D values with the equation for one-site binding (hyperbola) of the GraphPad Prism (version 6.00 for Windows, GraphPad Software, La Jolla California USA).

[268] CD20 binding and crossreactivity are assessed on the human $CD20^+$ tumor cell lines. The K_D ratio of crossreactivity is calculated using the K_D values determined on the CHO cell lines expressing either recombinant human or recombinant cynomolgus antigens.

Example 8: Cytotoxicity Assay

[269] The activatable interleukin protein of Example 6 is evaluated *in vitro* on its mediation of immune response to $CD20^+$ target cells.

[270] Fluorescence labeled $CD20^+$ REC-1 cells (a Mantle cell lymphoma cell line, ATCC CRL-3004) are incubated with isolated PBMC of random donors or CB15 T-cells (standardized T-cell line) as effector cells in the presence of the activatable IL2 protein of Example 5 and at least one protease. After incubation for 4 h at 37°C in a humidified incubator, the release of the fluorescent dye from the target cells into the supernatant is determined in a spectrofluorimeter. Target cells incubated without the activatable IL2 protein of Example 1and target cells totally lysed by the addition of saponin at the end of the incubation serve as negative and positive controls, respectively.

[271] Based on the measured remaining living target cells, the percentage of specific cell lysis is calculated according to the following formula: [1-(number of living $targets_{(sample)}$/number of living $targets_{(spontaneous)}$)] x 100%. Sigmoidal dose response curves and EC_{50} values are calculated by non-linear regression/4-parameter logistic fit using the GraphPad Software. The lysis values obtained for a given antibody concentration are used to calculate sigmoidal dose-response curves by 4 parameter logistic fit analysis using the Prism software.

Example 9: Pharmacokinetics of activatable interleukin proteins

[272] The activatable interleukin protein of Example 6 is evaluated for half-time elimination in animal studies.

[273] The activatable IL2 protein is administered to cynomolgus monkeys as a 0.5 mg/kg bolus injection into the saphenous vein. Another cynomolgus monkey group receives a comparable IL2 construct in size, but lacking a serum half-life extension element. A third and fourth group receive an

IL2 construct with serum half-life extension element and a cytokine with CD20 and serum half-life extension elements respectively, and both comparable in size to the activatable interleukin protein. Each test group consists of 5 monkeys. Serum samples are taken at indicated time points, serially diluted, and the concentration of the proteins is determined using a binding ELISA to CD20.

[274] Pharmacokinetic analysis is performed using the test article plasma concentrations. Group mean plasma data for each test article conforms to a multi-exponential profile when plotted against the time post-dosing. The data are fit by a standard two-compartment model with bolus input and first-order rate constants for distribution and elimination phases. The general equation for the best fit of the data for i.v. administration is: $c(t)=Ae^{-\alpha t}+Be^{-\beta t}$, where c(t) is the plasma concentration at time t, A and B are intercepts on the Y-axis, and α and β are the apparent first-order rate constants for the distribution and elimination phases, respectively. The α-phase is the initial phase of the clearance and reflects distribution of the protein into all extracellular fluid of the animal, whereas the second or β-phase portion of the decay curve represents true plasma clearance. Methods for fitting such equations are well known in the art. For example, $A=D/V(\alpha-k21)/(\alpha-\beta)$, $B=D/V(\beta-k21)/(\alpha-\beta)$, and α and β (for $\alpha>\beta$) are roots of the quadratic equation: $r^2+(k12+k21+k10)r+k21k10=0$ using estimated parameters of V=volume of distribution, k10=elimination rate, k12=transfer rate from compartment 1 to compartment 2 and k21=transfer rate from compartment 2 to compartment 1, and D=the administered dose.

[275] Data analysis: Graphs of concentration versus time profiles are made using KaleidaGraph (KaleidaGraph™ V. 3.09 Copyright 1986-1997. Synergy Software. Reading, Pa.). Values reported as less than reportable (LTR) are not included in the PK analysis and are not represented graphically. Pharmacokinetic parameters are determined by compartmental analysis using WinNonlin software (WinNonlin® Professional V. 3.1 WinNonlin™ Copyright 1998-1999. Pharsight Corporation. Mountain View, Calif.). Pharmacokinetic parameters are computed as described in Ritschel W A and Kearns G L, 1999, IN: *Handbook Of Basic Pharmacokinetics Including Clinical Applications,* 5th edition, American Pharmaceutical Assoc., Washington, D.C.

[276] It is expected that the activatable interleukin protein of Example 5 has improved pharmacokinetic parameters such as an increase in elimination half-time as compared to proteins lacking a serum half-life extension element.

Example 10: Xenograft Tumor Model

[277] The activatable IL2 protein of Example 6 is evaluated in a xenograft model.

[278] Female immune-deficient NOD/scid mice are sub-lethally irradiated (2 Gy) and subcutaneously inoculated with $4x10^6$ Ramos RA1 cells into the right dorsal flank. When tumors reach 100 to 200 mm^3, animals are allocated into 3 treatment groups. Groups 2 and 3 (8 animals each) are intraperitoneally injected with $1.5x10^7$ activated human T-cells. Three days later, animals

from Group 3 are subsequently treated with a total of 9 intravenous doses of 50 μg activatable interleukin protein of Example 1 (qdx9d). Groups 1 and 2 are only treated with vehicle. Body weight and tumor volume are determined for 30 days.

[279] It is expected that animals treated with the activatable interleukin protein of Example 5 have a statistically significant delay in tumor growth in comparison to the respective vehicle-treated control group.

[280] While preferred embodiments of the present invention have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

Example 11: Mouse IFNγ WEHI cell survival assay

[281] WEHI279 cells (ATCC) were plated in suspension at a concentration of 25,000 cells/well in culture media with or without 1.5% human serum albumin (HSA) and stimulated with a dilution series of recombinant mIFNγ or inducible mIFNγ for 72 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved inducible mIFNγ was tested. Cleaved inducible mIFNg was generated by incubation with active MMP9. Cell survival was assessed using a CellTiter-Glo (Promega) luminescence-based cell viability assay. The EC50 values for cleaved inducible mIFNg molecules were at least 100x more potent than un-cleaved inducible mIFNg molecules. As shown in **FIGs. 16A-16F**, greater inducibility was seen in assays wherein the culture media contained human serum albumin.

Example 12: Mouse IFNγ B16 reporter and Mouse IFNα/β B16 reporter cell assays

[282] B16-Blue IFNγ cells (InvivoGen) were plated at a concentration of 75,000 cells/well in culture media with or without 1.5% human serum albumin (HSA) and stimulated with a dilution series of recombinant mIFNγ or inducible mIFNγ for 24 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved inducible mIFNγ was tested. Cleaved inducible mIFNγ was generated by incubation with active MMP9. Supernatants were harvested, and SEAP activation was assessed by adding QUANTI-Blue Reagent (InvivoGen), incubating at 37°C for 2 hours, and measuring absorbance at 620nm. Results are shown in **FIGs. 17A-17F, 19A, 19B, 22A, 22B, 23A, 23B, and 28A-28N**. This experiment was repeated with for IFNα fusion proteins using B16-Blue IFNα/β cells. The EC50 values for cleaved inducible mIFNα molecules were at least 100x more potent than un-cleaved inducible mIFNα molecules.

[283] B16-Blue IFN-α/β cells (InvivoGen) were plated in suspension at a density of 75,000 cells/well in culture media with or without 15 mg/ml mouse serum albumin (HSA) and stimulated with a dilution series of recombinant mouse IFNα (or IFNβ) and activatable mouse IFNα (or IFNβ) for 20-24 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved activatable IFNα (or IFNβ) was tested. Cleaved inducible IFNα (or IFNβ) was generated by incubation with active recombinant protease. Stimulation of B16-Blue IFN-α/β cells with IFNα (or IFNβ) induces expression of Secreted Alkaline Phosphatase (SEAP) from an ISRE-ISG54-SEAP reporter. IFNα (or IFNβ) activity was assessed by quantification of SEAP activity using the reagent QUANTI-Blue (InvivoGen), a colorimetric based assay. Results are shown in FIGs. 10A-10J.

Example 13. *In Vivo* Delivery of a Protease Activated Fusion Protein Results in Decreased Tumor Growth

[284] The chimeric polypeptide is examined to determine if it could have biological effects *in vivo*. For these experiments a system is used in which tumor cells injected intraperitoneally rapidly and preferentially attach and grow initially on the milky spots, a series of organized immune aggregates found on the omentum (Gerber et al., Am. J. Pathol. 169:1739-52 (2006)). This system offers a convenient way to examine the effects of fusion protein treatment on tumor growth since fusion proteins can be delivered intraperitoneally multiple times and tumor growth can be analyzed by examining the dissociated omental cells. For these experiments, the Colon 38 cell line, a rapidly growing tumor cell line that expresses both MMP2 and MMP9 *in vitro*, may be used. The omental tissue normally expresses a relatively small amount of MMP2 and MMP9, but, when Colon 38 tumor is present on the omentum, MMP levels increase. Using this tumor model, the ability of IFN fusion proteins to affect tumor growth is examined. Colon 38 cells are injected intraperitoneally, allowed to attach and grow for 1 day, and then treated daily with fusion protein interaperitoneally. At day 7, the animals are sacrificed and the omenta examined for tumor growth using flow cytometry and by a colony-forming assay.

Example 13b: The chimeric polypeptide was examined to determine its biological effects *in vivo*.

[285] The MC38 cell line, a rapidly growing colon adenocarcinoma cell line that expresses MMP9 *in vitro*, was used. Using this tumor model, the ability of IFNγ fusion proteins to affect tumor growth was examined. MC38 cells were injected subcutaneously, allowed to grow for 10-14 days, and then treated with fusion protein twice weekly intraperitoneally for a total of four doses, at the levels shown in **FIG. 21A-21C.** As a comparator, wild-type mIFNγ was administered at the dose levels indicated, twice daily for 2 weeks on a 5 day on/2 day off schedule (10 total doses). Tumor growth and body weight were monitored approximately twice per week for two weeks.

Example 14: Construction of an Exemplary IFNγ Protein Targeting CD20

Generation of an activatable cytokine domain

[286] An IFNγ polypeptide capable of binding to CD20 polypeptide present in a tumor or on a tumor cell is produced as follows. A nucleic acid is produced that contains nucleic acid sequences: (1) encoding an IFNγ polypeptide sequence and (2) one or more polypeptide linkers. Activatable IFNγ plasmid constructs can have optional Flag, His or other affinity tags, and are electroporated into HEK293 or other suitable human or mammalian cell lines and purified. Validation assays include T cell activation assays using T cells responsive to IFNγ stimulation in the presence of a protease.

Generation of a scFv CD20 binding domain

[287] CD20 is one of the cell surface proteins present on B-lymphocytes. CD20 antigen is found in normal and malignant pre-B and mature B lymphocytes, including those in over 90% of B-cell non-Hodgkin's lymphomas (NHL). The antigen is absent in hematopoietic stem cells, activated B lymphocytes (plasma cells) and normal tissue. As such, several antibodies mostly of murine origin have been described: 1F5, 2B8/C2B8, 2H7, and 1H4.

[288] Human or humanized anti-CD20 antibodies are therefore used to generate scFv sequences for CD20 binding domains of an activatable IFNγ protein. DNA sequences coding for human or humanized VL and VH domains are obtained, and the codons for the constructs are, optionally, optimized for expression in cells from Homo sapiens. The order in which the VL and VH domains appear in the scFv is varied (i.e., VL-VH, or VH-VL orientation), and three copies of the "G4S" (SEQ ID NO.: 449) or "G_4S" (SEQ ID NO.: 449) subunit $(G_4S)_3$ (SEQ ID NO.: 452) connect the variable domains to create the scFv domain. Anti-CD20 scFv plasmid constructs can have optional Flag, His or other affinity tags, and are electroporated into HEK293 or other suitable human or mammalian cell lines and purified. Validation assays include binding analysis by FACS, kinetic analysis using Proteon, and staining of CD20-expressing cells.

Cloning of DNA expression constructs encoding the activatable IFNγ protein

[289] The activatable IFNγ construct with protease cleavage site domains are used to construct an activatable IFNγ protein in combination with an anti-CD20 scFv domain and a serum half-life extension element (e.g., a HSA binding peptide or VH domain), with the domains organized. For expression of an activatable IFNγ protein in CHO cells, coding sequences of all protein domains are cloned into a mammalian expression vector system. In brief, gene sequences encoding the activatable IFNγ domain, serum half-life extension element, and CD20 binding domain along with peptide linkers L1 and L2 are separately synthesized and subcloned. The resulting constructs are then ligated together in the order of CD20 binding domain – L1 – IFNγ subunit 1– L2 – protease cleavage domain

– L3 – IFNγ subunit2 – L4 – anti-CD20 scFv – L5 – serum half-life extension element to yield a final construct. All expression constructs are designed to contain coding sequences for an N-terminal signal peptide and a C-terminal hexahistidine (6xHis)-tag (SEQ ID NO.: 354) to facilitate protein secretion and purification, respectively.

Expression of activatable IFNγ proteins in stably transfected CHO cells

[290] A CHO cell expression system (Flp-In®, Life Technologies), a derivative of CHO-K1 Chinese Hamster ovary cells (ATCC, CCL-61) (Kao and Puck, Proc. Natl. Acad Sci USA 1968;60(4):1275-81), is used. Adherent cells are subcultured according to standard cell culture protocols provided by Life Technologies.

[291] For adaption to growth in suspension, cells are detached from tissue culture flasks and placed in serum-free medium. Suspension-adapted cells are cryopreserved in medium with 10% DMSO.

[292] Recombinant CHO cell lines stably expressing secreted activatable IFNγ proteins are generated by transfection of suspension-adapted cells. During selection with the antibiotic Hygromycin B viable cell densities are measured twice a week, and cells are centrifuged and resuspended in fresh selection medium at a maximal density of 0.1×10^6 viable cells/mL. Cell pools stably expressing activatable IFNγ proteins are recovered after 2-3 weeks of selection at which point cells are transferred to standard culture medium in shake flasks. Expression of recombinant secreted proteins is confirmed by performing protein gel electrophoresis or flow cytometry. Stable cell pools are cryopreserved in DMSO containing medium.

[293] Activatable IFNγ proteins are produced in 10-day fed-batch cultures of stably transfected CHO cell lines by secretion into the cell culture supernatant. Cell culture supernatants are harvested after 10 days at culture viabilities of typically >75%. Samples are collected from the production cultures every other day and cell density and viability are assessed. On day of harvest, cell culture supernatants are cleared by centrifugation and vacuum filtration before further use.

[294] Protein expression titers and product integrity in cell culture supernatants are analyzed by SDS-PAGE.

Purification of activatable IFNγ proteins

[295] Activatable IFNγ proteins are purified from CHO cell culture supernatants in a two-step procedure. The constructs are subjected to affinity chromatography in a first step followed by preparative size exclusion chromatography (SEC) on Superdex 200 in a second step. Samples are buffer-exchanged and concentrated by ultrafiltration to a typical concentration of >1 mg/mL. Purity and homogeneity (typically >90%) of final samples are assessed by SDS PAGE under reducing and non-reducing conditions, followed by immunoblotting using an anti-HSA or anti idiotype antibody as well as by analytical SEC, respectively. Purified proteins are stored at aliquots at -80°C until use.

Example 15: Determination of antigen affinity by flow cytometry

[296] The activatable IFNγ proteins of Example 1 are tested for their binding affinities to human $CD20^+$ cells and cynomolgus $CD20^+$ cells.

[297] $CD20^+$ cells are incubated with 100 µL of serial dilutions of the activatable IFNγ proteins of Example 1 and at least one protease. After washing three times with FACS buffer the cells are incubated with 0.1 mL of 10 µg/mL mouse monoclonal anti-idiotype antibody in the same buffer for 45 min on ice. After a second washing cycle, the cells are incubated with 0.1 mL of 15 µg/mL FITC-conjugated goat anti-mouse IgG antibodies under the same conditions as before. As a control, cells are incubated with the anti-His IgG followed by the FITC-conjugated goat anti-mouse IgG antibodies without the activatable IFNγproteins. The cells were then washed again and resuspended in 0.2 mL of FACS buffer containing 2 µg/mL propidium iodide (PI) in order to exclude dead cells. The fluorescence of $1x10^4$ living cells is measured using a Beckman-Coulter FC500 MPL flow cytometer using the MXP software (Beckman-Coulter, Krefeld, Germany) or a Millipore Guava EasyCyte flow cytometer using the Incyte software (Merck Millipore, Schwalbach, Germany). Mean fluorescence intensities of the cell samples are calculated using CXP software (Beckman-Coulter, Krefeld, Germany) or Incyte software (Merck Millipore, Schwalbach, Germany). After subtracting the fluorescence intensity values of the cells stained with the secondary and tertiary reagents alone the values are then used for calculation of the K_D values with the equation for one-site binding (hyperbola) of the GraphPad Prism (version 6.00 for Windows, GraphPad Software, La Jolla California USA).

[298] CD20 binding and crossreactivity are assessed on the human $CD20^+$ tumor cell lines. The K_D ratio of crossreactivity is calculated using the K_D values determined on the CHO cell lines expressing either recombinant human or recombinant cynomolgus antigens.

Example 16: Cytotoxicity Assay

[299] The activatable IFNγ protein of Example 5 is evaluated *in vitro* on its mediation of immune response to $CD20^+$ target cells.

[300] Fluorescence labeled $CD20^+$ REC-1 cells (a Mantle cell lymphoma cell line, ATCC CRL-3004) are incubated with isolated PBMC of random donors or CB15 T-cells (standardized T-cell line) as effector cells in the presence of the activatable IFNγ protein of Example 5 and at least one protease. After incubation for 4 h at 37°C in a humidified incubator, the release of the fluorescent dye from the target cells into the supernatant is determined in a spectrofluorimeter. Target cells incubated without the activatable IFNγ protein of Example 5 and target cells totally lysed by the addition of saponin at the end of the incubation serve as negative and positive controls, respectively.

[301] Based on the measured remaining living target cells, the percentage of specific cell lysis is

calculated according to the following formula: [1-(number of living targets$_{(sample)}$/number of living targets$_{(spontaneous)}$)] x 100%. Sigmoidal dose response curves and EC_{50} values are calculated by non-linear regression/4-parameter logistic fit using the GraphPad Software. The lysis values obtained for a given antibody concentration are used to calculate sigmoidal dose-response curves by 4 parameter logistic fit analysis using the Prism software.

Example 17: Pharmacokinetics of activatable IFNγ Proteins

[302] The activatable IFNγ protein of Example 5 is evaluated for half-time elimination in animal studies.

[303] The activatable IFNγ protein is administered to cynomolgus monkeys as a 0.5 mg/kg bolus injection into the saphenous vein. Another cynomolgus monkey group receives a comparable cytokine in size, but lacking a serum half-life extension element. A third and fourth group receive a cytokine with serum half-life extension elements and a cytokine with CD20 and serum half-life extension elements respectively, and both comparable in size to the activatable IFNγ protein. Each test group consists of 5 monkeys. Serum samples are taken at indicated time points, serially diluted, and the concentration of the proteins is determined using a binding ELISA to CD20.

[304] Pharmacokinetic analysis is performed using the test article plasma concentrations. Group mean plasma data for each test article conforms to a multi-exponential profile when plotted against the time post-dosing. The data are fit by a standard two-compartment model with bolus input and first-order rate constants for distribution and elimination phases. The general equation for the best fit of the data for i.v. administration is: $c(t)=Ae^{-\alpha t}+Be^{-\beta t}$, where c(t) is the plasma concentration at time t, A and B are intercepts on the Y-axis, and α and β are the apparent first-order rate constants for the distribution and elimination phases, respectively. The α-phase is the initial phase of the clearance and reflects distribution of the protein into all extracellular fluid of the animal, whereas the second or β-phase portion of the decay curve represents true plasma clearance. Methods for fitting such equations are well known in the art. For example, $A=D/V(\alpha-k21)/(\alpha-\beta)$, $B=D/V(\beta-k21)/(\alpha-\beta)$, and α and β (for $\alpha>\beta$) are roots of the quadratic equation: $r^2+(k12+k21+k10)r+k21k10=0$ using estimated parameters of V=volume of distribution, k10=elimination rate, k12=transfer rate from compartment 1 to compartment 2 and k21=transfer rate from compartment 2 to compartment 1, and D=the administered dose.

[305] Data analysis: Graphs of concentration versus time profiles are made using KaleidaGraph (KaleidaGraph™ V. 3.09 Copyright 1986-1997. Synergy Software. Reading, Pa.). Values reported as less than reportable (LTR) are not included in the PK analysis and are not represented graphically. Pharmacokinetic parameters are determined by compartmental analysis using WinNonlin software (WinNonlin® Professional V. 3.1 WinNonlin™ Copyright 1998-1999. Pharsight Corporation. Mountain View, Calif.). Pharmacokinetic parameters are computed as described in Ritschel W A and

Kearns G L, 1999, IN: *Handbook Of Basic Pharmacokinetics Including Clinical Applications,* 5th edition, American Pharmaceutical Assoc., Washington, D.C.

[306] It is expected that the activatable IFNγ protein of Example 5 has improved pharmacokinetic parameters such as an increase in elimination half-time as compared to proteins lacking a serum half-life extension element.

Example 18: Xenograft Tumor Model

[307] The activatable IFNγ protein of Example 5 is evaluated in a xenograft model.

[308] Female immune-deficient NOD/scid mice are sub-lethally irradiated (2 Gy) and subcutaneously inoculated with $4x10^6$ Ramos RA1 cells into the right dorsal flank. When tumors reach 100 to 200 mm^3, animals are allocated into 3 treatment groups. Groups 2 and 3 (8 animals each) are intraperitoneally injected with $1.5x10^7$ activated human T-cells. Three days later, animals from Group 3 are subsequently treated with a total of 9 intravenous doses of 50 µg activatable IFNγ protein of Example 5 (qdx9d). Groups 1 and 2 are only treated with vehicle. Body weight and tumor volume are determined for 30 days.

[309] It is expected that animals treated with the activatable IFNγ protein of Example 5 have a statistically significant delay in tumor growth in comparison to the respective vehicle-treated control group.

[310] While preferred embodiments of the present invention have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

Example 19: HEK-Blue assay

[311] HEK-Blue IL12 cells (InvivoGen) were plated in suspension at a concentration of 50,000 cells/well in culture media with or without 15 or 40mg/ml human serum albumin (HSA) and stimulated with a dilution series of recombinant hIL12, chimeric IL12 (mouse p35/human p40) or activatable hIL12 for 20-24 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved activatable hIL12 was tested. Cleaved inducible hIL12 was generated by incubation with active MMP9. IL12 activity was assessed by quantification of Secreted Alkaline Phosphatase (SEAP) activity using the reagent QUANTI-Blue (InvivoGen), a colorimetric based assay. Results are shown in **FIGs. 7A-7Q, 11A-11B, 12A-12F, 15A-15D, and 26A-26D.**

[312] HEK-Blue IL2 cells (InvivoGen) were plated in suspension at a concentration of 50,000 cells/well in culture media with or without 15-40 mg/ml human serum albumin (HSA) and stimulated with a dilution series of recombinant hIL2 or activatable hIL2 for 24 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved activatable hIL2 was tested. Cleaved inducible hIL2 was generated by incubation with active MMP9. IL12 activity was assessed by quantification of Secreted Alkaline Phosphatase (SEAP) activity using the reagent QUANTI-Blue (InvivoGen), a colorimetric based assay. Exemplary results are shown in **FIGs. 1A-1F and FIGs. 24A-24D.**

[313] HEK-Blue IFN-a/b cells (InvivoGen) were plated in suspension at a density of 50,000 cells/well in culture media with or without 15 mg/ml human serum albumin (HSA) and stimulated with a dilution series of recombinant human IFNa (or IFNb) and activatable human IFNa (or IFNb) for 20-24 hours at 37oC and 5% CO2. Activity of uncleaved and cleaved activatable IFNa (or IFNb) was tested. Cleaved inducible IFNa (or IFNb) was generated by incubation with active recombinant protease. Stimulation of HEK-Blue IFN-α/β cells with IFNα (or IFNβ) induces expression of Secreted Alkaline Phosphatase (SEAP) from an ISG54-SEAP reporter. IFNα (or IFNβ) activity was assessed by quantification of SEAP activity using the reagent QUANTI-Blue (InvivoGen), a colorimetric based assay. Results are shown in **FIGs. 36A-36H.**

Example 20: Splenocyte T-Blast assay

[314] T-Blasts were induced from murine splenocytes with a 6-day incubation with PHA and a 24hr incubation with recombinant hIL12. Tblasts were then plated in suspension at a concentration of 200,000 cells/well in culture media with or without 40mg/ml human serum albumin (HSA) and stimulated with a dilution series of recombinant hIL12 or chimeric IL12 (mouse p35/human p40) or mouse IL12 for 72 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved IL12 fusion proteins was tested. Cleaved inducible hIL12 was generated by incubation with active MMP9. IL12 activity was assessed by downstream quantification of IFNγ production using a mIFNγ alpha ELISA.

Example 21: *In Vivo* Delivery of a Protease Activated Fusion Protein Results in Decreased Tumor Growth

[315] The chimeric polypeptide is examined to determine if it could have biological effects *in vivo*. For these experiments a system is used in which tumor cells injected intraperitoneally rapidly and preferentially attach and grow initially on the milky spots, a series of organized immune aggregates found on the omentum (Gerber et al., Am. J. Pathol. 169:1739-52 (2006)). This system offers a convenient way to examine the effects of fusion protein treatment on tumor growth since fusion proteins can be delivered intraperitoneally multiple times and tumor growth can be analyzed by examining the dissociated omental cells. For these experiments, the Colon 38 cell line, a rapidly growing tumor cell line that expresses both MMP2 and MMP9 *in vitro*, may be used. The omental

tissue normally expresses a relatively small amount of MMP2 and MMP9, but, when Colon 38 tumor is present on the omentum, MMP levels increase. Using this tumor model, the ability of IL-2 mutein fusion proteins to affect tumor growth is examined. Colon 38 cells are injected intraperitoneally, allowed to attach and grow for 1 day, and then treated daily with fusion protein interaperitoneally. At day 7, the animals are sacrificed and the omenta examined for tumor growth using flow cytometry and by a colony-forming assay.

Example 22: Construction of an Exemplary Activatable Interleukin Protein Targeting CD20

Generation of an activatable interleukin domain

[316] The human IL-12p35 chain canonical sequence is Uniprot Accession No. P29459. The human IL-12p40 chain canonical sequence is Uniprot Accession No. P29460. IL-12p35 and IL-12p40 are cloned into an expression construct. A protease cleavage site is included between the IL-12p35 and IL-12p40 domains. An IL-12 polypeptide capable of binding to CD20 polypeptide present in a tumor or on a tumor cell is produced as follows. A nucleic acid is produced that contains nucleic acid sequences: (1) encoding an IFNγ polypeptide sequence and (2) one or more polypeptide linkers. Activatable interleukin plasmid constructs can have optional Flag, His or other affinity tags, and are electroporated into HEK293 or other suitable human or mammalian cell lines and purified. Validation assays include T cell activation assays using T cells responsive to IL-12 stimulation in the presence of a protease.

Generation of a scFv CD20 binding domain

[317] CD20 is one of the cell surface proteins present on B-lymphocytes. CD20 antigen is found in normal and malignant pre-B and mature B lymphocytes, including those in over 90% of B-cell non-Hodgkin's lymphomas (NHL). The antigen is absent in hematopoietic stem cells, activated B lymphocytes (plasma cells) and normal tissue. As such, several antibodies mostly of murine origin have been described: 1F5, 2B8/C2B8, 2H7, and 1H4.

[318] Human or humanized anti-CD20 antibodies are therefore used to generate scFv sequences for CD20 binding domains of an activatable interleukin protein. DNA sequences coding for human or humanized VL and VH domains are obtained, and the codons for the constructs are, optionally, optimized for expression in cells from Homo sapiens. The order in which the VL and VH domains appear in the scFv is varied (i.e., VL-VH, or VH-VL orientation), and three copies of the "G4S" (SEQ ID NO.: 449) or "G_4S" (SEQ ID NO.: 449) subunit $(G_4S)_3$ (SEQ ID NO.: 452) connect the variable domains to create the scFv domain. Anti-CD20 scFv plasmid constructs can have optional Flag, His or other affinity tags, and are electroporated into HEK293 or other suitable human or mammalian cell lines and purified. Validation assays include binding analysis by FACS, kinetic analysis using Proteon, and staining of CD20-expressing cells.

Cloning of DNA expression constructs encoding the activatable interleukin protein

[319] The activatable interleukin construct with protease cleavage site domains are used to construct an activatable interleukin protein in combination with an anti-CD20 scFv domain and a serum half-life extension element (e.g., a HSA binding peptide or VH domain). For expression of an activatable interleukin protein in CHO cells, coding sequences of all protein domains are cloned into a mammalian expression vector system. In brief, gene sequences encoding the activatable interleukin domain, serum half-life extension element, and CD20 binding domain along with peptide linkers L1 and L2 are separately synthesized and subcloned. The resulting constructs are then ligated together in the order of CD20 binding domain – L1 – IL-12p35– L2 – protease cleavage domain – L3 – IL-12p40 – L4 – anti-CD20 scFv – L5 – serum half-life extension element to yield a final construct. All expression constructs are designed to contain coding sequences for an N-terminal signal peptide and a C-terminal hexahistidine (6xHis)-tag (SEQ ID NO.: 354) to facilitate protein secretion and purification, respectively.

Expression of activatable interleukin proteins in stably transfected CHO cells

[320] A CHO cell expression system (Flp-In®, Life Technologies), a derivative of CHO-K1 Chinese Hamster ovary cells (ATCC, CCL-61) (Kao and Puck, Proc. Natl. Acad Sci USA 1968;60(4):1275-81), is used. Adherent cells are subcultured according to standard cell culture protocols provided by Life Technologies.

[321] For adaption to growth in suspension, cells are detached from tissue culture flasks and placed in serum-free medium. Suspension-adapted cells are cryopreserved in medium with 10% DMSO.

[322] Recombinant CHO cell lines stably expressing secreted activatable interleukin proteins are generated by transfection of suspension-adapted cells. During selection with the antibiotic Hygromycin B viable cell densities are measured twice a week, and cells are centrifuged and resuspended in fresh selection medium at a maximal density of $0.1x10^6$ viable cells/mL. Cell pools stably expressing activatable interleukin proteins are recovered after 2-3 weeks of selection at which point cells are transferred to standard culture medium in shake flasks. Expression of recombinant secreted proteins is confirmed by performing protein gel electrophoresis or flow cytometry. Stable cell pools are cryopreserved in DMSO containing medium.

[323] Activatable interleukin proteins are produced in 10-day fed-batch cultures of stably transfected CHO cell lines by secretion into the cell culture supernatant. Cell culture supernatants are harvested after 10 days at culture viabilities of typically >75%. Samples are collected from the production cultures every other day and cell density and viability are assessed. On day of harvest, cell culture supernatants are cleared by centrifugation and vacuum filtration before further use.

[324] Protein expression titers and product integrity in cell culture supernatants are analyzed by SDS-PAGE.

Purification of activatable interleukin proteins

[325] Activatable interleukin proteins are purified from CHO cell culture supernatants in a two-step procedure. The constructs are subjected to affinity chromatography in a first step followed by preparative size exclusion chromatography (SEC) on Superdex 200 in a second step. Samples are buffer-exchanged and concentrated by ultrafiltration to a typical concentration of >1 mg/mL. Purity and homogeneity (typically >90%) of final samples are assessed by SDS PAGE under reducing and non-reducing conditions, followed by immunoblotting using an anti-HSA or anti idiotype antibody as well as by analytical SEC, respectively. Purified proteins are stored at aliquots at -80°C until use.

Example 23: Determination of antigen affinity by flow cytometry

[326] The activatable interleukin proteins of Example 5 are tested for their binding affinities to human $CD20^+$ cells and cynomolgus $CD20^+$ cells.

[327] $CD20^+$ cells are incubated with 100 µL of serial dilutions of the activatable interleukin proteins of Example 5 and at least one protease. After washing three times with FACS buffer the cells are incubated with 0.1 mL of 10 µg/mL mouse monoclonal anti-idiotype antibody in the same buffer for 45 min on ice. After a second washing cycle, the cells are incubated with 0.1 mL of 15 µg/mL FITC-conjugated goat anti-mouse IgG antibodies under the same conditions as before. As a control, cells are incubated with the anti-His IgG followed by the FITC-conjugated goat anti-mouse IgG antibodies without the activatable interleukin proteins. The cells were then washed again and resuspended in 0.2 mL of FACS buffer containing 2 µg/mL propidium iodide (PI) in order to exclude dead cells. The fluorescence of $1x10^4$ living cells is measured using a Beckman-Coulter FC500 MPL flow cytometer using the MXP software (Beckman-Coulter, Krefeld, Germany) or a Millipore Guava EasyCyte flow cytometer using the Incyte software (Merck Millipore, Schwalbach, Germany). Mean fluorescence intensities of the cell samples are calculated using CXP software (Beckman-Coulter, Krefeld, Germany) or Incyte software (Merck Millipore, Schwalbach, Germany). After subtracting the fluorescence intensity values of the cells stained with the secondary and tertiary reagents alone the values are then used for calculation of the K_D values with the equation for one-site binding (hyperbola) of the GraphPad Prism (version 6.00 for Windows, GraphPad Software, La Jolla California USA).

[328] CD20 binding and crossreactivity are assessed on the human $CD20^+$ tumor cell lines. The K_D ratio of crossreactivity is calculated using the K_D values determined on the CHO cell lines expressing either recombinant human or recombinant cynomolgus antigens.

Example 24: Cytotoxicity Assay

[329] The activatable interleukin protein of Example 5 is evaluated *in vitro* on its mediation of immune response to $CD20^+$ target cells.

[330] Fluorescence labeled $CD20^+$ REC-1 cells (a Mantle cell lymphoma cell line, ATCC CRL-3004) are incubated with isolated PBMC of random donors or CB15 T-cells (standardized T-cell line) as effector cells in the presence of the activatable interleukin protein of Example 5 and at least one protease. After incubation for 4 h at 37°C in a humidified incubator, the release of the fluorescent dye from the target cells into the supernatant is determined in a spectrofluorimeter. Target cells incubated without the activatable interleukin protein of Example 5and target cells totally lysed by the addition of saponin at the end of the incubation serve as negative and positive controls, respectively.

[331] Based on the measured remaining living target cells, the percentage of specific cell lysis is calculated according to the following formula: [1-(number of living $targets_{(sample)}$/number of living $targets_{(spontaneous)}$)] x 100%. Sigmoidal dose response curves and EC_{50} values are calculated by non-linear regression/4-parameter logistic fit using the GraphPad Software. The lysis values obtained for a given antibody concentration are used to calculate sigmoidal dose-response curves by 4 parameter logistic fit analysis using the Prism software.

Example 25: Pharmacokinetics of activatable interleukin Proteins

[332] The activatable interleukin protein of Example 5 is evaluated for half-time elimination in animal studies.

[333] The activatable interleukin protein is administered to cynomolgus monkeys as a 0.5 mg/kg bolus injection into the saphenous vein. Another cynomolgus monkey group receives a comparable cytokine in size, but lacking a serum half-life extension element. A third and fourth group receive a cytokine with serum half-life extension elements and a cytokine with CD20 and serum half-life extension elements respectively, and both comparable in size to the activatable interleukin protein. Each test group consists of 5 monkeys. Serum samples are taken at indicated time points, serially diluted, and the concentration of the proteins is determined using a binding ELISA to CD20.

[334] Pharmacokinetic analysis is performed using the test article plasma concentrations. Group mean plasma data for each test article conforms to a multi-exponential profile when plotted against the time post-dosing. The data are fit by a standard two-compartment model with bolus input and first-order rate constants for distribution and elimination phases. The general equation for the best fit of the data for i.v. administration is: $c(t)=Ae^{-\alpha t}+Be^{-\beta t}$, where c(t) is the plasma concentration at time t, A and B are intercepts on the Y-axis, and α and β are the apparent first-order rate constants for the distribution and elimination phases, respectively. The α-phase is the initial phase of the clearance and reflects distribution of the protein into all extracellular fluid of the animal, whereas the second or β-phase portion of the decay curve represents true plasma clearance. Methods for fitting such equations

are well known in the art. For example, A=D/V(α–k21)/(α–β), B=D/V(β–k21)/(α–β), and α and β (for α>β) are roots of the quadratic equation: r^2+(k12+k21+k10)r+k21k10=0 using estimated parameters of V=volume of distribution, k10=elimination rate, k12=transfer rate from compartment 1 to compartment 2 and k21=transfer rate from compartment 2 to compartment 1, and D=the administered dose.

[335] Data analysis: Graphs of concentration versus time profiles are made using KaleidaGraph (KaleidaGraph™ V. 3.09 Copyright 1986-1997. Synergy Software. Reading, Pa.). Values reported as less than reportable (LTR) are not included in the PK analysis and are not represented graphically. Pharmacokinetic parameters are determined by compartmental analysis using WinNonlin software (WinNonlin® Professional V. 3.1 WinNonlin™ Copyright 1998-1999. Pharsight Corporation. Mountain View, Calif.). Pharmacokinetic parameters are computed as described in Ritschel W A and Kearns G L, 1999, IN: *Handbook Of Basic Pharmacokinetics Including Clinical Applications,* 5th edition, American Pharmaceutical Assoc., Washington, D.C.

[336] It is expected that the activatable interleukin protein of Example 5 has improved pharmacokinetic parameters such as an increase in elimination half-time as compared to proteins lacking a serum half-life extension element.

Example 26: Xenograft Tumor Model

[337] The activatable interleukin protein of Example 5 is evaluated in a xenograft model.

[338] Female immune-deficient NOD/scid mice are sub-lethally irradiated (2 Gy) and subcutaneously inoculated with $4x10^6$ Ramos RA1 cells into the right dorsal flank. When tumors reach 100 to 200 mm^3, animals are allocated into 3 treatment groups. Groups 2 and 3 (8 animals each) are intraperitoneally injected with $1.5x10^7$ activated human T-cells. Three days later, animals from Group 3 are subsequently treated with a total of 9 intravenous doses of 50 µg activatable interleukin protein of Example 5 (qdx9d). Groups 1 and 2 are only treated with vehicle. Body weight and tumor volume are determined for 30 days.

[339] It is expected that animals treated with the activatable interleukin protein of Example 5 have a statistically significant delay in tumor growth in comparison to the respective vehicle-treated control group.

[340] While preferred embodiments of the present invention have been shown and described herein, it will be obvious to those skilled in the art that such embodiments are provided by way of example only. Numerous variations, changes, and substitutions will now occur to those skilled in the art without departing from the invention. It should be understood that various alternatives to the embodiments of the invention described herein may be employed in practicing the invention. It is intended that the following claims define the scope of the invention and that methods and structures within the scope of these claims and their equivalents be covered thereby.

Example 27: MC38 experiments

[341] The MC38 cell line, a rapidly growing colon adenocarcinoma cell line that expresses MMP9 *in vitro*, was used. Using this tumor model, the ability of fusion proteins to affect tumor growth was examined.

Example 27a: MC38 IL-2POC

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	10	Vehicle	-	ip	biwk x 3
2	7	ACP16	700µg/animal	ip	biwk x 3
3	7	ACP16	230µg/animal	ip	biwk x 3
4	7	ACP16	70µg/animal	ip	biwk x 3
5	7	ACP16	55ug/animal	ip	biwk x 3
6	7	ACP16	17µg/animal	ip	biwk x 3
7	7	ACP132	361 µg/animal	ip	biwk x 3
8	7	ACP132	119µg/animal	ip	biwk x 3
9	7	ACP132	36 µg/animal	ip	biwk x 3
10	7	ACP132	28µg/animal	ip	biwk x 3
11	7	ACP132	9 µg/animal	ip	biwk x 3
12	7	ACP21	540µg/animal	ip	biwk x 3
13	7	ACP21	177µg/animal	ip	biwk x 3
14	7	ACP21	54µg/animal	ip	biwk x 3
15	7	ACP21	42µg/animal	ip	biwk x 3
16	7	ACP21	13µg/animal	ip	biwk x 3
#	- ControlGroup				

Procedures:

[342] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. 308 CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks. Pair matches were

performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized.

[343] Results are shown in **FIG. 35.**

Example 27b: MC38 IL-2 POC. Treatment with ACP16, ACP124 and ACP130

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	12	Vehicle	-	ip	biwk x 2
2	8	ACP16	4.4 µg/animal	ip	biwk x 2
3	8	ACP16	17 µg/animal	ip	biwk x 2
4	8	ACP16	70 µg/animal	ip	biwk x 2
5	8	ACP16	232 µg/animal	ip	biwk x 2
6	8	ACP130	19 µg/animal	ip	biwk x 2
7	8	ACP130	45 µg/animal	ip	biwk x 2
8	8	ACP130	180 µg/animal	ip	biwk x 2
9	8	ACP130	600 µg/animal	ip	biwk x 1
12	8	ACP124	17 µg/animal	ip	biwk x 2
13	8	ACP124	70 µg/animal	ip	biwk x 2
14	8	ACP124	230 µg/animal	ip	biwk x 2
15	8	ACP124	700 µg/animal	ip	biwk x 2
16	8	IL-2-WTI	12 µg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause

17	8	IL-2-WTI	36 µg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause
#	- Control Group				

Procedures:

[344] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. 308 CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks.Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized.

Results are shown in FIG. 31A-31C and FIG. 32B-32C. Survival curves are shown in FIGs. 34A-34D.

Example 27c: MC38 IFNa and IL-12

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	12	Vehicle	-	ip	biwk x 3
2	8	ACP11	17.5 µg/animal	ip	biwk x 3
3	8	ACP11	175 µg/animal	ip	biwk x 3
4	8	ACP11	525 µg/animal	ip	biwk x 3
5	8	ACP31	33 µg/animal	ip	biwk x 3
6	8	ACP31	110 µg/animal	ip	biwk x 3
7	8	ACP31	330 µg/animal	ip	biwk x 3

8	8	ACP131	1 μg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause
9	8	ACP131	10 μg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause
10	8	ACP131	30 μg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause
11	8	mIFNa1-WTI	1 μg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause
12	8	mIFNa1-WTI	10 μg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause
13	8	IL-12-HM-WTI	2 μg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause
14	8	IL-12-HM-WTI	10 μg/animal	ip	bid x 5 then 2-day pause then bid x 5 then 2-day pause
15	8	ACP131	5 μg/animal	itu	bid x 5 then 2-day pause then bid x 5 then 2-day pause
#	- Control Group				

Procedures:

[345] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. 308 CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks.Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery

were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized. Results are show in in FIGs. 29A-29B, and 30.

Example 27d: Treatment with ACP16, ACP132, and ACP21

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	10	Vehicle	-	ip	biwk x 2
2	7	ACP16	17 µg/animal	ip	biwk x 2
3	7	ACP16	55 µg/animal	ip	biwk x 2
4	7	ACP16	70 µg/animal	ip	biwk x 2
5	7	ACP16	230 µg/animal	ip	biwk x 2
6	7	ACP132	9 µg/animal	ip	biwk x 2
7	7	ACP132	28 µg/animal	ip	biwk x 1
8	7	ACP132	36 µg/animal	ip	biwk x 1
9	7	ACP132	119 µg/animal	ip	biwk x 1
10	7	ACP21	13 µg/animal	ip	biwk x 2
11	7	ACP21	42 µg/animal	ip	biwk x 2
12	7	ACP21	54 µg/animal	ip	biwk x 2
13	7	ACP21	177 µg/animal	ip	biwk x 2

Procedures:

[346] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks.Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment.ACP16 was dosed at 17, 55, 70, or 230 µg/animal; ACP132 was dosed at 9, 28, 36, or 119ug/animal; ACP21 was dosed at 13, 42, 54, or 177µg/animal. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and

recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized. Results are shown in FIG. 35.

Example 27e: MC38 rechallenge

[347] Cured mice (ACP16-treated) from Example 27b were rechallenged with tumor implantation to determine whether anti-tumor memory had been established from the initial treatments.

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	33	No Treatment	-	-	-
2	7	ACP16	70 µg/animal	ip	(ACP16 biwkx2)
3	8	ACP16	232 µg/animal	ip	(ACP16 biwkx2)
5	5	IL-2-WTI	12 µg/animal	ip	(IL-2-WTI bid x 5 then 2-day pause then bid x 5 then 2-day pause)
6	7	IL-2-WTI	36 µg/animal	ip	(IL-2-WTI bid x 5 then 2-day pause then bid x 5 then 2-day pause)
#	- Control Group				

Procedures:

[348] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. This portion of the study began on the day of implant (Day 1). Group 1 consisted of 33 CR female C57BL/6 mice set up with $5x10^5$ MC38 tumor cells in 0% Matrigel subcutaneously in the flank. Groups 2-6 consisted of 33 CR female C57BL/6 mice set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in the left flank. The tumors from the previous MC38 experiment (Example 27b) were implanted in the right flank of each animal. Cell Injection Volume was 0.1 mL/mouse. Age of control

mice at initiation was14 to 17 weeks. These mice were age matched to mice from the previous MC38 experiment (Example 27b). No dosing of active agent occurred during rechallenge. Body Weights were take biweekly until end, as were caliper measurements. Any adverse reactions or death were reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1000 mm^3 or 45 days, whichever comes first. Responders were followed longer when possible. When the endpoint is reached, the animals were euthanized. Results are shown in FIG. 33.

Example 27f: Treatment with ACP10, ACP11

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	12	Vehicle	-	ip	biwk x 2
2	8	ACP11	175 µg/animal	ip	biwk x 2
3	8	ACP11	300 µg/animal	ip	biwk x 2
4	8	ACP10	5 µg/animal	ip	biwk x 2
5	8	ACP10	10 µg/animal	ip	biwk x 2
6	8	ACP10	43 µg/animal	ip	biwk x 2
7	8	ACP10	43 µg/animal	ip	qwk x 2
8	8	ACP10	172 µg/animal	ip	biwk x 2
9	8	IL-12-HM-WTI	5 µg/animal	ip	bid for 5 days first day 1 dose then 2-day pause then bid for 5 days first day 1 dose then 2-day pause
10	8	IL-12-HM-WTI	20 µg/animal	ip	bid for 5 days first day 1 dose then 2-day pause then bid for 5 days first day 1 dose then 2-day pause

Procedures:

[349] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks. Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment.ACP11 was dosed at 175 or 300 µg/animal; ACP10 was dosed at 5, 10, 43, or 172 ug/animal; IL-12-HM-WTI was dosed at 5 or 20 ug/animal. Body weights were taken at initiation and then biweekly to the end.

Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized. Results are shown in FIG. 45 and FIGs. 46A–46D.

Example 27g: Treatment with ACP16, APC153, ACP155, ACP156 and ACP292

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	12	Vehicle	-	ip	biwk x 2
2	8	ACP16	17 µg/animal	ip	biwk x 2
3	8	ACP16	55 µg/animal	ip	biwk x 2
4	8	ACP16	230 µg/animal	ip	biwk x 2
5	8	ACP155	55 µg/animal	ip	biwk x 2
6	8	ACP155	230 µg/animal	ip	biwk x 2
7	8	ACP153	55 µg/animal	ip	biwk x 2
8	8	ACP153	230 µg/animal	ip	biwk x 2
9	8	ACP156	55 µg/animal	ip	biwk x 2
10	8	ACP156	230 µg/animal	ip	biwk x 2
11	8	ACP292	45 µg/animal	ip	biwk x 2
12	8	ACP292	186 µg/animal	ip	biwk x 2

Procedures:

[350] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks. Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment. ACP16 was

dosed at 17, 55 or 230 µg/animal; ACP153, ACP155 and ACP156 were dosed at 55 or 230 µg/animal; ACP292 was dosed at 45 or 186 µg/animal. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized. Results are shown in FIGs. 49A-49I.

Example 27h: Treatment with ACP16, APC302 and ACP314

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	12	Vehicle	-	ip	biwk x 2
2	9	ACP16	55 µg/animal	ip	biwk x 2
3	9	ACP16	230 µg/animal	ip	biwk x 2
4	9	ACP302	33 µg/animal	ip	biwk x 2
5	9	ACP302	106 µg/animal	ip	biwk x 2
6	9	ACP302	442 µg/animal	ip	biwk x 2
7	9	ACP302	1,344 µg/animal	ip	biwk x 2
8	9	ACP314	21 µg/animal	ip	biwk x 2
9	9	ACP314	68 µg/animal	ip	biwk x 2
10	9	ACP314	283 µg/animal	ip	biwk x 2
11	9	ACP314	861 µg/animal	ip	biwk x 2

Procedures:

[351] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks. Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment. ACP16 was

dosed at 55 or 230 µg/animal; ACP302 was dosed at 33, 106, 442 or 1344 ug/animal; ACP314 was dosed at 21,68, 283 or 861 µg/animal. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized. Results are shown in FIG. 50A-50B.

Example 27i: Treatment with ACP339

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	12	Vehicle	-	ip	biwk x 2
2	9	ACP339	55 µg/animal	ip	biwk x 2
3	9	ACP339	230 µg/animal	ip	biwk x 2
4	9	ACP339	700 µg/animal	ip	biwk x 2

Procedures:

[352] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks. Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment. ACP339 was dosed at 55, 230 or 700 µg/animal. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean

body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized. Results are shown in FIGs. 51A-51C.

Example 28: CT26 experiments

[353] The CT26 cell line, a rapidly growing colon adenocarcinoma cell line that expresses MMP9 *in vitro*, was used. Using this tumor model, the ability of fusion proteins to affect tumor growth was examined.

Example 28a: Treatment with ACP16 alone or in combination with anti-PD1 antibody

Agents and Treatment:

Gr.	N	Agent	Formulation dose	Route	Schedule
1#	12	vehicle 1 // vehicle 2	na // na	ip // ip	days 1,4,8,11 // days 3,6,10,13
2	10	vehicle 1 // ACP16	na // 70 µg/animal	ip // ip	days 1,4,8,11 // days 3,6,10,13
3	10	vehicle 1 // ACP16	na // 232 µg/animal	ip // ip	days 1,4,8,11 // days 3,6,10,13
4	10	vehicle 1 // ACP16	na // 500 µg/animal	ip // ip	days 1,4,8,11 // days 3,6,10,13
5	10	anti-PD-1 RMP1-14 // vehicle 2	200 µg/animal // na	ip // ip	days 1,4,8,11 // days 3,6,10,13
6	10	anti-PD-1 RMP1-14 // ACP16	200 µg/animal // 70 µg/animal	ip // ip	days 1,4,8,11 // days 3,6,10,13
7	10	anti-PD-1 RMP1-14 // ACP16	200 µg/animal // 232 µg/animal	ip // ip	days 1,4,8,11 // days 3,6,10,13
8	10	anti-PD-1 RMP1-14 // ACP16	200 µg/animal // 500 µg/animal	ip // ip	days 1,4,8,11 // days 3,6,10,13
9	10	vehicle 1 // IL-2	na // 12 µg/animal	ip // ip	days 1,4,8,11 // bid x 5 first day 1 dose per week x 2
10	10	anti-PD-1 RMP1-14 // IL-2	200 µg/animal // 12 µg/animal	ip // ip	days 1,4,8,11 // bid x 5 first day 1 dose per week x 2

Procedures:

[354] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. CR female BALB/c mice were set up with $3x10^5$ CT26 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks. Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment. ACP16 was dosed at 70, 230 or 500 µg/animal with or without anti-PD-1 antibody (RMP1-14) at 200 µg/animal. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized. Results are shown in FIGs. 47A-47D and FIGs. 48A-48B.

Example 29. Human Tblast Assay

[355] **IL-2 T-Blast Assay**. Pre-stimulated T cells (T-blasts) were used to assess the activity of inducible IL-2 fusion proteins. T-Blasts were induced from human PBMCs with a 3-day incubation with PHA. Tblasts were then plated in suspension at a concentration of 50,000 or 75,000 cells/well in X-VIVO culture media (containing human serum albumin) and stimulated with a dilution series of recombinant IL-2 fusion proteins or human IL-2 for 72 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved IL-2 fusion proteins was tested. Cleaved inducible IL-2 was generated by incubation with active MMP9. IL-2 activity was assessed measuring proliferation with CellTiter-Glo. Exemplary results are shown in FIG. 3A-3I.

[356] **IL-12 T-Blast Assay**. T-Blasts were induced from human PBMCs through PHA stimulation for 72 hours. T-blasts were then washed and frozen prior use. For the assay, T-Blasts were thaw and plated in suspension at 100,000 cells/well in culture media containing human albumin and stimulated with a dilution series of recombinant hIL12 or chimeric IL12 (mouse p35/human p40) indukines or hIL12 indukines for 72 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved IL12 fusion proteins was tested. Cleaved inducible hIL12 was generated by incubation with active MMP9

enzyme. IL12 activity was assessed by quantification of IFNγ production in supernatants using a hIFNγ Alpha-LISA kit. Exemplary results are shown in FIGs. 8A-8D.

Example 30. Luciferase Reporter Assay

[357] IL-2 luciferase reporter cells (Promega), purchased from the manufacturer in a "Thaw and Use" format, were plated according to the manufacturer's directions and stimulated with a dilution series of recombinant hIL-2 or activatable hIL-2 for 6 hours at 37oC and 5% CO2. Activity of uncleaved and cleaved activatable IL-2 was tested. Cleaved inducible IL-2 was generated by incubation with active MMP9. IL-2 activity was assessed by quantification of luciferase activity using Bio-Glo™ Reagent (Promega), which allows for the measurement of luciferase activity by luminescence readout. Results are shown in FIGS. 2A-2J.

[358] IL12 luciferase reporter cells (Promega), purchased from the manufacturer in a "Thaw and Use" format, were plated according to the manufacturer's directions and stimulated with a dilution series of recombinant hIL12 or activatable hIL12 for 6 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved activatable IL12 was tested. Cleaved inducible IL12 was generated by incubation with active MMP9. IL12 activity was assessed by quantification of luciferase activity using Bio-Glo™ Reagent (Promega), which allows for the measurement of luciferase activity by luminescence readout. Results are shown in FIGs. 9A-9C.

Example 31. MC38 Experiments

[359] Agents and Treatment

Group	N	Agent	Dose	Route	Schedule
1	12	vehicle	-	ip	biwk x 2
2	8	WW0417	55 µg/animal	ip	biwk x 2
3	8	WW0517	55 µg/animal	ip	biwk x 2
4	8	WW0517	230 µg/animal	ip	biwk x 2
5	8	WW0517	700 µg/animal	ip	biwk x 2
6	8	WWW0520/0523	76 µg/animal	ip	biwk x 2
7	8	WWW0520/0523	315 µg/animal	ip	biwk x 2
8	8	WWW0520/0523	959 µg/animal	ip	biwk x 2
9	8	WWW0548/0524	88 µg/animal	ip	biwk x 2
10	8	WWW0548/0524	368 µg/animal	ip	biwk x 2
11	8	WWW0548/0524	1,120 µg/animal	ip	biwk x 2
12	8	WWW0548/0556	113 µg/animal	ip	biwk x 2
13	8	WWW0548/0556	474 µg/animal	ip	biwk x 2

14	8	WWW0548/0556	1,442 µg/animal	ip	biwk x 2
15	8	WW0475	68 µg/animal	ip	biwk x 2
16	8	WW0475	283 µg/animal	ip	biwk x 2
17	8	WW0475	861 µg/animal	ip	biwk x 2
10	8	WW0619	17 µg/animal	ip	biwk x 2
11	8	WW0619	35 µg/animal	ip	biwk x 2
12	8	WW0619	70 µg/animal	ip	biwk x 2
13	8	WW0619	700 µg/animal	ip	biwk x 2
14	8	WW0621/0523	24 µg/animal	ip	biwk x 2
15	8	WW0621/0523	48 µg/animal	ip	biwk x 2
16	8	WW0621/0523	96 µg/animal	ip	biwk x 2
17	8	WW0621/0523	960 µg/animal	ip	biwk x 2

Procedures:

[360] Mice were anaesthetized with isoflurane for implant of cells to reduce the ulcerations. 308 CR female C57BL/6 mice were set up with $5x10^5$ MC38 tumor cells in 0% Matrigel sc in flank. Cell Injection Volume was 0.1 mL/mouse. Mouse age at start date was 8 to 12 weeks. Pair matches were performed when tumors reach an average size of 100 - 150 mm^3 and begin treatment. Body weights were taken at initiation and then biweekly to the end. Caliper measurements were taken biweekly to the end. Any adverse reactions were to be reported immediately. Any individual animal with a single observation of > than 30% body weight loss or three consecutive measurements of >25% body weight loss was euthanized. Any group with a mean body weight loss of >20 % or >10% mortality stopped dosing; the group was not euthanized, and recovery is allowed. Within a group with >20% weight loss, individuals hitting the individual body weight loss endpoint were euthanized. If the group treatment related body weight loss is recovered to within 10% of the original weights, dosing resumed at a lower dose or less frequent dosing schedule. Exceptions to non-treatment body weight % recovery were allowed on a case-by-case basis. Endpoint was tumor growth delay (TGD). Animals were monitored individually. The endpoint of the experiment was a tumor volume of 1500 mm^3 or 45 days, whichever comes first. Responders were followed longer. When the endpoint was reached, the animals are to be euthanized. Results are shown in FIGs. 4-6.

[361] Sample fusion protein constructs are detailed in Table 3. In table 3, "L" is an abbreviation of "linker", and "cleav. link." is an abbreviation of "cleavable linker". Other abbreviations "mIFNg" indicates mouse interferon gamma (IFNg); "hAlbumin" indicates human serum albumin (HSA); "mAlbumin" indicates mouse serum albumin.

Example 32. Human Interferon PBMC Assay

[362] Human PBMCs were isolated form blood obtained from healthy donors. After isolation, PBMCs were cryopreserved until the assay was performed. For the assay, PBMCs were thawed and plated in suspension at 100,000 cells/well in X-Vivo media supplemented with 1.5% of human serum albumin. 96 well round bottom plates were used for the assay. Cells were stimulated with a dilution series of recombinant human IFNα and activatable human IFNα for 48 hours at 37°C and 5% CO_2. Activity of uncleaved and cleaved activatable IFNα was tested. Cleaved inducible IFNα was generated by incubation with active recombinant protease. PBMC supernatants were collected and amounts of CXCL-10 (IP-10) produced were quantified using AlphaLISA as a measure of response. Results are shown in FIGs. 38A-38C.

Table 3: CONSTRUCT PERMUTATION TABLE ("6xHis" disclosed as SEQ ID NO: 354)

Construct Name	Construct Description
ACP01	(anti-HSA)-(cleav. link.)-mouse IFNg-(cleav. link.)-(anti-HSA)-6xHis
ACP02	(anti-HSA)-(cleav. link.)-mouse IFNg-(cleav. link.)-mouse IFNg-(cleav. link.)-(anti-HSA)-6xHis
ACP03	(anti-HSA)-(cleav. link.)-mouse IFNg-mouse IFNg-(cleav. link.)-(anti-HSA)-6xHis
ACP50	(anti-EpCAM)-(anti-HSA)-(cleav. link.)-mouse IFNg-mouse IFNg-(cleav. link.)-(anti-HSA)-6xHis
ACP51	(anti-EpCAM)-Linker-(anti-HSA)-(cleav. link.)-mIFNg-(cleav. link.)-(anti-HSA)-6xHis
ACP52	(anti-HSA)-(cleav. link.)-mIFNg-(cleav. link.)-(anti-HSA)-Linker-(anti-EpCAM)-6xHis
ACP53	mAlbumin-(cleav. link.)-mIFNg-(cleav. link.)-mAlbumin-6xHis
ACP54	mAlbumin-(cleav. link.)-mIFNg-Linker-mIFNg-(cleav. link.)-mAlbumin-6xHis
ACP30	(anti-HSA)-(cleav. link.)-mouse IFNg-(cleav. link.)-(anti-HSA)-(cleav. link.)-mouse IFNg-(cleav. link.)-(anti-HSA)-6xHis
ACP55	(anti-HSA)-(cleav. link.)-mouse IFNg-(cleav. link.)-(anti-HSA)-(cleav. link.)-mouse IFNg-(cleav. link.)-(anti-HSA)-6xHis-C-tag
ACP56	(anti-FOLR1)-Linker-(anti-HSA)-(cleav. link.)-mIFNg-(cleav. link.)-(anti-HSA)-6xHis
ACP57	(anti-HSA)-(cleav. link.)-mIFNg-(cleav. link.)-(anti-HSA)-Linker-(anti-FOLR1)-6xHis
ACP58	(anti-HSA)-(cleav. link.)-mIFNg-(cleav. link.)-mIFNg-(cleav. link.)-(anti-HSA)-Linker-(anti-EpCAM)-6xHis
ACP59	(anti-FOLR1)-Linker-(anti-HSA)-(cleav. link.)-mIFNg-(cleav. link.)-mIFNg-(cleav. link.)-(anti-HSA)-6xHis
ACP60	(anti-HSA)-(cleav. link.)-mIFNg-(cleav. link.)-mIFNg-(cleav. link.)-(anti-HSA)-Linker-(anti-FOLR1)-6xHis

ACP61	(anti-HSA)-(cleav. link.)-mIFNg-(cleav. link.)-mIFNg-(cleav. link.)-(anti-HSA)-Linker-FN(CGS-2)-6xHis
ACP63	anti-FN CGS-2 scFv (Vh/Vl)-6xHis
ACP69	(anti-HSA)-(cleav. link.)-mouse IFNg-(cleav. link.)-(anti-HSA)-(cleav. link.)-mouse IFNg
ACP70	mouse IFNg-(cleav. link.)-(anti-HSA)-(cleav. link.)-mouse IFNg-(cleav. link.)-(anti-HSA)
ACP71	mouse IFNg-(cleav. link.)-mAlbumin-(cleav. link.)-mouse IFNg-(cleav. link.)-mAlbumin
ACP72	mAlbumin-(cleav. link.)-mouse IFNg-(cleav. link.)-mAlbumin-(cleav. link.)-mouse IFNg
ACP73	mAlbumin-(cleav. link.)-mouse IFNg-(cleav. link.)-mAlbumin-(cleav. link.)-mouse IFNg-(cleav. link.)-mAlbumin
ACP74	mAlbumin-(cleav. link.)-mouse IFNg-(cleav. link.)-5mer linker-mAlbumin-5mer linker-(cleav. link.)-mouse IFNg-(cleav. link.)-mAlbumin
ACP75	mAlbumin-(cleav. link.)-mouse IFNg-(cleav. link.)-10mer linker-mAlbumin-10mer linker-(cleav. link.)-mouse IFNg-(cleav. link.)-mAlbumin
ACP78	(anti-HSA)-Linker-mouse_IFNg-Linker-(anti-HSA)-Linker-mouse_IFNg-Linker-(anti-HSA)_(non-cleavable_control)
ACP134	Anti-HSA-(cleav. link.)-mouse_IFNg-(cleav. link.)-anti-HSA-(cleav. link.)-mouse_IFNg-(cleav. link.)-anti-HSA-L-anti-FOLR1
ACP135	Anti-FOLR1-L-HSA-(cleav. link.)-mouse_IFNg-(cleav. link.)-HSA-(cleav. link.)-mouse_IFNg-(cleav. link.)-HSA
ACP04	human p40-murine p35-6xHis
ACP05	human p40-human p35-6xHis
ACP34	mouse p35-(cleav. link.)-mouse p40-6xHis
ACP35	mouse p35-GS-(cleav. link.)-GS-mouse p40-6xHis
ACP36	(anti-HSA)-(Cleav. Linker)-mouse p40-mouse p35-(Cleav. Linker)-(anti-HSA)-6xHis
ACP37	(anti-EpCAM)-(anti-HSA)-(Cleav. Linker)-mouse p40-mouse p35-(Cleav. Linker)-(anti-HSA)-6xHis
ACP79	(anti-EpCAM)-Linker-(anti-HSA)-(cleav. link.)-mIL12-(cleav. link.)-(Anti-HSA)-6xHis
ACP80	(anti-HSA)-(cleav. link.)-mIL12-(cleav. link.)-(anti-HSA)-Linker-(anti-EpCAM)-6xHis
ACP06	Blocker12-Linker-(cleav. link.)-human p40-Linker-mouse p35-(cleav. link.)-(anti-HSA)-6xHis
ACP07	Blocker12-Linker-(cleav. link.)-human p40-Linker-mouse p35-(cleav. link.)-(anti-HSA)-Linker-(anti-FOLR1)-6xHis
ACP08	(anti-FOLR1)-Linker-Blocker12-Linker-(cleav. link.)-human p40-Linker-mouse p35-(cleav. link.)-(anti-HSA)-6xHis
ACP09	(anti-HSA)-Linker-Blocker12-Linker-(cleav. link.)-human p40-Linker-mouse p35-6xHis
ACP10	(anti-HSA)-(cleav. link.)-human p40-L-mouse p35-(cleav. link.)-Linker-Blocker12-6xHis
ACP11	Human_p40-Linker-mouse_p35-(cleav. link.)-Linker-Blocker12-Linker-(anti-HSA)-6xHis

ACP91	human_p40-Linker-mouse_p35-Linker-Linker-Blocker-Linker-(anti-HSA)_(non-cleavable_control)
ACP136	human p40-L-mouse p35-(cleav. link.)-Blocker
ACP138	human_p40-L-mouse_p35-(cleav. link.)-Blocker-L-(anti-HSA)-L-FOLR1
ACP139	Anti-FOLR1-L-human_p40-L-mouse_p35-(cleav. link.)-Blocker12-L-(anti-HSA)
ACP140	Anti-FOLR1-(cleav. link.)-human_p40-L-mouse_p35-(cleav. link.)-Blocker12-L-(anti-HSA)
ACP12	(anti-EpCAM)-IL2-(cleav. link.)-(anti-HSA)-blocker2-6xHis
ACP13	(anti-EpCAM)-Blocker2-(anti-HSA)-(cleav. link.)-IL2-6xHis
ACP14 (WW0045)	Blocker2-Linker-(cleav. link.)-IL2- (cleav. link.)-(anti-HSA)-6xHis
ACP15 (WW0047)	Blocker2-Linker-(anti-HSA)-Linker-(cleav. link.)- IL2 -6xHis
ACP16 (WW0048)	IL2-(cleav. link.)-(anti-HSA)-Linker-(cleav. link.)-Blocker2-6xHis
ACP17	(anti-EpCAM)-Linker-IL2-(cleav. link.)-(anti-HSA)-Linker-(cleav. link.)-Blocker2-6xHis
ACP18	(anti-EpCAM)-Linker-IL2-(cleav. link.)-(anti-HSA)-Linker-vh(cleav. link.)vl-6xHis
ACP19	IL2-(cleav. link.)-Linker-Blocker2-Linker-(anti-HSA)-Linker-(anti-EpCAM) -6xHis
ACP20 (WW0056)	IL2-(cleav. link.)-Blocker2-6xHis
ACP21 (WW0057)	IL2-(cleav. link.)-Linker-Blocker2-6xHis
ACP22	IL2-(cleav. link.)-Linker-blocker-(cleav. link.)-(anti-HSA)-Linker-(anti-EpCAM)-6xHis
ACP23	(anti-FOLR1)-(cleav. link.)-Blocker2-Linker-(cleav. link.)-(anti-HSA)-(cleav. link.)- IL2-6xHis
ACP24 (WW0074)	(Blocker2)-(cleav. link.)-(IL2)-6xHis
ACP25 (WW0075)	Blocker2-Linker-(cleav. link.)-IL2-6xHis
ACP26	(anti-EpCAM)-Linker-IL2-(cleav. link.)-(anti-HSA)-Linker-blocker(NARA1 Vh/Vl)
ACP27	(anti-EpCAM)-Linker-IL2-(cleav. link.)-(anti-HSA)-Linker-blocker(NARA1 Vl/Vh)
ACP28	IL2-(cleav. link.)-Linker-Blocker2-(NARA1 Vh/Vl)-Linker-(anti-HSA)-Linker-(anti-EpCAM)
ACP29	IL2-(cleav. link.)-Linker-Blocker2-(NARA1 Vl/Vh)-Linker-(anti-HSA)-Linker-(anti-EpCAM)
ACP38	IL2-(cleav. link.)-blocker-(anti-HSA)-(anti-EpCAM)-6xHis
ACP39	(anti-EpCAM)-(cleav. link.)-(anti-HSA)-(cleav. link.)-Blocker2-(cleav. link.)-IL-2-6xHis
ACP40 (WW0076)	CD25ecd-Linker-(cleav. link.)-IL2-6xHis
ACP41 (WW0077)	IL2-(cleav. link.)-Linker-CD25ecd-6xHis
ACP42	(anti-HSA)-Linker-CD25ecd-Linker-(cleav. link.)-IL2-6xHis

(WW0078)	
ACP43 (WW0079)	IL2-(cleav. link.)-Linker-CD25ecd-Linker-(anti-HSA)-6xHis
ACP44 (WW0080)	IL2-(cleav. link.)-Linker-CD25ecd-(cleav. link.)-(anti-HSA)-6xHis
ACP45 (WW0046)	(anti-HSA)-(cleav. link.)-Blocker2-Linker-(cleav. link.)-IL2-6xHis
ACP46	IL2-(cleav. link.)-linkerL-vh(cleav. link.)vl-Linker-(anti-HSA)-L-(anti-EpCAM)-6xHis
ACP47	(anti-EpCAM)-Linker-IL2-(Cleavable Linker)-(anti-HSA)-Linker-Blocker2-6xHis
ACP48 (WW0054)	IL2-(cleav. link.)-Blocker2-Linker-(anti-HSA)-6xHis
ACP49 (WW0055)	IL2-(cleav. link.)-Linker-Blocker2-Linker-(anti-HSA)-6xHis
ACP92	(anti-HSA)-(16mer Cleav. Link.)-IL2-(16mer Cleav. Link.)-(anti-HSA)-6XHis
ACP93	(anti-EpCAM)-(anti-HSA)-(anti-EpCAM)-Blocker2-(cleav. link.)-IL2-6xHis
ACP94	(anti-EpCAM)-(anti-HSA)-Blocker2-(cleav. link.)-IL2-6xHis
ACP95	(anti-EpCAM)-(anti-HSA)-(cleav. link.)-IL2-6xHis
ACP96	(anti-EpCAM)-(16mer cleav. link.)-IL2-(16mer cleav. link.)-(anti-HSA)
ACP97	(anti-EpCAM)-(anti-HSA)-(cleav. link.)-IL2-(cleav. link.)-(anti-HSA)-6xHis
ACP99	(anti-EpCAM)-Linker-IL2-(cleav. link.)-(anti-HSA)-6xHis
ACP100	(anti-EpCAM)-Linker-IL2-6xHis
ACP101 (WW0061)	IL2-(cleav. link.)-(anti-HSA)-6xHis
ACP102	(anti-EpCAM)-(cleav. link.)-IL2-(cleav. link.)-(anti-HSA)-Linker-blocker-6xHis
ACP103	IL2-(cleav. link.)-Linker-Blocker2-Linker-(anti-HSA)-Linker-(antiI-FOLR1)-6xHis
ACP104	(anti-FOLR1)-IL2-(cleav. link.)-(anti-HSA)-Linker-Blocker2-6xHis
ACP105	Blocker2-Linker-(cleav. link.)-IL2-(cleav. link.)-(anti-HSA)-Linker-(anti-FOLR1)-6xHis
ACP106	(anti-FOLR1)-Linker-(anti-HSA)-(cleav. link.)-blocker-Linker-(cleav. link.)-IL2 -6xHis
ACP107	Blocker2-Linker-(anti-HSA)-(cleav. link.)-IL2-Linker-(anti-FOLR1)-6xHis
ACP108	(anti-EpCAM)-IL2-(Dually cleav. link.)-(anti-HSA)-Linker-blocker-6xHis
ACP117	anti-FN CGS-2 scFv (Vh/Vl)-6xHis
ACP118	NARA1 Vh/Vl non-cleavable
ACP119	NARA1 Vh/Vl cleavable
ACP120	NARA1 Vl/Vh non-cleavable
ACP121	NARA1 Vl/Vh cleavable
ACP124 (WW0159)	IL2-Linker-(anti-HSA)-Linker-Linker-blocker_(non-cleavable_control)
ACP132	IL2-L-HSA

(WW0177)	
ACP141 (WW0178)	IL2-L-human_Albumin
ACP142 (WW0179)	IL2-(cleav. link.)-human_Albumin
ACP144	IL2-(cleav. link.)-HSA-(cleav.-link.)blocker-L-(anti-FOLR1)
ACP145	Anti-FOLR1-L-IL2-(cleav. link.)-HSA-Linker-(cleav. link.)-blocker2
ACP146	Anti-FOLR1-(cleav. link)-IL2-(cleav. link.)-HSA-Linker-(cleav. link.)-blocker2
ACP133 (WW0196)	IL2-6x His
ACP147	IL2-(cleav. Linker)-(anti-HSA)-Linker-(cleav. link.)-blocker2-L-(anti-EpCAM)
ACP148	(anti-EpCAM)-L-IL2-(cleav. link.)-(anti-HSA)-L-(cleav. Linker)-blocker2
ACP149	(anti-EpCAM)-(cleav. link.)-IL2-(cleav. Linker)-(anti-HSA)-L-(cleav. Linker)-blocker2
ACP31	(anti-HSA)-(cleav. link.)-mIFNa1-(cleav. link.)-(anti-HSA)
ACP32	(anti-HSA)-(cleav. link.)-mIFNa1(N+C trunc)-(cleav. link.)-(anti-HSA)
ACP33	(anti-HSA)-(cleav. link.)-mIFNa1(C trunc)-(cleav. link.)-(anti-HSA)
ACP131	mIFNa1
ACP125	Anti-HSA-(cleav. link.)-mIFNa1
ACP126	mIFNa1-(cleav. link.)-(anti-HSA)
ACP127	Mouse_Albumin-(cleav. Link.)-mIFNa1-(cleav link)-mouse_Albumin
ACP128	Mouse_Albumin-(cleav. link.)-mIFNa1
ACP129	mIFNa1-(cleav. link.)-mAlb
ACP150	(Anti-FOLR1)-L-(anti-HSA)-(cleav. Link.)-mIFNa1-(cleav. Link.)-(anti-HSA)
ACP151	Anti-FOLR1-L-(anti-HSA)-(cleav. Link.)-mIFNa1-(cleav. Link.)-(anti-HSA)-L-(anti-FOLR1)
ACP152	(anti-HSA)-L-mIFNa1-L-(anti-HSA)_(non-cleavable_control)
ACP153 (WW0201)	IL2-(cleav. link.)-(anti-HSA)-linker(cleav. link.)-blocker2
ACP154 (WW0202)	IL2-(cleav. link.)-(anti-HSA)-linker(cleav. link.)-blocker2
ACP155 (WW0203)	IL2-(cleav. link.)-(anti-HSA)-linker(cleav. link.)-blocker2
ACP156 (WW0204)	IL2-X-anti-HSA-LX-blocker_(X=Linker4_Blocker=Vh-Vl)
ACP157 (WW0205)	IL2-X-anti-HSA-LX-blocker_(X=Linker5_Blocker=Vh-Vl)
ACP200	mAlb(D3)-X-mouse-IFNa-X-mAlb(D3)_(X=Linker 1)
ACP201	mAlb(D1-L-D3)-X-mouse-IFNa-X-mAlb(D1-L-D3)_(X=Linker 1)
ACP202	HSA-X-mIFNa1-X-HSA_(X=Linker 1+17aa)

ACP203	HSA-X-mIFNa1-X-HSA _(X= Linker 2)
ACP204	HSA-X-mIFNa1-X-HSA _(X=Linker 3)
ACP205	HSA-X-mIFNa1-X-HSA _(X=Linker 4)
ACP206	HSA-X-Human_IFNA2b-X-HSA _(X= Linker 2)
ACP207	HSA-X-Human_IFNA2b-X-HSA _(X=Linker 3)
ACP208	HSA-X-Human_IFNA2b-X-HSA _(X=Linker 4)
ACP211	HSA-X-mouse-IFNg-X-IFNa-X-mouse-IFNg-X-HSA_(X=Linker 1)
ACP213	mAlb(D3)-X-mouse-IFNg-X-mAlb(D3)-X-mouse-IFNg-X-mAlb(D3)_(X=Linker 1)
ACP214	mAlb(D1-L-D3)-X-mouse-IFNg-X-mAlb(D1-L-D3)-X-mouse-IFNg-X-mAlb(D1-L-D3)_(X=Linker 1)
ACP215	HSA-X-mouse-IFNg-X-HSA-X-mouse-IFNg-X-HSA_(X=Linker 1+17aa)
ACP240	HSA-L-human_p40-L-mouse_p35-LL-Blocker_(non-cleavable;Blocker=Vl/Vh)
ACP241	mAlb-X-human_p40-L-mouse_p35-XL-Blocker_(X=Linker 1;Blocker=Vl/Vh)
ACP242	human_p40-L-mouse_p35-XL-Blocker-X-mAlb_(X=Linker 1;Blocker=Vl/Vh)
ACP243	mIgG1_Fc-X-human_p40-L-mouse_p35-XL-Blocker_(X=Linker 1;Blocker= Vl/Vh)
ACP244	human_p40-L-mouse_p35-XL-Blocker-X-mIgG1_Fc_(X=Linker 1;Blocker= Vl/Vh)
ACP245	HSA-X-human_p40-L-mouse_p35-XL-Blocker(cleavable)_(X=Linker 1;Blocker= Vl-X-Vh)
ACP247	HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=3CYT5;X=Linker 1)
ACP284	HSA-X-mouse_p35-XL-Blocker_(Blocker=Vl/Vh;X=Linker 1)
ACP285	HSA-X-human_p40_C199S-L-mouse_p35_C92S-XL-Blocker_(Blocker= _Vl/Vh;X=Linker 1)
ACP286	HSA-X-human p40-L(4xG4S (SEQ ID NO: 453))-mouse p35-XL-Blocker_(Blocker= Vl/Vh;X=Linker 1)
ACP287	HSA-X-human_p40_mouse_p35-XL-Blocker_(Blocker=Vl/Vh_VH44-VL100_disulfide;X=Linker 1)
ACP288	HSA-X-human_p40_mouse_p35-XL-Blocker_(Blocker=Vl/Vh_VH105-VL43_disulfide;X=Linker 1)
ACP289 (WW0233)	Geneart_WW0048_IL2-X-HSA-LX-blocker_Fusion_protein-6xHis
ACP290 (WW0234)	IL2-X-HSA-LX-blocker_(X=Linker 1;Blocker=3TOW69)
ACP291 (WW0235)	IL2-X-HSA-LX-blocker_(X=Linker 1;Blocker=3TOW85)
ACP292 (WW0236)	IL2-X-HSA-LX-blocker_(X=Linker 1;Blocker=2TOW91)
ACP296 (WW0250)	IL2-X-HSA-LX-blocker(cleavable)_(X=Linker 1;Blocker=Vh-X-Vl)
ACP297 (WW0251)	IL2-X-HSA-LX-blocker(A46L)_(X=Linker 1;Blocker=Vh/Vl)
ACP298 (WW0252)	IL2-X-HSA-LX-blocker(A46G)_(X=Linker 1;Blocker= Vh/Vl)
ACP299	IL2(Cys145Ser)-X-HSA-LX-blocker_(X=Linker 1;Blocker=Vh/Vl)

(WW0253)	
ACP300 (WW0255)	IL2-X-hAlb-LX-blocker_(X=Linker 1;Blocker= Vh/Vl)
ACP302 (WW0296)	IL2-X-mAlb-LX-blocker_(X=Linker 1;Blocker=Vh/Vl)
ACP303	mAlb-X-IL2(Nterm-41)-X-mALB_(X=Linker 1)
ACP304 (WW0302)	IL2-X-HSA-LX-blocker-XL-CD25ecd_(X=Linker 1;Blocker= Vh/Vl)
ACP305 (WW0303)	CD25ecd-LX-IL2-X-HSA-LX-blocker_(X=Linker 1;Blocker= Vh/Vl)
ACP306 (WW0304)	IL2-XL-CD25ecd-X-HSA-LX-blocker_(X=Linker 1;Blocker= Vh/Vl)
ACP309 (WW0307)	IL2-X-HSA-LX-blocker(A46S)_(X=Linker 1;Blocker= Vh/Vl)
ACP310 (WW0308)	IL2-X-HSA-LX-blocker(QAPRL_FR2)_(X=Linker 1;Blocker=Vh/Vl)
ACP311 (WW0316)	IL2-X-IgG4_Fc(S228P)-LX-Blocker_(X=Linker 1;Blocker= Vh/Vl)
ACP312 (WW0317)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(X=Linker 1;Blocker= Vh/Vl)
ACP313 (WW0318)	IL2-XL-Blocker-X-IgG4_Fc(S228P)_(X=Linker 1;Blocker= Vh/Vl)
ACP314 (WW0354)	mIgG1_Fc-X-IL2-LX-Blocker_(X=Linker 1;Blocker=Vh/Vl)
ACP336 (WW0414)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh-X-Vl_A46S;X= Linker 2)
ACP337 (WW0415)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S;X= Linker 2)
ACP338 (WW0416)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh-X-Vl;X= Linker 2)
ACP339 (WW0417)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl;X= Linker 2)
ACP340 (WW0418)	IL2-X-anti-HSA-LX-blocker_(Blocker=Hu2TOW91_B;X= Linker 2)
ACP341 (WW0419)	IL2-X-anti-HSA-LX-blocker_(Blocker=Hu3TOW85_A;X= Linker 2)
ACP342 (WW0420)	CD25ecd_C213S-LX-IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh-X-Vl_A46S;X= Linker 2)

ACP343 (WW0421)	CD25ecd_C213S-LX-IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S;X= Linker 2)
ACP344 (WW0422)	CD25ecd_C213S-LX-IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh-X-Vl;X= Linker 2)
ACP345 (WW0423)	CD25ecd_C213S-LX-IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl;X= Linker 2)
ACP346 (WW0424)	CD25ecd_C213S-LX-IL2-X-anti-HSA-LX-blocker_(Blocker=Hu2TOW91_B;X= Linker 2)
ACP347 (WW0425)	CD25ecd_C213S-LX-IL2-X-anti-HSA-LX-blocker_(Blocker=Hu3TOW85_A;X= Linker 2)
ACP348 (WW0426)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.A02_Vh-X-Vl_A46S;X= Linker 2)
ACP349 (WW0427)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.A02_Vh\Vl_A46S;X= Linker 2)
ACP350 (WW0428)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.F03_Vh-X-Vl;X= Linker 2)
ACP351 (WW0429)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.F03_Vh\Vl;X= Linker 2)
ACP352 (WW0430)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(Blocker=Hu2TOW91_B;X= Linker 2)
ACP353 (WW0431)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(Blocker=Hu3TOW85_A;X= Linker 2)
ACP354 (WW0432)	IgG4_Fc(S228P)-X-CD25ecd_C213S-LX-IL2-LX-Blocker_(Blocker=VHVL.F2.high.A02_Vh-X-Vl_A46S;X= Linker 2)
ACP355 (WW0433)	IgG4_Fc(S228P)-X-CD25ecd_C213S-LX-IL2-LX-Blocker_(Blocker=VHVL.F2.high.A02_Vh\Vl_A46S;X= Linker 2)
ACP356 (WW0434)	IgG4_Fc(S228P)-X-CD25ecd_C213S-LX-IL2-LX-Blocker_(Blocker=VHVL.F2.high.F03_Vh-X-Vl;X= Linker 2)
ACP357 (WW0435)	IgG4_Fc(S228P)-X-CD25ecd_C213S-LX-IL2-LX-Blocker_(Blocker=VHVL.F2.high.F03_Vh\Vl;X= Linker 2)
ACP358 (WW0436)	IgG4_Fc(S228P)-X-CD25ecd_C213S-LX-IL2-LX-Blocker_(Blocker=Hu2TOW91_B;X= Linker 2)
ACP359 (WW0437)	IgG4_Fc(S228P)-X-CD25ecd_C213S-LX-IL2-LX-Blocker_(Blocker=Hu3TOW85_A;X= Linker 2)
ACP371 (WW0513)	IL2-X-anti-HSA-LX-blocker_(Blocker= Vh/Vl_VH44-VL100_disulfide;X= Linker 2)
ACP372 (WW0514)	IL2-X-anti-HSA-LX-blocker_(Blocker= Vh/Vl_VH105-VL43_disulfide;X=Linker 2)

ACP373 (WW0515)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH44-VL100_disulfide;X= Linker 2)
ACP374 (WW0516)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH105-VL43_disulfide;X= Linker 2)
ACP375 (WW0517)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH44-VL100_disulfide;X= Linker 2)
ACP376 (WW0521)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH105-VL43_disulfideX= Linker 2)
ACP377 (WW0519)	IL2-X-anti-HSA-LX-blocker_(Blocker=Hu2TOW91_A;X= Linker 2)
ACP378 (WW0520)	IL2-X-anti-HSA-LX-Heavy_blocker_Fab_(Blocker=VH-CH1;X=Linker 2)
ACP379 (WW0521)	IgG4_Fc(S228P)-X-IL2-LX-Heavy_blocker_Fab_(Blocker=VH-CH1;X= Linker 2)
ACP383 (WW0525)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=Vh/Vl_VH44-VL100_disulfide;X=LINKER 2)
ACP38 (WW05264)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=Vh/Vl_VH105-VL43_disulfide;X=MMP14-1)
ACP385 (WW0527)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH44-VL100_disulfide;X=LINKER 2)
ACP386 (WW0528)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH105-VL43_disulfide;X=Linker 2)
ACP387 (WW0529)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH44-VL100_disulfide;X=Linker 2)
ACP388 (WW0530)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH105-VL43_disulfide;X=Linker 2)
ACP389 (WW0531)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=Hu2TOW91_A;X=Linker 2)
ACP390 (WW0532)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S_VH44-VL100_disulfide;X=Linker 2)
ACP391 (WW0533)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S_VH44-VL100_disulfide;X=Linker 2)
ACP392 (WW0534)	IL2-XL-CD25ecd_C213S-X-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh_G44C_Vl_A46S_G100C;X=Linker 2)
ACP393 (WW0535)	IL2-XL-CD25ecd_C213S-X-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh_Q105C_Vl_A43C;X=Linker 2)
ACP394 (WW0536)	IL2-XL-CD25ecd_C213S-X-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh_G44C_Vl_G100C;X=Linker 2)

ACP395 (WW0537)	IL2-XL-CD25ecd_C213S-X-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh_Q105C_Vl_A43C;X=Linker 2)
ACP396 (WW0538)	IL2-XL-CD25ecd_C213S-X-HSA-LX-blocker_(Blocker=Hu2TOW91_A;X=Linker 2)
ACP397 (WW0539)	IL2-XL-CD25ecd_C213S-X-HSA-LX-blocker_(Blocker=Hu2TOW91_B;X=Linker 2)
ACP398 (WW0540)	IL2-XL-CD25ecd_C213S-X-HSA-LX-Heavy_blocker_Fab_(Blocker=VH-CH1;X=Linker 2)
ACP399	Blocker-XL-HSA-X-IL2(Nterm-41)-X-HSA_(Blocker=VHVL.F2.high.A02_Vh_G44C_Vl_A46S_G100C;X=Linker 2)
ACP400	Blocker-XL-HSA-X-IL2(Nterm-41)-X-HSA_(Blocker=VHVL.F2.high.A02_Vh_Q105C_Vl_A43C;X=Linker 2)
ACP401	Blocker-XL-HSA-X-IL2(Nterm-41)-X-HSA_(Blocker=VHVL.F2.high.F03_Vh_G44C_Vl_G100C;X=Linker 2)
ACP402	Blocker-XL-HSA-X-IL2(Nterm-41)-X-HSA_(Blocker=VHVL.F2.high.F03_Vh_Q105C_Vl_A43C;X=Linker 2)
ACP403	Blocker-XL-HSA-X-IL2(Nterm-41)-X-HSA_(Blocker=Hu2TOW91_A;X=Linker 2)
ACP404	Blocker-XL-HSA-X-IL2(Nterm-41)-X-HSA_(Blocker=Hu2TOW91_B;X=Linker 2)
ACP405	Heavy_Blocker_Fab-XL-HSA-X-IL2(Nterm-41)-X-HSA_(Blocker=VH-CH1;X=Linker 2)
ACP406 (WW0548)	mIgG1_Fc(S228P)-X-IL2-LX-Heavy_blocker_Fab_(Blocker=VH-CH1;X=Linker 2)
ACP407 (WW0549)	mIgG1_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH44-VL100_disulfide;X=Linker 2)
ACP408 (WW0550)	mIgG1_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S_VH44-VL100_disulfide;X=Linker 2)
ACP409 (WW0551)	mIgG1_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH105-VL43_disulfidel;X=Linker 2)
ACP410 (WW0552)	mIgG1_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH44-VL100_disulfidel;X=Linker 2)
ACP411 (WW0553)	mIgG1_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH105-VL43_disulfidel;X=Linker 2)
ACP412 (WW0554)	mIgG1_Fc(S228P)-X-IL2-LX-blocker_(Blocker=Hu2TOW91_A;X=Linker 2)
ACP413 (WW0555)	CD25_213S-L-Kappa_blocker_Fab_(Blocker=VHVL.F2.high.A02_A46S_Kappa)
ACP414 (WW0556)	CD25_213S-L-Kappa_blocker_Fab_(Blocker=VHVL.F2.high.F03_Kappa)
ACP415 (WW0557)	IL2-XL-blocker-L-CD25_213S-X-HSA_Blocker=VHVL.F2.high.A02_Vh_G44C_Vl_A46S_G100C;X=Linker 2)
ACP416 (WW0558)	IL2-XL-blocker-L-CD25_213S-X-HSA_(Blocker=VHVL.F2.high.A02_Vh_Q105C_Vl_A43C;X=Linker 2)

ACP417 (WW0559)	IL2-XL-blocker-L-CD25_213S-X-HSA_(Blocker=VHVL.F2.high.F03_Vh_G44C_Vl_G100C;X=Linker 2)
ACP418 (WW0560)	IL2-XL-blocker-L-CD25_213S-X-HSA_(Blocker=VHVL.F2.high.F03_Vh_Q105C_Vl_A43C;X=Linker 2)
ACP419 (WW0561)	IL2-XL-blocker-L-CD25_213S-X-HSA_(Blocker=Hu2TOW91_A;X=Linker 2)
ACP420 (WW0562)	IL2-XL-blocker-L-CD25_213S-X-HSA_(Blocker=Hu2TOW91_B;X=Linker 2)
ACP421 (WW0563)	HSA-X-blocker-L-CD25_213S-LX-IL2_(Blocker=VHVL.F2.high.A02_Vh_G44C_Vl_A46S_G100C;X=Linker 2)
ACP422 (WW0564)	HSA-X-blocker-L-CD25_213S-LX-IL2_(Blocker=VHVL.F2.high.A02_Vh_Q105C_Vl_A43C;X=Linker 2)
ACP423 (WW0565)	HSA-X-blocker-L-CD25_213S-LX-IL2_(Blocker=VHVL.F2.high.F03_Vh_G44C_Vl_G100C;X=Linker 2)
ACP424 (WW0566)	HSA-X-blocker-L-CD25_213S-LX-IL2_(Blocker=VHVL.F2.high.F03_Vh_Q105C_Vl_A43C;X=Linker 2)
ACP425 (WW0567)	HSA-X-blocker-L-CD25_213S-LX-IL2_(Blocker=Hu2TOW91_A;X=Linker 2)
ACP426 (WW0568)	HSA-X-blocker-L-CD25_213S-LX-IL2_(Blocker=Hu2TOW91_B;X=Linker 2)
ACP427 (WW0569)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.A02_Vh_G44C_Vl_A46S_G100C, Blocker2=Hu2TOW91_A;X=Linker 2)
ACP428 (WW0570)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.A02_Vh_Q105C_Vl_A43C, Blocker2=Hu2TOW91_A;X=Linker 2)
ACP429 (WW0571)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.F03_Vh_G44C_Vl_G100C, Blocker2=Hu2TOW91_A;X=Linker 2)
ACP430 (WW0572)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.F03_Vh_Q105C_Vl_A43C, Blocker2=Hu2TOW91_A;X=Linker 2)
ACP431 (WW0573)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.A02_Vh_G44C_Vl_A46S_G100C, Blocker2=Hu2TOW91_B;X=Linker 2)
ACP432 (WW0574)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.A02_Vh_Q105C_Vl_A43C, Blocker2=Hu2TOW91_B;X=Linker 2)
ACP433 (WW0575)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.F03_Vh_G44C_Vl_G100C, Blocker2=Hu2TOW91_B;X=Linker 2)
ACP434 (WW0576)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.F03_Vh_Q105C_Vl_A43C, Blocker2=Hu2TOW91_B;X=Linker 2)
ACP439 (WW0581)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.C07_Vh/Vl;X=Linker 2)

ACP440 (WW0582)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.C07_Vh/Vl_A46S;X=Linker 2)
ACP441 (WW0583)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.C07_Vh/Vl_A46L;X=Linker 2)
ACP442 (WW0584)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.C07_Vh/Vl_A46S_VH44-VL100_disulfide;X=Linker 2)
ACP443 (WW0585)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.C07_Vh/Vl_A46L_VH44-VL100_disulfide;X=Linker 2)
ACP444 (WW0586)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.C07_Vh/Vl_VH105-VL43_disulfide;X=Linker 2)
ACP445 (WW0587)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh-X-Vl_A46L;X=Linker 2)
ACP446 (WW0588)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46L;X=Linker 2)
ACP447 (WW0589)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46L_VH44-VL100_disulfide;X=Linker 2)
ACP451 (WW0615)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S;X=Linker 3)
ACP452 (WW0616)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl;X=Linker 3)
ACP453 (WW0617)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S_VH44-VL100_disulfide;X=Linker 3)
ACP454 (WW0618)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH105-VL43_disulfidel;X=Linker 3)
ACP455 (WW0619)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH44-VL100_disulfide;X=Linker 3)
ACP456 (WW0620)	IL2-X-anti-HSA-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH105-VL43_disulfideX=Linker 3)
ACP457 (WW0621)	IL2-X-anti-HSA-LX-Heavy_blocker_Fab_(Blocker= VH-CH1;X=Linker 3)
ACP458 (WW0622)	IgG4_Fc(S228P)-X-IL2-LX-Heavy_blocker_Fab_(Blocker= VH-CH1;X=Linker 3)
ACP459 (WW0623)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.A02_Vh\Vl_A46S;X=Linker 3)
ACP460 (WW0624)	IgG4_Fc(S228P)-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.F03_Vh\Vl;X=Linker 3)
ACP461 (WW0625)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S_VH44-VL100_disulfide;X=Linker 3)

ACP462 (WW0626)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH105-VL43_disulfidel;X=Linker 3)
ACP463 (WW0627)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH44-VL100_disulfidel;X=Linker 3)
ACP464 (WW0628)	IgG4_Fc(S228P)-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH105-VL43_disulfidel;X=Linker 3)
ACP465 (WW0629)	mIgG1_Fc-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.A02_Vh\Vl_A46S;X=Linker 3)
ACP466 (WW0630)	mIgG1_Fc-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.F03_Vh\Vl;X=Linker 3)
ACP467 (WW0631)	mIgG1_Fc-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_A46S_VH44-VL100_disulfide;X=Linker 3)
ACP468 (WW0632)	mIgG1_Fc-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.A02_Vh/Vl_VH105-VL43_disulfidel;X=Linker 3)
ACP469 (WW0633)	mIgG1_Fc-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH44-VL100_disulfidel;X=Linker 3)
ACP470 (WW0634)	mIgG1_Fc-X-IL2-LX-blocker_(Blocker=VHVL.F2.high.F03_Vh/Vl_VH105-VL43_disulfidel;X=Linker 3)
ACP471 (WW0642)	mIgG1_Fc-X-IL2-LX-Heavy_blocker_Fab_(Blocker=VH-CH1;X=Linker 3)
WW0301	IL2-X-anti-HSA-LL-blocker_(X=Linker1_Blocker=Vh-Vl)
WW0353	IL2-X-mIgG1_Fc-LX-Blocker_(X=Linker1_Blocker=Vh-Vl)
WW0355	IL2-XL-Blocker-X-mIgG1_Fc_(X=Linker1_Blocker=Vh-Vl)
WW0365	IL-2-L-anti-HSA-LX-Blocker_(instead_of_WW0048_IL2-X-anti-HSA-LX-blocker)_(X=Linker1)
WW0366	IL-2-X-anti-HSA_(GeneArt_version_of_WW0061)_(X=Linker1)
WW0472	mIgG1_Fc-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.A02_Vh-X-Vl_A46S_X=Linker2)
WW0473	mIgG1_Fc-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.A02_Vh-Vl_A46S_X=Linker2)
WW0474	mIgG1_Fc-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.F03_Vh-X-Vl_X=Linker2)
WW0475	mIgG1_Fc-X-IL2-LX-Blocker_(Blocker=VHVL.F2.high.F03_Vh-Vl_X=Linker2)
WW0476	mIgG1_Fc-X-IL2-LX-Blocker_(Blocker=Hu2TOW91_B_X=Linker2)
WW0477	mIgG1_Fc-X-IL2-LX-Blocker_(Blocker=Hu3TOW85_A_X=Linker2)
WW0641	anti-HSA-X-human_p40_mouse_p35-XL-Blocker_(Blocker=Vl/Vh_VH105-VL43_disulfide;X=Linker1)
WW0649	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Vl/Vh_X=Linker2)
WW0650	anti-HSA-X-human_p40-L-Human_p35-XL-Blocker_(Blocker=Vl/Vh_X=Linker2)
WW0651	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Vl/Vh_X=Linker3)
WW0652	anti-HSA-X-human_p40-L-Human_p35-XL-Blocker_(Blocker=Vl/Vh_X=Linker3)
WW0662	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt1_Hv_D53E_D61E_Vl/Vh_X=Linker2)

WW0663	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt1_Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0664	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt2_Lv_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0665	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt2_Lv_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0666	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt3_LV_S30D-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0667	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt3_LV_S30D-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0668	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt4_LV_S30D_N31E_Vl/Vh_X=Linker2)
WW0669	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt4_LV_S30D_N31E_Vl/Vh_X=Linker2)
WW0670	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt5_Lv_S30D_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0672	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt6_Lv_R27E_T32D(LCharge_16(combo2))_Vl/Vh_X=Linker2)
WW0673	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt6_Lv_R27E_T32D(LCharge_16(combo2))_Vl/Vh_X=Linker2)
WW0674	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt7_Lv_S30E-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0675	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt7_Lv_S30E-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0676	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt8_Lv_S30E N31E_Vl/Vh_X=Linker2)
WW0677	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt8_Lv_S30E N31E_Vl/Vh_X=Linker2)
WW0678	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt9_Lv_N31E-Hv_D53E_Vl/Vh_X=Linker2)
WW0679	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt9_Lv_N31E-Hv_D53E_Vl/Vh_X=Linker2)
WW0680	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt1_Hv_D53E_D61E_Vl/Vh_X=Linker3
WW0681	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt1_Hv_D53E_D61E_Vl/Vh_X=Linker3)
WW0682	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt2_Lv_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker3
WW0683	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt2_Lv_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker3)
WW0684	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt3_LV_S30D-Hv_D53E_D61E_Vl/Vh_X=Linker3
WW0685	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt3_LV_S30D-Hv_D53E_D61E_Vl/Vh_X=Linker3)
WW0686	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt4_LV_S30D_N31E_Vl/Vh_X=Linker3
WW0687	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt4_LV_S30D_N31E_Vl/Vh_X=Linker3)
WW0688	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt5_Lv_S30D_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker3
WW0689	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt5_Lv_S30D_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker3)
WW0690	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt6_Lv_R27E_T32D(LCharge_16(combo2))_Vl/Vh_X=Linker3
WW0691	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt6_Lv_R27E_T32D(LCharge_16(combo2))_Vl/Vh_X=Linker3)

WW0692	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt7_Lv_S30E-Hv_D53E_D61E_Vl/Vh_X=Linker3
WW0693	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt7_Lv_S30E-Hv_D53E_D61E_Vl/Vh_X=Linker3)
WW0694	anti-HSA-X-human_p40-L-mouse_p35-XL-Blocker_(Blocker=Opt8_Lv_S30E_N31E_Vl/Vh_X=Linker3
WW0695	anti-HSA-X-human_p40-L-human_p35-XL-Blocker_(Blocker=Opt8_Lv_S30E_N31E_Vl/Vh_X=Linker3)
WW0698	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_IGLC2-01_X=Linker2)
WW0699	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_IGLC2-01_X=Linker2)
WW0700	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_N31E_IGLC2-01_X=Linker2)
WW0701	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_N31E_IGLC2-01_X=Linker2)
WW0702	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_IGLC2-01_X=Linker2)
WW0703	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_IGLC2-01_X=Linker2)
WW0704	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_N31E_IGLC2-01_X=Linker2)
WW0705	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_N31E_IGLC2-01_X=Linker2)
WW0706	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_R27E_T32D_IGLC2-01_X=Linker2)
WW0707	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_R27E_T32D_IGLC2-01_X=Linker2)
WW0708	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30E_IGLC2-01_X=Linker2)
WW0709	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30E_IGLC2-01_X=Linker2)
WW0710	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30E_N31E_IGLC2-01_X=Linker2)
WW0711	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30E_N31E_IGLC2-01_X=Linker2)
WW0712	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_IGLC2-01_X=Linker3)
WW0713	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_IGLC2-01_X=Linker3)
WW0714	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_N31E_IGLC2-01_X=Linker3)
WW0715	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_N31E_IGLC2-01_X=Linker3)
WW0716	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_IGLC2-01_X=Linker3)
WW0717	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_IGLC2-01_X=Linker3)
WW0718	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_N31E_IGLC2-01_X=Linker3)
WW0719	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_N31E_IGLC2-01_X=Linker3)
WW0720	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_R27E_T32D_IGLC2-01_X=Linker3)
WW0721	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_R27E_T32D_IGLC2-01_X=Linker3)

WW0722	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30E_IGLC2-01_X=Linker3)
WW0723	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30E_IGLC2-01_X=Linker3)
WW0724	anti-HSA-X-human_p40-L-mouse_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30E_N31E_IGLC2-01_X=Linker3)
WW0725	anti-HSA-X-human_p40-L-human_p35-XL-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30E_N31E_IGLC2-01_X=Linker3)
WW0726	Fab_Heavy_Blocker_(Blocker=IL-12_Heavy_Fab_IgG1_Fab)
WW0727	Fab_Heavy_Blocker_(Blocker=IL-12_Heavy_Fab_D53E_D61E_IgG1_Fab)
WW0728	Fab_Heavy_Blocker_(Blocker=IL-12_Heavy_Fab_D53E_IgG1_Fab)
WW0765	human_p40-L-mouse_p35-X-anti-HSA-L-Blocker_(Blocker=Opt1_Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0766	human_p40-L-human_p35-X-anti-HSA-L-Blocker_(Blocker=Opt1_Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0767	human_p40-L-mouse_p35-X-anti-HSA-L-Blocker_(Blocker=Opt5_Lv_S30D_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0768	human_p40-L-human_p35-X-anti-HSA-L-Blocker_(Blocker=Opt5_Lv_S30D_N31E-Hv_D53E_D61E_Vl/Vh_X=Linker2)
WW0769	human_p40-L-mouse_p35-X-anti-HSA-L-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_IGLC2-01_X=Linker2)
WW0770	human_p40-L-human_p35-X-anti-HSA-L-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_IGLC2-01_X=Linker2)
WW0771	human_p40-L-mouse_p35-X-anti-HSA-L-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_N31E_IGLC2-01_X=Linker2)
WW0772	human_p40-L-human_p35-X-anti-HSA-L-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_N31E_IGLC2-01_X=Linker2)
WW0796	human_p40-L-mouse_p35-X-anti-HSA-L-Blocker_(Blocker=Opt1_Hv_D53E_D61E_Vl-Vh_X=Linker3)
WW0797	human_p40-L-human_p35-X-anti-HSA-L-Blocker_(Blocker=Opt1_Hv_D53E_D61E_Vl-Vh_X=Linker3)
WW0798	human_p40-L-mouse_p35-X-anti-HSA-L-Blocker_(Blocker=Opt5_Lv_S30D_N31E-Hv_D53E_D61E_Vl-Vh_X=Linker3)
WW0799	human_p40-L-human_p35-X-anti-HSA-L-Blocker_(Blocker=Opt5_Lv_S30D_N31E-Hv_D53E_D61E_Vl-Vh_X=Linker3)
WW0800	human_p40-L-mouse_p35-X-anti-HSA-L-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_IGLC2-01_X=Linker3)
WW0801	human_p40-L-human_p35-X-anti-HSA-L-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_IGLC2-01_X=Linker3)
WW0802	human_p40-L-mouse_p35-X-anti-HSA-L-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_N31E_IGLC2-01_X=Linker3)
WW0803	human_p40-L-human_p35-X-anti-HSA-L-Fab_Lambda_Blocker_(Blocker=Lambda_Fab_S30D_N31E_IGLC2-01_X=Linker3)
WW0643	HSA-X-mIFNa11-X-HSA_(X=Linker2)
WW0644	HSA-X-mIFNa11-X-HSA_(X=Linker3)
WW0645	HSA-X-Human_IFNA14-X-HSA_(X=Linker2)
WW0646	HSA-X-Human_IFNA14-X-HSA_(X=Linker3)
WW0647	Mouse_IFNA11
WW0648	Human_IFNA14
WW0781	HSA-X-Human_IFNA2b_T129E-X-HSA_(X=Linker2)
WW0782	HSA-X-Human_IFNA14_N95D-X-HSA_(X=Linker2)

WW0783	HSA-X-Human_IFNA14_N25D_S27P_N95D-X-HSA_(X=Linker2)
WW0784	Human_IFNA2b_T129E
WW0785	Human_IFNA14_N95D
WW0786	Human_IFNA14_N25D_S27P_N95D
WW0815	mAlb-X-mIFNa1-X-mAlb_(X=Linker3)
WW0816	mAlb-X-mIFNa11-X-mAlb_(X=Linker3)
WW0817	anti-HSA-X-mIFNa1-X-mAlb_(X=Linker3)
WW0818	anti-HSA-X-mIFNa11-mAlb_(X=Linker3)
WW0819	mAlb-X-mIFNa1-X-anti-HSA_(X=Linker3)
WW0820	mAlb-X-mIFNa11-anti-HSA_(X=Linker3)
WW0821	Alb-X-Human_IFNA2b-X-Alb_(X=Linker3)
WW0822	Alb-X-Human_IFNA14-X-Alb_(X=Linker3)
WW0831	Alb-X-IFNa8-X-Alb_(X=Linker3)
WW0832	Alb-X-IFNa16-Alb_(X=Linker3)
WW0833	Anti-HSA-X-IFNa8-X-anti-HSA_(X=Linker3)
WW0834	Anti-HSA-X-IFNa16-X-anti-HSA_(X=Linker3)
WW0737	HSA-X-mIFNb-X-HSA_(X=Linker2)
WW0738	HSA-X-mIFNb-X-HSA_(X=Linker3)
WW0739	HSA-X-mIFNb_C38S-X-HSA_(X=Linker2)
WW0740	HSA-X-mIFNb_C38S-X-HSA_(X=Linker3)
WW0741	HSA-X-Human_IFNB-X-HSA_(X=Linker2)
WW0742	HSA-X-Human_IFNB-X-HSA_(X=Linker3)
WW0743	HSA-X-Human_IFNB_C38S-X-HSA_(X=Linker2)
WW0744	HSA-X-Human_IFNB_C38S-X-HSA_(X=Linker3)
WW0745	Mouse_IFNb
WW0746	Mouse_IFNb_C38S
WW0747	Human_IFNB
WW0748	Human_IFNAB_C38S
WW0787	HSA-X-Human_IFNB_N101Q-X-HSA_(X=Linker2)
WW0788	HSA-X-Human_IFNB_N101Q_C38S-X-HSA_(X=Linker2)
WW0789	Human_IFNB_N101Q
WW0790	Human_IFNB_C38S_N101Q
WW0729	IL2-L-anti-HSA-LL-Heavy_blocker_Fab_(Blocker=VH-CH1_non-cleavable)
WW0734	IL2-X-anti-HSA-LL-Heavy_blocker_Fab_(Blocker=VH-CH1_X=Linker1)
WW0735	IL2-X-anti-HSA-LL-Heavy_blocker_Fab_(Blocker=VH-CH1_X=Linker2)
WW0736	IL2-X-anti-HSA-LL-Heavy_blocker_Fab_(Blocker=VH-CH1_X=Linker3)
WW0792	Anti-IL-2_Fab_Heavy_IgG1_Blocker_His_tag
WW0061	IL2-X-anti-HSA_Fusion_(X=Linker1)

ACP293 (WW0237)	3TOW69sdAb
ACP294 (WW0238)	3TOW85sdAb
ACP295 (WW0239)	2TOW91sdAb
ACP315 (WW0368)	Hu2TOW91_A
ACP316 (WW0369)	Hu2TOW91_B
ACP317 (WW0370)	Hu2TOW91_C
ACP318 (WW0371)	Hu2TOW91_D
ACP319 (WW0372)	HE_LM_2TOW91
ACP320 (WW0373)	HE_L_2TOW91
ACP321 (WW0374)	Hu3TOW85_A
ACP322 (WW0375)	Hu3TOW85_B
ACP323 (WW0376)	Hu3TOW85_C
ACP324 (WW0377)	Hu3TOW85_D
ACP325 (WW0378)	HE_LM_3TOW85
ACP326 (WW0379)	HE_L_3TOW85
ACP327 (WW0380)	HE_LM_R45L_3TOW85
ACP328 (WW0381)	Hu3TOW69_A
ACP329 (WW0382)	Hu3TOW69_B
ACP330 (WW0383)	Hu3TOW69_C

ACP331 (WW0384)	Hu3TOW69_D
ACP332 (WW0385)	Hu3TOW69_E
ACP333 (WW0386)	HE_LM_3TOW69
ACP334 (WW0387)	HE_L_3TOW69
ACP335 (WW0388_	HE_LM_R45L_3TOW69
ACP360 (WW0438)	Vh-Vl_3xG4S_A46S ("3xG4S" is disclosed as SEQ ID NO: 452)
ACP361(WW 0439)	Vh-Vl_3xG4S_A46S ("3xG4S" is disclosed as SEQ ID NO: 452)
ACP362 (WW0440)	Vh-X-Vl_X=Linker2
ACP363 (WW0441)	Vh-X-Vl_X=Linker2_A46S
ACP364 (WW0442)	VHVL.F2.high.A02_Vh-Vl_3xG4S ("3xG4S" is disclosed as SEQ ID NO: 452)
ACP365 (WW0443)	VHVL.F2.high.A02_Vh-Vl_3xG4S_A46S ("3xG4S" is disclosed as SEQ ID NO: 452)
ACP366(WW 0444)	VHVL.F2.high.A02_Vh-X-Vl_X=Linker2
ACP367 (WW0445)	VHVL.F2.high.A02_Vh-X-Vl_X=Linker2_A46S
ACP368 (WW0446)	VHVL.F2.high.F03_Vh-Vl_3xG4S ("3xG4S" is disclosed as SEQ ID NO: 452)
ACP369 (WW0449)	VHVL.F2.high.F03_Vh-X-Vl_X=Linker2
ACP370 (WW0450)	VHVL.F2.high.C07_Vh-Vl_3xG4S ("3xG4S" is disclosed as SEQ ID NO: 452)
ACP380 (WW0522)	Kappa_blocker_Fab_(Blocker=Kappa)
ACP381 (WW0523)	Kappa_blocker_Fab_(Blocker=VHVL.F2.high.A02_A46S_Kappa)
ACP382 (WW0524)	Kappa_blocker_Fab_(Blocker=VHVL.F2.high.F03_Kappa)

ACP434 (WW0576)	IL2-X-anti-HSA-LX-Blocker1-L-Blocker2_(Blocker1=VHVL.F2.high.F03_Vh_Q105C_Vl_A43C_Blocker2=Hu2TOW91_B_X=Linker2)
ACP435 (WW0577)	Kappa_blocker1_Fab-L-blocker2_(Blocker1=VHVL.F2.high.A02_A46S_Kappa_Blocker2=Hu2TOW91_A)
ACP436 (WW0578)	Kappa_blocker1_Fab-L-blocker2_(Blocker1=VHVL.F2.high.A02_A46S_Kappa_Blocker2=Hu2TOW91_B)
ACP437 (WW0579)	Kappa_blocker1_Fab-L-blocker2_(Blocker1=VHVL.F2.high.F03_Kappa_Blocker2=Hu2TOW91_A)
ACP438 (WW0580)	Kappa_blocker1_Fab-L-blocker2_(Blocker1=VHVL.F2.high.F03_Kappa_Blocker2=Hu2TOW91_B)
ACP448 (WW0590)	Kappa_blocker_Fab_(Blocker=VHVL.F2.high.C07_A46S_Kappa)
ACP449 (WW0591)	Kappa_blocker_Fab_(Blocker=VHVL.F2.high.C07_A46L_Kappa)
ACP450 (WW0592)	Kappa_blocker_Fab_(Blocker=VHVL.F2.high.A02_A46L_Kappa)

Sequence Table

SEQ ID NO.	Name	Sequence
1	Human IL-2	MYRMQLLSCI ALSLALVTNS APTSSSTKKT QLQLEHLLLD LQMILNGINN YKNPKLTRML TFKFYMPKKA TELKHLQCLE EELKPLEEVL NLAQSKNFHL RPRDLISNIN VIVLELKGSE TTFMCEYADE TATIVEFLNR WITFCQSIISTLT
2	Human serum albumin	MKWVTFISLL FLFSSAYSRG VFRRDAHKSE VAHRFKDLGE ENFKALVLIA FAQYLQQCPF EDHVKLVNEV TEFAKTCVAD ESAENCDKSL HTLFGDKLCT VATLRETYGE MADCCAKQEP ERNECFLQHK DDNPNLPRLV RPEVDVMCTA FHDNEETFLK KYLYEIARRH PYFYAPELLF FAKRYKAAFT ECCQAADKAA CLLPKLDELR DEGKASSAKQ RLKCASLQKF GERAFKAWAV ARLSQRFPKA EFAEVSKLVT DLTKVHTECC HGDLLECADD RADLAKYICE NQDSISSKLK ECCEKPLLEK SHCIAEVEND EMPADLPSLA ADFVESKDVC KNYAEAKDVF LGMFLYEYAR RHPDYSVVLL LRLAKTYETT LEKCCAAADP HECYAKVFDE FKPLVEEPQN LIKQNCELFE QLGEYKFQNA LLVRYTKKVP QVSTPTLVEV SRNLGKVGSK CCKHPEAKRM PCAEDCLSVF LNQLCVLHEK TPVSDRVTKC CTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIKKQTALV ELVKHK PKATKEQLKAVMDDFAAFVEKCCKADDKET CFAEEGKKLVAASQAALGL

45	ACP12 (IL2 fusion protein)	QVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITR GGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYW GKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkk atelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSG GPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQ APGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTA VYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsEVQLVESGGGLVQPGGSLR LSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRD NAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGS GGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGK APKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYT FGGGTKVEIKHHHHHH
46	ACP13 (IL2 fusion protein)	QVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITR GGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYW GKGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNS LRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDI QMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFR YSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKgg ggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGK GLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYC TIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginny knpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetati veflnrwitfcqsiistltHHHHHH
47	ACP14 (IL2 fusion protein) WW0045	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCK ASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSL QPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsggggsggggsggggsSG GPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleee lkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGM KGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLE WVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIG GSLSVSSQGTLVTVSSHHHHHH
48	ACP15 (IL2 fusion protein) (WW0047)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCK ASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSL QPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsggggsggggsggggsEV

		QLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGS GRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQ GTLVTVSSggggsggggsggggsSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginn yknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetat iveflnrwitfcqsiistltHHHHHHH
49	ACP16 (IL2 fusion protein) (WW0048)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLV QPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRG RFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVS SGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ YYTYPYTFGGGTKVEIKHHHHHH
50	ACP17 (IL2 fusion protein)	QVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITR GGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYW GKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkk atelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSG GPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQ APGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTA VYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsSGGPGPAG MKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGL EWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR DSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVG DRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGT DFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
51	ACP18 (IL2 fusion protein)	QVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITR GGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYW GKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkk atelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSG GPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQ APGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTA VYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsEVQLVESG GGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPD TVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTT VTVSSsggpgpagmkglpgsDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ YYTYPYTFGGGTKVEIKHHHHHH

52	ACP19 (IL2 fusion protein)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSggggsggggs ggggsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVR QAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTA VYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFS GSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggg gsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSI SGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSV SSQGTLVTVSSggggsggggsggggsQVQLQESGGGLVQAGGSLRLSCAASGRIFSID IMSWYRQAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSL KPEDTGVYYCNALYGTDYWGKGTQVTVSSHHHHHH**
53	ACP20 (IL2 fusion protein) (WW0056)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSP DTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGT TVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTN VGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATY YCQQYYTYPYTFGGGTKVEIKHHHHHH
54	ACP21 (IL2 fusion protein) (WW0057)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSggggsggggs ggggsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVR QAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTA VYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFS GSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
55	ACP22 (IL2 fusion protein)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSggggsggggs ggggsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVR QAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTA VYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFS GSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKSGGPGPAGM KGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLE WVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIG GSLSVSSQGTLVTVSSggggsggggsggggsQVQLQESGGGLVQAGGSLRLSCAASG RIFSIDIMSWYRQAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYL QMNSLKPEDTGVYYCNALYGTDYWGKGTQVTVSSHHHHHH

56	ACP23 (IL2 fusion protein)	QVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWYRQTPGKQREFVAIIN SVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDTAVYVCNRNFDRIY WGQGTQVTVSSSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASG FTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLY LQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGG GGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYS ASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKV EIKggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQ PGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPG PAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkple evlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH
57	ACP24 (IL2 fusion protein) (WW0074)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCK ASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSL QPEDFATYYCQQYYTYPYTFGGGTKVEIKSGGPGPAGMKGLPGSaptssstkktqlql ehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelk gsettfmceyadetativeflnrwitfcqsiistltHHHHHH
58	ACP25 (IL2 fusion protein) (WW0075)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCK ASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSL QPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsggggsggggsggggsSG GPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleee lkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH
59	ACP26 (IL2 fusion protein)	QVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITR GGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYW GKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkk atelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSG GPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQ APGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTA VYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsQVQLQQSGAELVRPGT SVKVSCKASGYAFTNYLIEWVKQRPGQGLEWIGVINPGSGGTNYNEKFKGKA TLTADKSSSTAYMQLSSLTSDDSAVYFCARWRGDGYYAYFDVWGAGTTVTV SSggggsggggsggggsDIVLTQSPASLAVSLGQRATISCKASQSVDYDGDSYMNWY QQKPGQPPKLLIYAASNLESGIPARFSGSGSGTDFTLNIHPVEEEDAATYYCQQ SNEDPYTFGGGTKLEIKHHHHHHHEPEA

60	ACP27 (IL2 fusion protein)	QVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITR GGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYW GKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkk atelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSG GPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQ APGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTA VYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsDIVLTQSPASLAVSLG QRATISCKASQSVDYDGDSYMNWYQQKPGQPPKLLIYAASNLESGIPARFSGS GSGTDFTLNIHPVEEEDAATYYCQQSNEDPYTFGGGTKLEIKggggsggggsggggs QVQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWVKQRPGQGLEWIGVIN PGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSAVYFCARWRGDG YYAYFDVWGAGTTVTVSSHHHHHHHEPEA
61	ACP28 (IL2 fusion protein)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSggggsggggs ggggsggggsggggsQVQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWVKQRP GQGLEWIGVINPGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSAV YFCARWRGDGYYAYFDVWGAGTTVTVSSggggsggggsggggsDIVLTQSPASLAV SLGQRATISCKASQSVDYDGDSYMNWYQQKPGQPPKLLIYAASNLESGIPARF SGSGSGTDFTLNIHPVEEEDAATYYCQQSNEDPYTFGGGTKLEIKggggsggggsgg ggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSS ISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSV SSQGTLVTVSSggggsggggsggggsQVQLQESGGGLVQAGGSLRLSCAASGRIFSID IMSWYRQAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSL KPEDTGVYYCNALYGTDYWGKGTQVTVSSHHHHHHHEPEA
62	ACP29 (IL2 fusion protein)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSggggsggggs ggggsggggsggggsDIVLTQSPASLAVSLGQRATISCKASQSVDYDGDSYMNWYQ QKPGQPPKLLIYAASNLESGIPARFSGSGSGTDFTLNIHPVEEEDAATYYCQQS NEDPYTFGGGTKLEIKggggsggggsggggsQVQLQQSGAELVRPGTSVKVSCKASG YAFTNYLIEWVKQRPGQGLEWIGVINPGSGGTNYNEKFKGKATLTADKSSST AYMQLSSLTSDDSAVYFCARWRGDGYYAYFDVWGAGTTVTVSSggggsggggsg gggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVS SISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLS VSSQGTLVTVSSggggsggggsggggsQVQLQESGGGLVQAGGSLRLSCAASGRIFSI DIMSWYRQAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMN SLKPEDTGVYYCNALYGTDYWGKGTQVTVSSHHHHHHHEPEA
63	IL2Ra	10 20 30 40 50 MDSYLLMWGL LTFIMVPGCQ AELCDDDPPE IPHATFKAMA YKEGTMLNCE 60 70 80 90 100

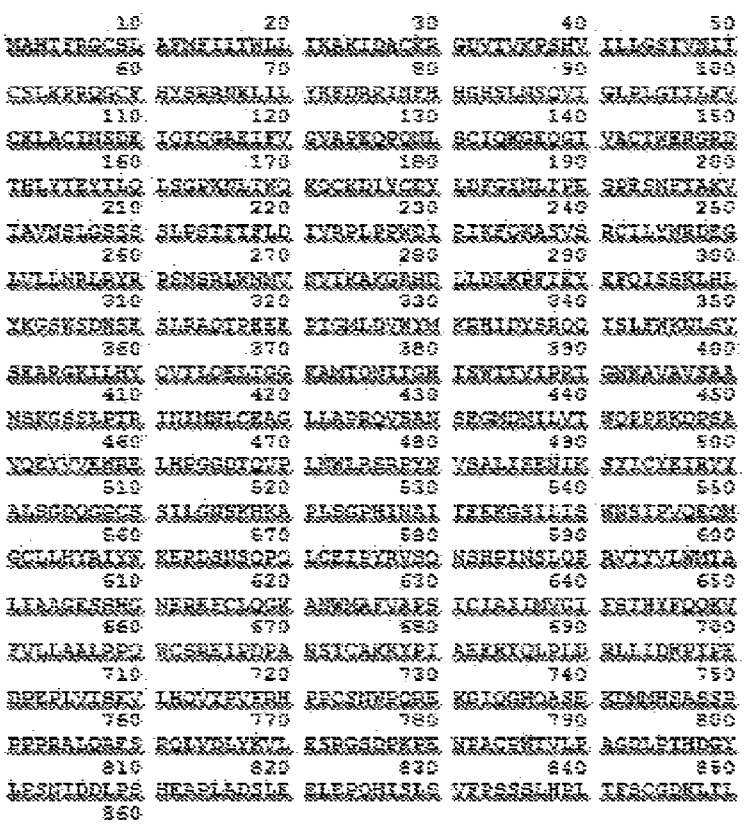
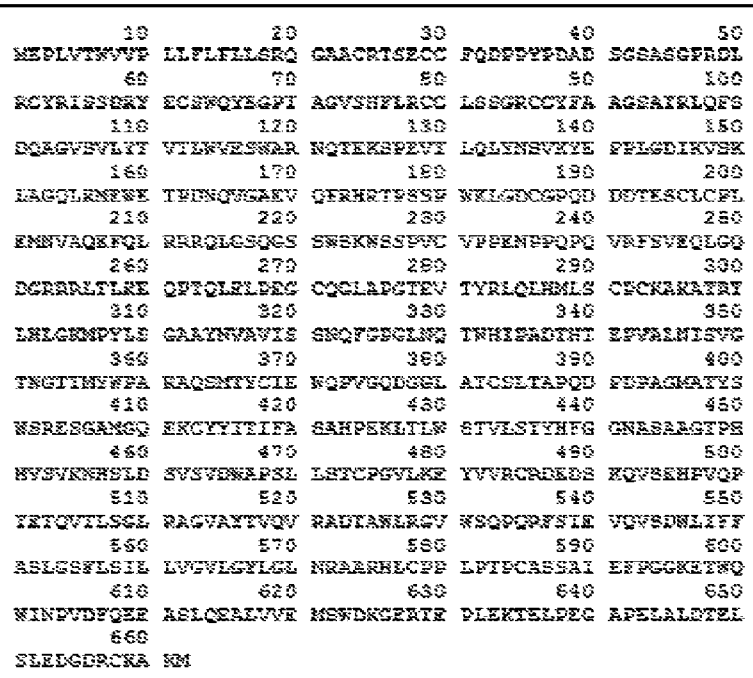
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64	IL2Rb	10 20 30 40 50 MAAPALSWRL PLLILLLPLA TSWASAAVNG TSQFTCFYNS RANISCVWSQ 60 70 80 90 100 DGALQDTSCQ VHAWPDRRRW NQTCELLPVS QASWACNLIL GAPDSQKLTT 110 120 130 140 150 VDIVTLRVLC REGVRWRVMA IQDFKPFENL RLMAPISLQV VHVETHRCNI 160 170 180 190 200 SWEISQASHY FERHLEFEAR TLSPGHTWEE APLLTLKQKQ EWICLETLTP 210 220 230 240 250 DTQYEFQVRV KPLQGEFTTW SPWSQPLAFR TKPAALGKDT IPWLGHLLVG 260 270 280 290 300 LSGAFGFIIL VYLLINCRNT GPWLKKVLKC NTPDPSKFFS QLSSEHGGDV 310 320 330 340 350 QKWLSSPFPS SSFSPGGLAP EISPLEVLER DKVTQLLLQQ DKVPEPASLS 360 370 380 390 400 SNHSLTSCFT NQGYFFFHLP DALEIEACQV YFTYDPYSEE DPDEGVAGAP 410 420 430 440 450 TGSSPQPLQP LSGEDDAYCT FPSRDDLLLF SPSLLGGPSP PSTAPGGSGA 460 470 480 490 500 GEERMPPSLQ ERVPRDWDPQ PLGPPTPGVP DLVDFQPPPE LVLREAGEEV 510 520 530 540 550 PDAGPREGVS FPWSRPPGQG EFRALNARLP LNTDAYLSLQ ELQGQDPTHL V
65	IL2Rg	10 20 30 40 50 MLKPSLPFTS LLFLQLPLLG VGLNTTILTP NGNEDTTADF FLTTMPTDSL 60 70 80 90 100 SVSTLPLPEV QCFVFNVEYM NCTWNSSSEP QPTNLTLHYW YKNSDNDKVQ 110 120 130 140 150 KCSHYLFSEE ITSGCQLQKK EIHLYQTFVV QLQDPREPRR QATQMLKLQN 160 170 180 190 200 LVIPWAPENL TLHKLSESQL ELNWNNRFLN HCLEHLVQYR TDWDHSWTEQ 210 220 230 240 250 SVDYRHKFSL PSVDGQKRYT FRVRSRFNPL CGSAQHWSEW SHPIHWGSNT 260 270 280 290 300 SKENPFLFAL EAVVISVGSM GLIISLLCVY FWLERTMPRI PTLKNLEDLV 310 320 330 340 350 TEYHGNFSAW SGVSKGLAES LQPDYSERLC LVSEIPPKGG ALGEGPGASP 360 CNQHSPYWAP PCYTLKPET

66	ACP04 (human p40/murine p35 IL12 fusion protein)	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryysssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssaHHHHHH
67	ACP05 (human p40/murine p35 IL12 fusion protein)	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryysssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnasHHHHHH
68	ACP06 (human p40/murine p35 IL12 fusion protein)	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSggggsggggsggggsggggsggggsggggsSGG PGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkef gdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssd pqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlql kplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsew asvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktcl plelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelm qslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSEVQ LVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSSHHHHHHHEPEA
69	ACP07 (human p40/murine p35 IL12 fusion protein)	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSggggsggggsggggsggggsggggsggggsSGG PGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkef gdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssd pqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlql kplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsew asvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktcl

		plelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelm qslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSEVQ LVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSSggggsggggsggggsQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMA WYRQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKP EDTAVYVCNRNFDRIYWGQGTQVTVSSHHHHHHEPEA
70	ACP08 (human p40/murine p35 IL12 fusion protein)	QVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWYRQTPGKQREFVAIIN SVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDTAVYVCNRNFDRIY WGQGTQVTVSSggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSN TVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEA DYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPG RSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKG RFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSggg gsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemv vltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktf lrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpiev mvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevswcypdtwstphsyfsltfcvqvqgkskrekkdr vftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttdd mvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkm yqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrv mgylssaSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFG MSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNS LRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHEPEA
71	ACP09 (human p40/murine p35 IL12 fusion protein)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTV KWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADY YCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRS LRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRF TISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSggggsg gggsggggsggggsggggsggggsSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltc dtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktflrce aknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmv davhklkyenytssffirdiikpdppknlqlkplknsrqvevswcypdtwstphsyfsltfcvqvqgkskrekkdrvftd ktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvkt areklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtef qainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgyls saHHHHHHEPEA

72	ACP10 (human p40/murine p35 IL12 fusion protein)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtl dqssevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcw wlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyeny tssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrkna sisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctа edidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnh qqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPA GMKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCS GSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAIT GLQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVES GGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNK YYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGT MVTVSSHHHHHHEPEA
73	ACP11 (human p40/murine p35 IL12 fusion protein)	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSggggsggggsggggsggggsggggsggg gsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLI YYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLF GTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYG MHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMN SLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSggggsggggsggggsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS HHHHHHEPEA

74	IL12 p40 human (Uniprot Accession No. P29460)	10 20 30 40 50 MCHQQLVISW FSLVFLASPL VAIWELKKDV YVVELDWYPD APGEMVVLTC 60 70 80 90 100 DTPEEDGITW TLDQSSEVLG SGKTLTIQVK EFGDAGQYTC HKGGEVLSHS 110 120 130 140 150 LLLLHKKEDG IWSTDILKDQ KEPKNKTFLR CEAKNYSGRF TCWWLTTIST 160 170 180 190 200 DLTFSVKSSR GSSDPQGVTC GAATLSAERV RGDNKEYEYS VECQEDSACP 210 220 230 240 250 AAEESLPIEV MVDAVHKLKY ENYTSSFFIR DIIKPDPPKN LQLKPLKNSR 260 270 280 290 300 QVEVSWEYPD TWSTPHSYFS LTFCVQVQGK SKREKKDRVF TDKTSATVIC 310 320 RKNASISVRA QDRYYSSSWS EWASVPCS
75	IL12 p35 mouse (Uniprot Accession No. P43431)	10 20 30 40 50 MCQSRYLLFL ATLALLNHLS LARVIPVSGP ARCLSQSRNL LKTTDDMVKT 60 70 80 90 100 AREKLKHYSC TAEDIDHEDI TRDQTSTLKT CLPLELHKNE SCLATRETSS 110 120 130 140 150 TTRGSCLPPQ KTSLMMTLCL GSIYEDLKMY QTEFQAINAA LQNHNHQQII 160 170 180 190 200 LDKGMLVAID ELMQSLNHNG ETLRQKPPVG EADPYRVKMK LCILLHAFST 210 RVVTINRVMG YLSSA

76	IL12Rb-2	
77	IL12Rb-1	

78	IL-12 p35 human (Uniprot accession no. P29459)	10 20 30 40 50 MCHQQLVISW FSLVFLASPL VAIWELKKDV YVVELDWYPD APGEMVVLTC 60 70 80 90 100 DTPEEDGITW TLDQSSEVLG SGKTLTIQVK EFGDAGQYTC HKGGEVLSHS 110 120 130 140 150 LLLLHKKEDG IWSTDILKDQ KEPKNKTFLR CEAKNYSGRF TCWWLTTIST 160 170 180 190 200 DLTFSVKSSR GSSDPQGVTC GAATLSAERV RGDNKEYEYS VECQEDSACP 210 220 230 240 250 AAEESLPIEV MVDAVHKLKY ENYTSSFFIR DIIKPDPPKN LQLKPLKNSR 260 270 280 290 300 QVEVSWEYPD TWSTPHSYFS LTFCVQVQGK SKREKKDRVF TDKTSATVIC 310 320 RKNASISVRA QDRYYSSSWS EWASVPCS
79	IL-12 p40 mouse (Uniprot accession no. P43432)	10 20 30 40 50 MCPQKLTISW FAIVLLVSPL MAMWELEKDV YVVEVDWTPD APGETVNLTC 60 70 80 90 100 DTPEEDDITW TSDQRHGVIG SGKTLTITVK EFLDAGQYTC HKGGETLSHS 110 120 130 140 150 HLLLHKKENG IWSTEILKNF KNKTFLKCEA PNYSGRFTCS WLVQRNMDLK 160 170 180 190 200 FNIKSSSSSP DSRAVTCGMA SLSAEKVTLD QRDYEKYSVS CQEDVTCPTA 210 220 230 240 250 EETLPIELAL EARQQNKYEN YSTSFFIRDI IKPDPPKNLQ MKPLKNSQVE 260 270 280 290 300 VSWEYPDSWS TPHSYFSLKF FVRIQRKKEK MKETEEGCNQ KGAFLVEKTS 310 320 330 TEVQCKGGNV CVQAQDRYYN SSCSKWACVP CRVRS
80	ACP01 (mouse IFNg fusion protein)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdm kilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslr krkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFG MSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNS LRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH
81	ACP02 (mouse IFNg	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdm kilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslr

	fusion protein)	krkrsrcSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisf ylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcS GGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSHHHHHHH
82	ACP03 (mouse IFNg fusion protein)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdm kilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslr krkrsrcggggsggggsggggshgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevl kdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGP AGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGK GLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYC TIGGSLSVSSQGTLVTVSSHHHHHH
83	Human IFN-g (Uniprot Accession No. P01579)	10 20 30 40 50 MKYTSYILAF QLCIVLGSLG CYCQDPYVKE AENLKKYFNA GHSDVADNGT 60 70 80 90 100 LFLGILKNWK EESDRKIMQS QIVSFYFKLF KNFKDDQSIQ KSVETIKEDM 110 120 130 140 150 NVKFFNSNKK KRDDFEKLTN YSVTDLNVQR KAIHELIQVM AELSPAAKTG 160 KRKRSQMLFR GRRASQ
84	Mouse IFN-g (Uniprot Accession No. P01580)	10 20 30 40 50 MNATHCILAL QLFLMAVSGC YCHGTVIESL ESLNNYFNSS GIDVEEKSLF 60 70 80 90 100 LDIWRNWQKD GDMKILQSQI ISFYLRLFEV LKDNQAISNN ISVIESHLIT 110 120 130 140 150 TFFSNSKAKK DAFMSIAKFE VNNPQVQRQA FNELIRVVHQ LLPESSLRKR KRSRC
85	ACP30 (mouse IFNg fusion protein)	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidv eekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpq vqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLR LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGM KGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvie

		shlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPG SEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSHHHHHH
86	ACP31 (mouse IFNa1 fusion protein)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvd aqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhri tvylrekkhspcawevvraevwralsssanvlgrlreekSGGPGPAGMKGLPGSEVQLVESGGGL VQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESV KGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHH HHHHEPEA
87	ACP32 (mouse IFNa1 fusion protein)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvd aqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhri tvylrekkhspcawevvraevwralsssanvSGGPGPAGMKGLPGSEVQLVESGGGLVQPGN SLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFT ISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHE PEA
88	IFNgR1	10 20 30 40 50 MALLFLLGLV MQGVSRAENG TADLGPSGVS TVTNVTIESY MMNPIVYWEY 60 70 80 90 100 QIMPQVPVFT VEVKQYGVKN SEWIDACINI SHHYCNISDH VGDPSNSLMV 110 120 130 140 150 EVKARVEQKE SAYAKSKFFA VERDGKIGPP KLDIRKEKKQ IMIDIFHPSV 160 170 180 190 200 FVNGDEQEVD YDPETTCYIR VYNVYVRMNG SEIQYKILTQ KEDDCDEIQC 210 220 230 240 250 QLAIFVSSLN SQYCVSAEGV LHVNGVTIEK SKEVCITIFN SSIKGSLNIS 260 270 280 290 300 VGAALLLELV LSLVFICFYI KKINPLKEKS IILPWELISV VPEATLEIKE 310 320 330 340 350 ESKTVSLITP VQPFSLEKEV VCEEPLSEAT VPGSHTEDNP GKVEHTEELS 360 370 380 390 400 SIIEVVTIEK NIPDVVPGEH LTDIERESSS PLESNQSEPG SIALNSYSSR 410 420 430 440 450 NCSESDHSRM GFDIDSSCLE SESSLSDSEF PENNKGEIKT EGQELITVIK 460 470 480 APTSPGYEKP HVLVDLIVDD SGKESLIGYR PTEDSKEFS

89	IFNgR2	10 20 30 40 50 MRPTLLWSLL LLLGVFAAAA ARPPDPLSQL PAPQHPKIRL YNAEQVLSWE 60 70 80 90 100 PVALSNGTRP VVYQVQFKYT DSKRFTADTM SIGVNCTQIT ATECDFTAAS 110 120 130 140 150 PSAGFPMDFN VTLRLRARLG ALHSAWVTMP WFQHYRNVTV GPPENIEVIP 160 170 180 190 200 GEGSLIIRFS SPFDIADTST AFFCYYVHYW EKGGIQQVKG PFRSNSISLD 210 220 230 240 250 NLKPSRVYCL QVQAQLLWNK SNIFRVGHLS NISCYEIMAD ASTELQQVIL 260 270 280 290 300 ISVGTFSLLS VLAGACFFLV LKYRGLIKYW FHTPPSIPLQ IEEYLKDPTQ 310 320 330 PILEALDKDS SPKDDVWDSV SIISFPEKEQ EDVLQTL
90	ACP51 Mouse IFG fusion protein	QVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITR GGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYW GKGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKF GMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMN SLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnn yfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsi akfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLV QPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVK GRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHH HHH
91	ACP52 Mouse IFG fusion protein	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdm kilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslr krkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFG MSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNS LRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGSEVQLVESG GGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLY AESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTV SSggggsggggsggggsQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQA PGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVY YCNALYGTDYWGKGTQVTVSSHHHHHH
92	ACP53 Mouse IFG fusion protein	eahkseiahryndlgeqhfkglvliafsqylqkcsydehaklvqevtdfaktcvadesaancdkslhtlfgdklcaipnlr enygeladcctkqepernecflqhkddnpslppferpeaeamctsfkenpttfmghylhevarrhpyfyapellyyaeq yneiltqccaeadkesclpkldgvkekalvssvrqrmkcssmqkfgerafkawavarlsqtfpnadfaeitklatdltkv nkecchgdllecaddraelakymcenqatisskiqtccdkpllkkahclsevehdtmpadlpaiaadfvedqevckny aeakdvflgtflyeysrrhpdysvsllirlakkyeatlekccaeanppacygtvlaefqplveepknlvktncdlyeklgey gfqnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcllhektpvsehvtkccsgslver rpcfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkpkataeqlktvmddfaqfldtcckaadkdt cfstegpnlvtrckdalaSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgd

		mkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpes slrkrkrsrcSGGPGPAGMKGLPGSeahkseiahryndlgeqhfkglvliafsqylqkcsydehaklvqevtd faktcvadesaancdkslhtlfgdklcaipnlrenygeladcctkqepernecflqhkddnpslppferpeaeamctsfk enpttfmghylhevarrhpyfyapellyyaeqyneiltqccaeadkescltpkldgvkekalvssvrqrmkcssmqkf gerafkawavarlsqtfpnadfaeitklatdltkvnkecchgdllecaddraelakymcenqatisskiqtccdkpllkka hclsevehdtmpadlpaiaadfvedqevcknyaeakdvflgtflyeysrrhpdysvsllrlakkyeatlekccaeanpp acygtvlaefqplveepknlvktncdlyeklgeygfqnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcv edylsailnrvcllhektpvsehvtkccsgslverrpcfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelv khkpkataeqlktvmddfaqfldtcckaadkdtcfstegpnlvtrckdalaHHHHHH
93	ACP54 Mouse IFG fusion protein	eahkseiahryndlgeqhfkglvliafsqylqkcsydehaklvqevtdfaktcvadesaancdkslhtlfgdklcaipnlr enygeladcctkqepernecflqhkddnpslppferpeaeamctsfkenpttfmghylhevarrhpyfyapellyyaeq yneiltqccaeadkescltpkldgvkekalvssvrqrmkcssmqkfgerafkawavarlsqtfpnadfaeitklatdltkv nkecchgdllecaddraelakymcenqatisskiqtccdkpllkkahclsevehdtmpadlpaiaadfvedqevcknya eakdvflgtflyeysrrhpdysvsllrlakkyeatlekccaeanppacygtvlaefqplveepknlvktncdlyeklgey gfqnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcllhektpvsehvtkccsgslver rpcfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkpkataeqlktvmddfaqfldtcckaadkdt cfstegpnlvtrckdalaSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgd mkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpes slrkrkrsrcggggsggggsggggshgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlf evlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGP GPAGMKGLPGSeahkseiahryndlgeqhfkglvliafsqylqkcsydehaklvqevtdfaktcvadesaanc dkslhtlfgdklcaipnlrenygeladcctkqepernecflqhkddnpslppferpeaeamctsfkenpttfmghylhev arrhpyfyapellyyaeqyneiltqccaeadkescltpkldgvkekalvssvrqrmkcssmqkfgerafkawavarlsq tfpnadfaeitklatdltkvnkecchgdllecaddraelakymcenqatisskiqtccdkpllkkahclsevehdtmpadl paiaadfvedqevcknyaeakdvflgtflyeysrrhpdysvsllrlakkyeatlekccaeanppacygtvlaefqplvee pknlvktncdlyeklgeygfqnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcllhe ktpvsehvtkccsgslverrpcfsaltvdetyvpkefkactftfhsdictlpekekqikkqtalaclvkhkpkataeqlktv mddfaqfldtcckaadkdtcfstegpnlvtrckdalaHHHHHH
94	ACP50 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisv ieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcggggsggggsggggshgtv iesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskak kdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSHHHHHH
95	ACP55	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidv eeksIfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpq vqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLR

	Mouse IFG fusion protein	LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGM KGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvie shlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPG SEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSHHHHHHH
96	ACP56 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYVCNRNFDRIYWGQGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisv ieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLP GSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSS ISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSV SSQGTLVTVSSHHHHHHHEPEA
97	ACP57 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidv eekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpq vqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLR LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgggg sQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWYRQTPGKQREFVAIIN SVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDTAVYVCNRNFDRIY WGQGTQVTVSSHHHHHHHEPEA
98	ACP58 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidv eekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpq vqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldi wrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnel irvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAAS GFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTT LYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsQVQLQ ESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITRGGTISY DDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYWGKGTQV TVSSHHHHHHHEPEA
99	ACP59 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYVCNRNFDRIYWGQGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisv ieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLP GShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittff snskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQ LVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSSHHHHHHHEPEA
100	ACP60 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidv eekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpq vqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldi wrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnel irvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAAS

		GFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTT LYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsQVQLQ ESGGGLAQAGGSLSLSCAASGFTVSNSVMAWYRQTPGKQREFVAIINSVGSTN YADSVKGRFTISRDNAKNTVYLQMNNLKPEDTAVYVCNRNFDRIYWGQGTQ VTVSSHHHHHHHEPEA
101	ACP61 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidv eekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpq vqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldi wrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnel irvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAAS GFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTT LYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVRQAPGKGLEWVSAISGSGGS TYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARGVGAFRPYRKH EWGQGTLVTVSRggggsggggsggggsSSELTQDPAVSVALGQTVRITCQGDSLRSY YASWYQQKPGQAPVLVIYGKNNRPSGIPDRFSGSSSGNTASLTTTGAQAEDEA DYYCNSSPFEHNLVVFGGGTKLTVLHHHHHHHEPEA
102	ACP63 Anti-FN CGS-2 scFv	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVR QAPGKGLEWVSAISGSGGSTYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARGVGAFRPYRKHEWGQGTLVTVSRggggsggggsggggsSSELTQDPAV SVALGQTVRITCQGDSLRSYYASWYQQKPGQAPVLVIYGKNNRPSGIPDRFSG SSSGNTASLTTTGAQAEDEADYYCNSSPFEHNLVVFGGGTKLTVLHHHHHHE PEA
103	ACP69 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidv eekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpq vqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLR LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGM KGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvie shlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcHHHHHHEPEA
104	ACP70 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarchgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlk dnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGP AGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGK GLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYC TIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldi wrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnel irvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAAS GFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTT LYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHEPEA
105	ACP71 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarchgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlk dnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGP AGMKGLPGSEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLV QEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQE PERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPY FYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKC SSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLE CADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPA IAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEAT LEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILV RYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCL LHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTL PEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCF STEGPNLVTRCKDALASGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrn wqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirv

		vhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEAHKSEIAHRYNDLGEQHFKGLVLIAF SQYLQKCSYDEHAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPN LRENYGELADCCTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPT TFMGHYLHEVARRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDG VKEKALVSSVRQRMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLAT DLTKVNKECCHGDLLECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAH CLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPD YSVSLLLRLAKKYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNC DLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQ RLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYV PKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDF AQFLDTCCKAADKDTCFSTEGPNLVTRCKDALAHHHHHHHEPEA
106	ACP72 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDE HAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADC CTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVA RRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQ RMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCH GDLLECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMP ADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAK KYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGF QNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAI LNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFH SDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAA DKDTCFSTEGPNLVTRCKDALASGGPGPAGMKGLPGShgtviesleslnnyfnssgidvee kslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvq rqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEAHKSEIAHRYNDLGEQHFK GLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESAANCDKSLHTLFGD KLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCT SFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEILTQCCAEADKESCL TPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAVARLSQTFPNADFA EITKLATDLTKVNKECCHGDLLECADDRAELAKYMCENQATISSKLQTCCDK PLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYE YSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKN LVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCC TLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALT VDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVKHKPKATAEQLK TVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALASGGPGPAGMKGL PGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlitt ffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcHHHHHHHEPEA
107	ACP73 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDE HAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADC CTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVA RRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQ RMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCH GDLLECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMP ADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAK KYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGF QNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAI LNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFH SDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAA DKDTCFSTEGPNLVTRCKDALASGGPGPAGMKGLPGShgtviesleslnnyfnssgidvee kslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvq rqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEAHKSEIAHRYNDLGEQHFK GLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESAANCDKSLHTLFGD KLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCT SFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEILTQCCAEADKESCL TPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAVARLSQTFPNADFA EITKLATDLTKVNKECCHGDLLECADDRAELAKYMCENQATISSKLQTCCDK PLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYE

		YSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKN LVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCC TLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALT VDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVKHKPKATAEQLK TVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALASGGPGPAGMKGL PGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlitt ffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEA HKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCV ADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHK DDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAE QYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAF KAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKY MCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEV CKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPP ACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVS TPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEH VTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQ TALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTR CKDALAHHHHHHEPEA
108	ACP74 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDE HAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADC CTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVA RRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQ RMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCH GDLLECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMP ADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAK KYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGF QNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAI LNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFH SDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAA DKDTCFSTEGPNLVTRCKDALASGGPGPAGMKGLPGShgtviesleslnnyfnssgidvee kslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvq rqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSggggsEAHKSEIAHRYNDLGEQ HFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESAANCDKSLHTL FGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSLPPFERPEAEA MCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEILTQCCAEADK ESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAVARLSQTFPN ADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKYMCENQATISSKLQT CCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEAKDVFLGT FLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTVLAEFQPLVE EPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAARNLGRVG TKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGSLVERRPCF SALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVKHKPKATAE QLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALAggggsSGGPGP AGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisn nisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMK GLPGSEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTD FAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNEC FLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPEL LYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKF GERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRA ELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVE DQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAE ANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKA PQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTP VSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQI KKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPN LVTRCKDALAHHHHHHEPEA

109	ACP75 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDE HAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADC CTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVA RRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQ RMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCH GDLLECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMP ADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAK KYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGF QNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAI LNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFH SDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAA DKDTCFSTEGPNLVTRCKDALASGGPGPAGMKGLPGShgtviesleslnnyfnssgidvee kslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvq rqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSggggsggggsEAHKSEIAHRYND LGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESAANCDKS LHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSLPPFERPE AEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEILTQCCAE ADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAVARLSQT FPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKYMCENQATISSKL QTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEAKDVFL GTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTVLAEFQPL VEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAARNLGR VGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGSLVERR PCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVKHKPKA TAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALAggggsgggg sSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfe vlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGP GPAGMKGLPGSEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAK LVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTK QEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRH PYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRM KCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDL LECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADL PAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYE ATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAI LVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRV CLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDIC TLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDT CFSTEGPNLVTRCKDALAHHHHHHHEPEA
110	ACP78 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggshgtviesleslnnyfnssgidveekslfld iwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafne lirvvhqllpesslrkrkrsrcggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTF SKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYL QMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggshgtviesleslnn yfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsia kfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSHHHHHHEP EA
111	ACP134 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidv eeksIfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpq vqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLR LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGM KGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvie

		shlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPG SEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSggggsggggsggggsQVQLQESGGGLAQAGGSLSLSCAASGFTVSNS VMAWYRQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNN LKPEDTAVYVCNRNFDRIYWGQGTQVTVSSHHHHHHHEPEA
112	ACP135 Mouse IFG fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYVCNRNFDRIYWGQGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisv ieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLP GSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSS ISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSV SSQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgd mkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpes slrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKF GMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMN SLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHHEPEA
113	ACP34 Mouse IL-12 fusion protein	mdmrvpaqllgllllwlrgarcrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclp lelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmq slnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSmwele kdvyvvevdwtpdapgetvnltcdtpeedditwtsdqrhgvigsgktltitvkefldagqytchkggetlshshlllhkke ngiwsteilknfknktflkceapnysgrftcswlvqrnmdlkfnikssssspdsravtcgmaslsaekvtldqrdyekys vscqedvtcptaeetlpielalearqqnkyenystsffirdiikpdppknlqmkplknsqvevsweypdswstphsyfsl kffvriqrkkekmketeegcnqkgaflvektstevqckggnvcvqaqdryynssccskwacvpcrvrsHHHHHH
114	ACP35 Mouse IL-12 fusion protein	mdmrvpaqllgllllwlrgarcrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclp lelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmq slnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaggggsggggsggggsSGGPGPAG MKGLPGSggggsggggsggggsmwelekdvyvvevdwtpdapgetvnltcdtpeedditwtsdqrhgvigsg ktltitvkefldagqytchkggetlshshlllhkkengiwsteilknfknktflkceapnysgrftcswlvqrnmdlkfnik sssssspdsravtcgmaslsaekvtldqrdyekysvscqedvtcptaeetlpielalearqqnkyenystsffirdiikpdpp knlqmkplknsqvevsweypdswstphsyfslkffvriqrkkekmketeegcnqkgaflvektstevqckggnvcv qaqdryynssccskwacvpcrvrsHHHHHH
115	ACP36 Mouse IL-12 fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGSmwelekdvyvvevdwtpd apgetvnltcdtpeedditwtsdqrhgvigsgktltitvkefldagqytchkggetlshshlllhkkengiwsteilknfkn ktflkceapnysgrftcswlvqrnmdlkfnikssssspdsravtcgmaslsaekvtldqrdyekysvscqedvtcptaee tlpielalearqqnkyenystsffirdiikpdppknlqmkplknsqvevsweypdswstphsyfslkffvriqrkkekm keteegcnqkgaflvektstevqckggnvcvqaqdryynssccskwacvpcrvrsggggsggggsggggsrvipvsg parclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgsclppqktsl mmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmkl cillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSC AASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNA KTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHH
116	ACP37 Mouse IL-12 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGSmwelekdvyvvevdwtpdapgetvnltcdtpeedditwtsdqrhgvigsgktltitvkefldagqytc hkggetlshshlllhkkengiwsteilknfknktflkceapnysgrftcswlvqrnmdlkfnikssssspdsravtcgmas lsaekvtldqrdyekysvscqedvtcptaeetlpielalearqqnkyenystsffirdiikpdppknlqmkplknsqvevs weypdswstphsyfslkffvriqrkkekmketeegcnqkgaflvektstevqckggnvcvqaqdryynssccskwac vpcrvrsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktcl plelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelm

		qslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSEVQ LVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSSHHHHHH
117	ACP79 Mouse IL-12 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGSmwelekdvyvvevdwtpdapgetvnltcdtpeedditwtsdqrhgvigsgktltitvkefldagqytc hkggetlshshlllhkkengiwsteilknfknktflkceapnysgrftcswlvqrnmdlkfnikssssspdsravtcgmas lsaekvtldqrdyekysvscqedvtcptaeetlpielalearqqnkyenystsffirdiikpdppknlqmkplknsqvevs weypdswstphsyfslkffvriqrkkekmketeegcnqkgaflvektstevqckggnvcvqaqdryynsscskwac vpcrvrsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktcl plelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelm qslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSEVQ LVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSSHHHHHH
118	ACP80 Mouse IL-12 fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGSmwelekdvyvvevdwtpd apgetvnltcdtpeedditwtsdqrhgvigsgktltitvkefldagqytchkggetlshshlllhkkengiwsteilknfkn ktflkceapnysgrftcswlvqrnmdlkfnikssssspdsravtcgmaslsaekvtldqrdyekysvscqedvtcptaee tlpielalearqqnkyenystsffirdiikpdppknlqmkplknsqvevsweypdswstphsyfslkffvriqrkkekm keteegcnqkgaflvektstevqckggnvcvqaqdryynsscskwacvpcrvrsggggsggggsggggsrvipvsg parclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgsclppqktsl mmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmkl cillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSC AASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNA KTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsQV QLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITRGG TISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYWGK GTQVTVSSHHHHHH
119	ACP91 Chimeric IL-12 fusion protein	mdmrvpaqllgllllwlrgarciwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqv kefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrg ssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppkn lqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryysssws ewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlkt clplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidel mqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaggggsggggsggggsggggsgggg sggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQ QLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQS YDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLS CAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRD NSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSggggsggggsgg ggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSS ISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSV SSQGTLVTVSSHHHHHHHEPEA
120	ACP136 Chimeric IL-12 fusion protein	mdmrvpaqllgllllwlrgarciwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqv kefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrg ssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppkn lqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryysssws ewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlkt clplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidel mqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSgggg sggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVK WYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYY CQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSL

		RLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTI SRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH HEPEA
121	ACP138 Chimeric IL-12 fusion protein	mdmrvpaqllgllllwlrgarciwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqv kefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrg ssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppkn lqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssssws ewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlkt clplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidel mqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSggg gsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVK WYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYY CQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSL RLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTI SRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSggggsggg gsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEW VSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGS LSVSSQGTLVTVSSggggsggggsggggsQVQLQESGGGLAQAGGSLSLSCAASGFT VSNSVMAWYRQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYL QMNNLKPEDTAVYVCNRNFDRIYWGQGTQVTVSSHHHHHHHEPEA
122	ACP139 Chimeric IL-12 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYYCNRNFDRIYWGQGTQVTVSSggggsggggsggggsiwelkkdvyvveldwypdapgem vvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknk tflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpie vmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkd rvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttdd mvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkm yqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrv mgylssaSGGPGPAGMKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVS GAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFS GSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggg gsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLE WVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKT HGSHDNWGQGTMVTVSSggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCA ASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAK TTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHHEPEA
123	ACP140 Chimeric IL-12 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYYCNRNFDRIYWGQGTQVTVSSSGGPGPAGMKGLPGSiwelkkdvyvveldwyp dapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshslllhkkedgiwstdilkdq kepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpa aeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgk skrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsr nllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsi yedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrv vtinrvmgylssaSGGPGPAGMKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQP PSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPD RFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLgggg sggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKG LEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC KTHGSHDNWGQGTMVTVSSggggsggggsggggsEVQLVESGGGLVQPGNSLRLSC AASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNA KTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHHEPEA
124	ACP38 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcaptsssttkktqlqlehlllldlqmilnginnykpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGL EWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR DSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVG

		DRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGT DFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsEVQLV ESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDT LYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLV TVSSggggsggggsggggsQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSHHHHHHH
125	ACP39 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSSGGPGPAGMKGLPGSEVQLVESGGGLVQ PGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPG PAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPG KGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYY CARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSA SVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSG SGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKSGGPGPAGMKGL PGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknf hlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH**
126	ACP40 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcelcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswd nqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcv qgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsclvtttdfqiqtemaatmets iftteyqggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSaptssstkktqlqlehlllld lqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettf mceyadetativeflnrwitfcqsiistltHHHHHH
127	ACP41 IL-2 fusion protein (WW0076)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSggggsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfr riksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppwen eateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpese tsclvtttdfqiqtemaatmetsiftteyqHHHHHH
128	ACP42 IL-2 fusion protein (WW0078)	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggselcdddppeiphatfkamaykegtmln ceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcre pppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqasp egrpesetsclvtttdfqiqtemaatmetsiftteyqggggsggggsggggsggggsggggsggggsSGGPGPAG MKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnl aqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH
129	ACP43 IL-2 fusion protein (WW0079)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSggggsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfr riksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppwen eateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpese tsclvtttdfqiqtemaatmetsiftteyqggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCA ASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAK TTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH
130	ACP44 IL-2 fusion protein (WW0080)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSggggsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfr riksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppwen eateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpese tsclvtttdfqiqtemaatmetsiftteyqSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLR LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH
131	ACP45	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGSEVQLVESGGGLVQP

	IL-2 fusion protein WW0046	GGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRF TISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSG GGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQ KPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYY TYPYTFGGGTKVEIKggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSa ptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprd lisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH
132	ACP46 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSggggsggggsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCA ASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKN SLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSsggpgpagmkglp gsDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSA SFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEI Kggggsggggsggggs EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQA PGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAV YYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsQVQLQESGGGLVQAGGSLRL SCAASGRIFSIDIMSWYRQAPGKQRELVARITRGGTISYDDSVKGRFTISRDNA KNTVYLQMNSLKPEDTGVYYCNALYGTDYWGKGTQVTVSSHHHHHH
133	ACP47 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAAS GFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTT LYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsgg gggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGD RVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
134	ACP48 IL-2 fusion protein (WW0054)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGL EWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR DSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVG DRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGT DFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsEVQLV ESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDT LYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLV TVSSHHHHHH
135	ACP49 IL-2 fusion protein (WW0055)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSggggsggggsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCA ASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKN SLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGG SGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKA LIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGG TKVEIKggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSW VRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPE DTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH
136	ACP92 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlqm ilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmce yadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSC AASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNA KTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH

137	ACP93 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSgsgsgsgsgsgsgsgsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgsgsgsgsgsgs gsgsQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVAR ITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTD YWGKGTQVTVSSgsgsgsgsgsgsgsgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK SGGPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcl eeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH
138	ACP94 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSgsgsgsgsgsgsgsgsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgsgsgsgsgsgs gsgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVA AIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNW DALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTI TCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLT ISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKSGGPGPAGMKGLPGSaptssstk ktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninv ivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH
139	ACP95 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSgsgsgsgsgsgsgsgsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnl aqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH
140	ACP96 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlq milnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfm ceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLL SCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRD NAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH
141	ACP97 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnl aqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGS EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSHHHHHH
142	ACP99 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAAS GFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTT LYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH

143	ACP100 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltHHHHHH
144	ACP101 (WW0061) IL-2 fusion protein	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGL EWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTI GGSLSVSSQGTLVTVSSHHHHHH
145	ACP102 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlq milnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfm ceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRL SCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRD NAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgggg ggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPG KGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYY CARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSA SVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSG SGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
146	ACP103 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSggggsggggsggggsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCA ASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKN SLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGG SGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKA LIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGG TKVEIKggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSW VRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPE DTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsQVQLQESGGGLAQAGG SLSLSCAASGFTVSNSVMAWYRQTPGKQREFVAIINSVGSTNYADSVKGRFTIS RDNAKNTVYLQMNNLKPEDTAVYVCNRNFDRIYWGQGTQVTVSSHHHHHH
147	ACP104 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYVCNRNFDRIYWGQGTQVTVSSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfy mpkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsii stltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMS WVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLR PEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsEVQL VESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYT YSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWG QGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNV GTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDF ATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
148	ACP105 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVR QAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTA VYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFS GSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggg gsggggsggggsggggsSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrml tfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitf cqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFG MSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNS LRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsQVQLQESGGGLA QAGGSLSLSCAASGFTVSNSVMAWYRQTPGKQREFVAIINSVGSTNYADSVK

		GRFTISRDNAKNTVYLQMNNLKPEDTAVYVCNRNFDRIYWGQGTQVTVSSH HHHHH
149	ACP106 IL-2 fusion protein	mdmrvpaqllglllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYVCNRNFDRIYWGQGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGL EWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCAR DSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVG DRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGT DFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsggggsgg ggsggggsSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnykpkltrmltfkfympkk atelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltH HHHHH
150	ACP107 IL-2 fusion protein	mdmrvpaqllglllwlrgarcEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVR QAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTA VYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFS GSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggg gsggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQA PGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAV YYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilng innyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyad etativeflnrwitfcqsiistltggggsggggsggggsQVQLQESGGGLAQAGGSLSLSCAASGFT VSNSVMAWYRQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYL QMNNLKPEDTAVYVCNRNFDRIYWGQGTQVTVSSHHHHHH
151	ACP108 IL-2 fusion protein	mdmrvpaqllglllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltSGGPGPAGMKGLPGSrgetgpaaPGSEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsg gggsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQ APGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAV YYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSL SASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSG SGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
152	ACP117 Anti-FN CGS-2 scFv	mdmrvpaqllglllwlrgarcEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYAMSWVR QAPGKGLEWVSAISGSGGSTYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARGVGAFRPYRKHEWGQGTLVTVSRggggsggggsggggsSSELTQDPAV SVALGQTVRITCQGDSLRSYYASWYQQKPGQAPVLVIYGKNNRPSGIPDRFSG SSSGNTASLTTTGAQAEDEADYYCNSSPFEHNLVVFGGGTKLTVLHHHHHHE PEA
153	ACP118 NARA1 Vh/Vl non-cleavable	mdmrvpaqllglllwlrgarcQVQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWV KQRPGQGLEWIGVINPGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSD DSAVYFCARWRGDGYYAYFDVWGAGTTVTVSSggggsggggsggggsDIVLTQSP ASLAVSLGQRATISCKASQSVDYDGDSYMNWYQQKPGQPPKLLIYAASNLES GIPARFSGSGSGTDFTLNIHPVEEEDAATYYCQQSNEDPYTFGGGTKLEIKHHH HHHEPEA
154	ACP119 NARA1 Vh/Vl cleavable	mdmrvpaqllglllwlrgarcQVQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWV KQRPGQGLEWIGVINPGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSD DSAVYFCARWRGDGYYAYFDVWGAGTTVTVSSSGGPGPAGMKGLPGSDIVL TQSPASLAVSLGQRATISCKASQSVDYDGDSYMNWYQQKPGQPPKLLIYAAS NLESGIPARFSGSGSGTDFTLNIHPVEEEDAATYYCQQSNEDPYTFGGGTKLEI KHHHHHHEPEA

155	ACP120 NARA1 Vl/Vh non-cleavable	mdmrvpaqllgllllwlrgarcDIVLTQSPASLAVSLGQRATISCKASQSVDYDGDSYMN WYQQKPGQPPKLLIYAASNLESGIPARFSGSGSGTDFTLNIHPVEEEDAATYYC QQSNEDPYTFGGGTKLEIKggggsggggsggggsQVQLQQSGAELVRPGTSVKVSCK ASGYAFTNYLIEWVKQRPGQGLEWIGVINPGSGGTNYNEKFKGKATLTADKS SSTAYMQLSSLTSDDSAVYFCARWRGDGYYAYFDVWGAGTTVTVSSHHHHHH HEPEA
156	ACP121 NARA1 Vl/Vh cleavable	mdmrvpaqllgllllwlrgarcDIVLTQSPASLAVSLGQRATISCKASQSVDYDGDSYMN WYQQKPGQPPKLLIYAASNLESGIPARFSGSGSGTDFTLNIHPVEEEDAATYYC QQSNEDPYTFGGGTKLEIKSGGPGPAGMKGLPGSQVQLQQSGAELVRPGTSV KVSCKASGYAFTNYLIEWVKQRPGQGLEWIGVINPGSGGTNYNEKFKGKATL TADKSSSTAYMQLSSLTSDDSAVYFCARWRGDGYYAYFDVWGAGTTVTVSS HHHHHHHEPEA
157	ACP124 IL-2 fusion protein (WW0159)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsg gggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVS SISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLS VSSQGTLVTVSSHHHHHHHEPEA
158	ACP132 IL-2 fusion protein (WW0177)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsg gggsdahksevahrfkdlgeenfkalvliafaqylqqcpfedhvklvnevtefaktcvadesaencdkslhtlfgdklctv atlretygemadccakqepernecflqhkddnpnlprlvrpevdvmctafhdneetflkkylyeiarrhpyfyapellff akrykaafteccqaadkaacllpkldelrdegkassakqrlkcaslqkfgerafkawavarlsqrfpkaefaevsklvtdlt kvhtecchgdllecaddradlakyicenqdsisskllkeccekpllekshciaevendempadlpslaadfveskdvckn yaeakdvflgmflyeyarrhpdysvvllrlaktyettlekccaaadphecyakvfdefkplveepqnlikqncelfeqlg eykfqnallvrytkkvpqvstptlvevsrnlgkvgskcckhpeakrmpcaedylsvvlnqlcvlhektpvsdrvtkcct eslvnrrpcfsalevdetyvpkefnaetftfhadictlsekerqikkqtalvelvkhkpkatkeqlkavmddfaafvekcc kaddketcfaeegkklvaasqaalglHHHHHHHEPEA
159	ACP141 IL-2 fusion protein (WW0178)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsg gggsdahksevahrfkdlgeenfkalvliafaqylqqcpfedhvklvnevtefaktcvadesaencdkslhtlfgdklctv atlretygemadccakqepernecflqhkddnpnlprlvrpevdvmctafhdneetflkkylyeiarrhpyfyapellff akrykaafteccqaadkaacllpkldelrdegkassakqrlkcaslqkfgerafkawavarlsqrfpkaefaevsklvtdlt kvhtecchgdllecaddradlakyicenqdsisskllkeccekpllekshciaevendempadlpslaadfveskdvckn yaeakdvflgmflyeyarrhpdysvvllrlaktyettlekccaaadphecyakvfdefkplveepqnlikqncelfeqlg eykfqnallvrytkkvpqvstptlvevsrnlgkvgskcckhpeakrmpcaedylsvvlnqlcvlhektpvsdrvtkcct eslvnrrpcfsalevdetyvpkefnaetftfhadictlsekerqikkqtalvelvkhkpkatkeqlkavmddfaafvekcc kaddketcfaeegkklvaasqaalglHHHHHHHEPEA
160	ACP142 IL-2 fusion protein (WW0179)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSdahksevahrfkdlgeenfkalvliafaqylqqcpfedhvklvnevtefaktcvadesaencdkslhtlf gdklctvatlretygemadccakqepernecflqhkddnpnlprlvrpevdvmctafhdneetflkkylyeiarrhpyf yapellffakrykaafteccqaadkaacllpkldelrdegkassakqrlkcaslqkfgerafkawavarlsqrfpkaefaev sklvtdltkvhtecchgdllecaddradlakyicenqdsisskllkeccekpllekshciaevendempadlpslaadfves kdvcknyaeakdvflgmflyeyarrhpdysvvllrlaktyettlekccaaadphecyakvfdefkplveepqnlikqn ceifeqlgeykfqnallvrytkkvpqvstptlvevsrnlgkvgskcckhpeakrmpcaedylsvvlnqlcvlhektpvs drvtkcctcslvnrrpcfsalevdetyvpkefnaetftfhadictlsekerqikkqtalvelvkhkpkatkeqlkavmddfa afvekcckaddketcfaeegkklvaasqaalglHHHHHHHEPEA
161	ACP144 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAG MKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGL EWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTI GGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsSGGPGPAGMKGLPG SEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAI DSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDA LDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITC KASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTIS

		SLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsQVQLQESGGG LAQAGGSLSLSCAASGFTVSNSVMAWYRQTPGKQREFVAIINSVGSTNYADS VKGRFTISRDNAKNTVYLQMNNLKPEDTAVYVCNRNFDRIYWGQGTQVTVS SHHHHHHHEPEA
162	ACP145 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYVCNRNFDRIYWGQGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilngi nnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyade tativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAAS GFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTT LYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsgg ggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNS LRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDI QMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFR YSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKH HHHHHEPEA
163	ACP146 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYVCNRNFDRIYWGQGTQVTVSSSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlq milnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfm ceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRL SCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRD NAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggs ggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASG FTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLY LQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGG GGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYS ASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKV EIKHHHHHHHEPEA
164	ACP133 (WW0196) IL-2-6xHis ("6xHis" disclosed as SEQ ID NO.: 354)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltHHHHHH
165	ACP147 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYRQAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTGVYYCNALYGTDYWGKGTQVTVSSHHHHHHEPEA
166	ACP148 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSggggsggggsggggsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAAS

		GFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTT LYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsgg ggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNS LRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDI QMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFR YSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKH HHHHHEPEA
167	ACP149 IL-2 fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLVQAGGSLRLSCAASGRIFSIDIMSWYR QAPGKQRELVARITRGGTISYDDSVKGRFTISRDNAKNTVYLQMNSLKPEDTG VYYCNALYGTDYWGKGTQVTVSSSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlq milnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfm ceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRL SCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRD NAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgggg ggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASG FTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLY LQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGG GGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYS ASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKV EIKHHHHHHHEPEA
168	ACP33 Mouse IFNa-fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrr lsplsclkdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvg vqefpltqedallavrkyfhritvylrekkhspcawevvraevwralsssanvSGGPGPAGMKGLPGSEV QLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGS GRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQ GTLVTVSSHHHHHHEPEA
169	ACP131 Mouse IFNa	mdmrvpaqllgllllwlrgarccdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvdaqqikkaqaipvlsel tqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhritvylrekkhspcawe vvraevwralsssanvlgrlreekHHHHHHEPEA
170	ACP125 Mouse IFNa-fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrr lsplsclkdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvg vqefpltqedallavrkyfhritvylrekkhspcawevvraevwralsssanvlgrlreekHHHHHHEPEA
171	ACP126 Mouse IFNa-fusion protein	mdmrvpaqllgllllwlrgarccdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvdaqqikkaqaipvlsel tqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhritvylrekkhspcawe vvraevwralsssanvlgrlreekSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSC AASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNA KTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHEPEA
172	ACP127 Mouse IFNa-fusion protein	mdmrvpaqllgllllwlrgarcEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDE HAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADC CTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVA RRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQ RMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCH GDLLECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMP ADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAK KYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGF QNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAI LNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFH

		SDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAA DKDTCFSTEGPNLVTRCKDALASGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrrls plsclkdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgv qefpltqedallavrkyfhritvylrekkhspcawevvraevwralsssanvlgrlreekSGGPGPAGMKGLP GSEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFA KTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFL QHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLY YAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGE RAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAEL AKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVED QEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEA NPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAP QVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPV SEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIK KQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNL VTRCKDALAHHHHHHEPEA
173	ACP128 Mouse IFNa-fusion protein	mdmrvpaqllgllllwlrgarcEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDE HAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADC CTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVA RRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQ RMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCH GDLLECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMP ADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAK KYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGF QNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAI LNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFH SDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAA DKDTCFSTEGPNLVTRCKDALASGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrrls plsclkdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgv qefpltqedallavrkyfhritvylrekkhspcawevvraevwralsssanvlgrlreekHHHHHHHEPEA
174	ACP129 Mouse IFNa-fusion protein	mdmrvpaqllgllllwlrgarccdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvdaqqikkaqaipvlsel tqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhritvylrekkhspcawe vvraevwralsssanvlgrlreekSGGPGPAGMKGLPGSEAHKSEIAHRYNDLGEQHFKGL VLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKL CAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSF KENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTP KLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEIT KLATDLTKVNKECCHGDLLECADDRAELAKYMCENQATISSKLQTCCDKPLL KKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSR RHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVK TNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLP EDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDE TYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVM DDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALAHHHHHHEPEA
175	ACP150 Mouse IFNa-fusion protein	mdmrvpaqllgllllwlrgarcQVQLQESGGGLAQAGGSLSLSCAASGFTVSNSVMAWY RQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMNNLKPEDT AVYYCNRNFDRIYWGQGTQVTVSSggggsggggsggggsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAG MKGLPGScdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskd ssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhritvylrekkhspcawevvraevwral sssanvlgrlreekSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTF SKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYL QMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHHEPEA
176	ACP151 Mouse IFNa-	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrr lsplsclkdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvg vqefpltqedallavrkyfhritvylrekkhspcawevvraevwralsssanvlgrlreekSGGPGPAGMKGLP

	fusion protein	GSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSS ISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSV SSQGTLVTVSSggggsggggsggggsQVQLQESGGGLAQAGGSLSLSCAASGFTVSN SVMAWYRQTPGKQREFVAIINSVGSTNYADSVKGRFTISRDNAKNTVYLQMN NLKPEDTAVYVCNRNFDRIYWGQGTQVTVSSHHHHHHHEPEA
177	ACP152 Mouse IFNa-fusion protein	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggscdlpqthnlrnkraltllvqmrrlsplscl kdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpl tqedallavrkyfhritvylrekkhspcawevvraevwralsssanvlgrlreekggggsggggsggggsEVQLVE SGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSHHHHHHHEPEA
178	ACP153 (WW0201) (IL-2 Conju-gate)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGL YAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLE WVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIG GSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEV QLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSS YTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDY WGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAS QNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQP EDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHHHEPEA
179	ACP154 (WW0202) (IL-2 Conju-gate)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpPGGPA GIGpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEW VSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGS LSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsggggssggpPGGPAGIGpgsEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVG TNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCQQYYTYPYTFGGGTKVEIKHHHHHHHEPEA
180	ACP155 (WW0203) (IL-2 Conju-gate)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpALFKSS FPpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWV SSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSL SVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVE SGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYS PDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQG TTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGT NVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQYYTYPYTFGGGTKVEIKHHHHHHHEPEA
181	ACP156 (WW0204) (IL-2 Conju-gate)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpPLAQK LKSSpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLE WVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIG GSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsggggssggpPLAQKLKSSpgsEV QLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSS YTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDY WGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAS QNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQP EDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHHHEPEA

182	ACP157 (WW0205) (IL-2 Conju-gate)	mdmrvpaqllgllllwlrgarcaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcle eelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpPGGPA GIGalfkssfpPLAQKLKSSpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGM SWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSL RPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggp PGGPAGIGalfkssfpPLAQKLKSSpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK HHHHHHHEPEA
183		Not assigned
184		Not assigned
185		Not assigned
186		Not assigned
187		Not assigned
188		Not assigned
189		Not assigned
190		Not assigned
191	Blocker 2 (IL2 blocker)	mdmrvpaqllgllllwlrgarcEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVR QAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTA VYYCARDSNWDALDYWGQGTTVTVSSggggsggggsggggsDIQMTQSPSSLSASV GDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSG TDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHHH
192	Blocker 12 (IL-12 blocker)	mdmrvpaqllgllllwlrgarcQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQ LPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSY DRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSC AASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDN SKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
193	Human_IF NA2b	cdlpqthslgsrrtlmllaqmrrislfsclkdrhdfgfpqeefgnqfqkaetipvlhemiqqifnlfstkdssaawdetlldk fytelyqqlndleacviqgvgvtetplmkedsilavrkyfqritlylkekkyspcawevvraeimrsfslstnlqeslrske HHHHHH**
194	ACP239-geneart	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssahhhhhh
195	3CYT5_sd Ab	QVQLQESGGGLVQAGGSLRLSCAASGRTFSSVYDMGWFRQAPGKDREFVARI TESARNTRYADSVRGRFTISRDNAKNTVYLQMNNLELEDAAVYYCAADPQT VVVGTPDYWGQGTQVTVSSAAAYPYDVPDYGSHHHHHH
196	ACP248	QSVLTQPPSVSGAPGQRVTISCtGSsSNIGSNTVKWYQQLPGTAPKLLIYgNDQR PSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPAyvFGTGTKVT VLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQ APGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
197	ACP249	QSVLTQPPSVSGAPGQRVTISCtGSsSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPAyvFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
198	ACP250	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK

		VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYaMHWV RQAPGKGLEWVAvIsYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCarHGSHDNWGQGTMVTVSSHHHHHH
199	ACP251	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYeGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
200	ACP252	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYAeSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
201	ACP253	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSqTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYeRYTHPALLFGTGTKV TVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVR QAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
202	ACP254	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSqTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYsRYTHPALLFGTGTKV TVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVR QAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
203	ACP255	QSVLTQPPSVSGAPGQRVTISCSGSeSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
204	ACP256	QSVLTQPPSVSGAPGQRVTISCSGSsSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
205	ACP257	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGdNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
206	ACP258	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGeNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
207	ACP259	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSdTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
208	ACP260	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSeTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
209	ACP261	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNdVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH

210	ACP262	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVdWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
211	ACP263	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVeWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
212	ACP264	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ dPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
213	ACP265	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ ePSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
214	ACP266	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPdGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
215	ACP267	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDeYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
216	ACP268	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTdPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
217	ACP269	QSVLTQPPSVSGAPGQRVTISCSGSeSNIGSNTVKWYQQLPGTAPKLLIYYNDQ ePSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDeYTHPALLFGTGTKV TVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVR QAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
218	ACP270	QSVLTQPPSVSGAPGQRVTISCSGSeSNIGSNdVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
219	ACP271	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFeSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
220	ACP272	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSeYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
221	ACP273	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSdYGMHWV

		RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
222	ACP274	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIeYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
223	ACP275	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIdYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
224	ACP276	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNdYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
225	ACP277	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNeYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
226	ACP278	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVeGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
227	ACP279	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSeDNWGQGTMVTVSSHHHHHH
228	ACP280	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIeYDGSNKYYADSVeGRFTISRDNSKNTLYLQMNSLRAED TAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
229	ACP281	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIeYDGSNKYYADSVeGRFTISRDNSKNTLYLQMNSLRAED TAVYYCKTHGSeDNWGQGTMVTVSSHHHHHH
230	ACP282	QSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQ RPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTK VTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWV RQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH
231	ACP283 (WW0617)	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrcealnysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcs
232	3TOW69sd Ab	QVQLQESGGGLVQTGGSLRLSCTTSGTIFSGYTMGWYRQAPGEQRELVAVISG GGDTNYADSVKGRFTISRDNTKDTMYLQMNSLKPEDTAVYYCYSREVTPPW KLYWGQGTQVTVSSAAAYPYDVPDYGSHHHHHH
233	3TOW85sd Ab	QVQLQESGGGLVQEGGSLRLSCAASERIFSTDVMGWYRQAAEKQRELVAVVS ARGTTNYLDAVKGRFTISRDNARNTLTLQMNDLKPEDTASYYCYVRETTSPW RIYWGQGTQVTVSSAAAYPYDVPDYGSHHHHHH

234	2TOW91sdAb	QVQLQESGGGLVQAGGSLRLSCAASGSIFSANAMGWYRQAPGKQRELVAVIS SGGSTNYADSVKGRFTISRDNAKNTVYLQMNSLKPEDTAVYYCMYSGSYYY TPNDYWGQGTQVTVSSAAAYPYDVPDYGSHHHHHH
235	ACP301	evqlvesggglvqpggslrlscaasgftfssytlawvrqapgkglewvaaidsssytyspdtvrgrftisrdnaknslylq mnslraedtavyycardsnwdaldywgqgttvtvssggggsggggsggggsdiqmtqspsslsasvgdrvtitckasq nvgtnvgwyqqkpgkapkaliysasfrysgvpsrfsgsgsgtdftltisslqpedfatyycqqyytypytfgggtkveik hhhhhh
236	Hu2TOW91_A	evqllesggglvqpggslrlscaasGSIFSANAMGwYrqapgkQReLvAVISSGGSTNYADSVK GrftisrdnskntVylqmnslraedtavyycMYSGSYYYTPNDYwgqgtlvtvssAAAYPYDVPD YGSHHHHHH**
237	Hu2TOW91_B	evqllesggglvqpggslrlscaasGSIFSANAMGwYrqapgkgleLvAVISSGGSTNYADSVKG rftisrdnskntVylqmnslraedtavyycMYSGSYYYTPNDYwgqgtlvtvssAAAYPYDVPDY GSHHHHHH**
238	Hu2TOW91_C	evqllesggglvqpggslrlscaasGSIFSANAMGwvrqapgkglewvsVISSGGSTNYADSVKGrf tisrdnskntlylqmnslraedtavyycMYSGSYYYTPNDYwgqgtlvtvssAAAYPYDVPDYGS HHHHHH**
239	Hu2TOW91_D	QvqllesggglvqpggslrlscaasGSIFSANAMGwYrqapgkQReLvAVISSGGSTNYADSVK GrftisrdnskntVylqmnslraedtavyycMYSGSYYYTPNDYwgqgtlvtvssAAAYPYDVPD YGSHHHHHH**
240	HE_LM_2TOW91	evqllesggglvqpggslrlscaasgSIfsANamGwYrqapgkgReLvAVissggstNyadsvkgrftisrdns kntVylqmnslraedtavyycMYSGSYYYTPNDYWgqgtlvtvssAAAYPYDVPDYGSHHH HHH**
241	HE_L_2TOW91	QvqllesggglvqAggslrlscaasgSIfsANamGwYrqapgkQReLvAVissggstNyadsvkgrftisrdn skntVylqmnslraedtavyycMYSGSYYYTPNDYwgqgtlvtvssAAAYPYDVPDYGSHHH HHH**
242	Hu3TOW85_A	evqllesggglvqpggslrlscaasERIFSTDVMGwYrqapgkQReLvAVVSARGTTNYLDAV KGrftisrdnskntlylqmnslraedtavyycYVRETTSPWRIYwgqgtlvtvssAAAYPYDVPDYG SHHHHHH**
243	Hu3TOW85_B	evqllesggglvqpggslrlscaasERIFSTDVMGwYrqapgkgleLvAVVSARGTTNYLDAVK GrftisrdnskntlylqmnslraedtavyycYVRETTSPWRIYwgqgtlvtvssAAAYPYDVPDYGS HHHHHH**
244	Hu3TOW85_C	evqllesggglvqpggslrlscaasERIFSTDVMGwvrqapgkglewvsVVSARGTTNYLDAVKG rftisrdnskntlylqmnslraedtavyycYVRETTSPWRIYwgqgtlvtvssAAAYPYDVPDYGSH HHHHH**
245	Hu3TOW85_D	QvqllesggglvqpggslrlscaasERIFSTDVMGwYrqapgkQReLvAVVSARGTTNYLDAV KGrftisrdnskntlylqmnslraedtavyycYVRETTSPWRIYwgqgtlvtvssAAAYPYDVPDYG SHHHHHH**
246	HE_LM_3TOW85	evqllesggglvqpggslrlscaasERIfsTDVmGwYrqapgkgReLvAVVsARgTtNyLdsvkgrftisr dnskntlylqmnslraedtavyycYVRETTSPWRIywgqgtlvtvssAAAYPYDVPDYGSHHHH HH**
247	HE_L_3TOW85	QvqllesggglvqEggslrlscaasERIfsTDVmGwYrqaAgkQReLvAVVsARgTtNyLdAvkgrf tisrdnskntlylqmnslraedtaSyycYVRETTSPWRIywgqgtlvtvssAAAYPYDVPDYGSHH HHHH**
248	HE_LM_R45L_3TOW85	evqllesggglvqpggslrlscaasERIfsTDVmGwYrqapgkgleLvAVVsARgTtNyLdsvkgrftisr dnskntlylqmnslraedtavyycYVRETTSPWRIywgqgtlvtvssAAAYPYDVPDYGSHHHH HH**
249	Hu3TOW69_A	evqllesggglvqpggslrlscaTsGTIFSGYTMGwYrqapgkQReLvAVISGGGDTNYADSV KGrftisrdnskDtMylqmnslraedtavyycYSREVTPPWKLYwgqgtlvtvssAAAYPYDVPD YGSHHHHHH**
250	Hu3TOW69_B	evqllesggglvqpggslrlscaTsGTIFSGYTMGwYrqapgkgleLvAVISGGGDTNYADSVK GrftisrdnskDtMylqmnslraedtavyycYSREVTPPWKLYwgqgtlvtvssAAAYPYDVPDY GSHHHHHH**

251	Hu3TOW69_C	evqllesggglvqpggslrlscaasGTIFSGYTMGwvrqapgkglewvsVISGGGDTNYADSVKGrftisrdnskntlylqmnslraedtavyycYSREVTPPWKLYwgqgtlvtvssAAAYPYDVPDYGSHHHHHH**
252	Hu3TOW69_D	QvqllesggglvqpggslrlscaTsGTIFSGYTMGwYrqapgkQReLvAVISGGGDTNYADSVKGrftisrdnskDtMylqmnslraedtavyycYSREVTPPWKLYwgqgtlvtvssAAAYPYDVPDYGSHHHHHH**
253	Hu3TOW69_E	evqllesggglvqpggslrlscaTsGTIFSGYTMGwYrqapgkQReLvAVISGGGDTNYADSVKGrftisrdnskntMylqmnslraedtavyycYSREVTPPWKLYwgqgtlvtvssAAAYPYDVPDYGSHHHHHH**
254	HE_LM_3TOW69	evqllesggglvqpggslrlscaTsgTIfsGyTmGwYrqapgkgReLvAVisGggDtNyadsvkgrftisrdnskntMylqmnslraedtavyycYSREVTPPWKLywgqgtlvtvssAAAYPYDVPDYGSHHHHHH**
255	HE_L_3TOW69	QvqllesggglvqTggslrlscaTsgTIfsGyTmGwYrqapgkQReLvAVisGggDtNyadsvkgrftisrdnskDtMylqmnslraedtavyycYSREVTPPWKLywgqgtlvtvssAAAYPYDVPDYGSHHHHHH**
256	HE_LM_R45L_3TOW69	evqllesggglvqpggslrlscaTsgTIfsGyTmGwYrqapgkgleLvAVisGggDtNyadsvkgrftisrdnskntMylqmnslraedtavyycYSREVTPPWKLywgqgtlvtvssAAAYPYDVPDYGSHHHHHH**
257	ACP363 (WW0441)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSggggsggggsggggsDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
258	ACP364 (WW0442)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSggggsggggsggggsDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
259	ACP367 (WW0445)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSggggsggggsggggsDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
260	ACP369 (WW0449)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSggggsggggsggggsDIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
261	ACP370 (WW0450)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSggggsggggsggggsDIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
262	ACP380 (WW0522)	DIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKrtvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekhkvyacevthqglsspvtksfnrgec
263	ACP381 (WW0523)	DIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKrtvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekhkvyacevthqglsspvtksfnrgec
264	ACP382 (WW0524)	DIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr

		tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgec
265	ACP435	DIQMTQSPSSLSASVGDRVTITCKARAEKLWSAVAWYQQKPGKAPKsLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgecggggsggggsggggsggggsggggsggggsevqllesgggl vqpggslrlsca asgsifsanamgwyrqapgkqrelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsy yytpndywgqgtlvtvss**
266	ACP436 (WW0578)	DIQMTQSPSSLSASVGDRVTITCKARAEKLWSAVAWYQQKPGKAPKsLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgecggggsggggsggggsggggsggggsggggsevqllesgggl vqpggslrlsca asgsifsanamgwyrqapgkglelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsy yytpndywgqgtlvtvss**
267	ACP437 (WW0579)	DIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSL RKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgecggggsggggsggggsggggsggggsggggsevqllesgggl vqpggslrlsca asgsifsanamgwyrqapgkqrelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsy yytpndywgqgtlvtvss**
268	ACP438 (WW0580)	DIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSL RKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgecggggsggggsggggsggggsggggsggggsevqllesgggl vqpggslrlsca asgsifsanamgwyrqapgkglelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsy yytpndywgqgtlvtvss**
269	ACP448 (WW0590)	DIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPGKAPKsLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgec**
270	ACP449 (WW0591)	DIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPGKAPKLLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgec**
271	ACP450 (WW0592)	DIQMTQSPSSLSASVGDRVTITCKARAEKLWSAVAWYQQKPGKAPKLLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgec**
272	ACP439 (WW0581)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggsggggsggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPG KAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGGGTKVEIK
273	ACP440 (WW0582)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggsggggsggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPG KAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIK

274	ACP441 (WW0583)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPG KAPKLLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIK
275	ACP442 (WW0584)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPG KAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGcGTKVEIK
276	ACP443 (WW0585)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPG KAPKLLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGcGTKVEIK
277	ACP444 (WW0586)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKSSEKLWANVAWYQQKPG KcPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIK
278	ACP445 (WW0587)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSsggpG PAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKA PKLLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTF GGGTKVEIK
279	ACP446 (WW0588)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG

		KAPKLLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIK
280	ACP447 (WW0589)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KAPKLLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGcGTKVEIK
281	ACP451 (WW0615)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpALFKSSFPpgsEVQLVESGGG LVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAES VKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgg ggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRL SCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDN AKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSG GGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKA PKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTF GGGTKVEIK**
282	ACP452 (WW0616)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpALFKSSFPpgsEVQLVESGGG LVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAES VKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgg ggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRL SCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDN AKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSG GGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGK APISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTF GGGTKVEIK**
283	ACP453 (WW0617)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpALFKSSFPpgsEVQLVESGGG LVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAES VKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgg ggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRL SCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNA KNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGG GGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAP KsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFG cGTKVEIK**
284	ACP454 (WW0618)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpALFKSSFPpgsEVQLVESGGG LVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAES VKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgg ggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRL SCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDN AKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSG GGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKc PKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTF GGGTKVEIK**
285	ACP455 (WW0619)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpALFKSSFPpgsEVQLVESGGG LVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAES VKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgg ggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRL SCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNA

		KNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGG GGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKA PISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFG cGTKVEIK**
441	ACP456 (WW0620)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpALFKSSFPpgsEVQLVESGGG LVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAES VKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgg ggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRL SCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDN AKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSG GGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKc PISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFG GGTKVEIK**
286	ACP457 (WW0621)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpALFKSSFPpgsEVQLVESGGG LVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAES VKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSgg ggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRL SCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDN AKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSastkgpsvfp lapsskstsggtaalgclvkdyfpepvtvswnsgaltsgvhtfpavlqssglyslssvvtvpssslgtqtyicnvnhkpsnt kvdkrvepksc**
287	ACP458 (WW0622)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp ALFKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkplee vlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggg gsggggsggggsggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNS LRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSastkgpsvfplapsskstsggtaalgclv kdyfpepvtvswnsgaltsgvhtfpavlqssglyslssvvtvpssslgtqtyicnvnhkpsntkvdkrvepksc**
288	ACP459 (WW0623)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp ALFKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkplee vlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggg gsggggsggggsggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNS LRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDI QMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRY SGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
289	ACP460 (WW0624)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp ALFKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkplee vlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggg gsggggsggggsggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNS LRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDI QMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRK SGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
290	ACP461 (WW0625)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp ALFKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkplee vlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggg gsggggsggggsggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY

		TLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSL RAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
291	ACP462 (WW0626)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp ALFKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkplee vlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggg gsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNS LRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKcPKALIYSASFRYS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
292	ACP463 (WW0627)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp ALFKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkplee vlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggg gsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSL RAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
293	ACP464 (WW0628)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp ALFKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkplee vlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggg gsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSY TLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNS LRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKcPISLIYSPSLRKS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
294	ACP465 (WW0629)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknqtqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpAL FKSSFPpgsaptssstkktqlqlehlllqlmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevln laqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggggsg gggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTL AWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSG VPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
295	ACP466 (WW0630)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknqtqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpAL FKSSFPpgsaptssstkktqlqlehlllqlmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevln laqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggggsg gggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTL AWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSG VPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
296	ACP467 (WW0631)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknqtqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpAL FKSSFPpgsaptssstkktqlqlehlllqlmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevln

		laqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggggsg gggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTL AWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSG VPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
297	ACP468 (WW0632)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpAL FKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevln laqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggggsg gggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTL AWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQMT QSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKcPKALIYSASFRYSGV PSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
298	ACP469 (WW0633)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpAL FKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevln laqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggggsg gggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTL AWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSG VPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
299	ACP470 (WW0634)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpAL FKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevln laqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggggsg gggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTL AWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQMT QSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKcPISLIYSPSLRKSGVP SRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
300	ACP471 (WW0642)	mdmrvpaqllgllllwlrgarcvprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswf vddvevhtaqtqpreeqfnstfrsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeq makdkvsltcmitdffpeditvewqwngqpaenyknqpimdtdgsyfvysklnvqksnweagntftcsvlheglh nhhtekslshspgksggpALFKSSFPpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympk katelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltg gggsggggsggggsggggsggggsggggssggpALFKSSFPpgsEVQLVESGGGLVQPGGSLR LSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRD NAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSastkgpsv fplapsskstsggtaalgclvkdyfpepvtvswnsgaltsgvhtfpavlqssglylsssvvtvpssslgtqtyicnvnhkps ntkvdkrvepksc**
301	ACP382 (WW0524)	DIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSL RKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslsstltlskadyekh kvyacevthqglsspvtksfnrgec**
302	ACP383 (WW0525)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS

		DIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK* *
303	ACP384 (WW0526)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetatveflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSD IQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKcPKALIYSASFR YSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
304	ACP385 (WW0527)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetatveflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKALIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK* *
305	ACP386 (WW0528)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetatveflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSD IQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKcPKALIYSASFR YSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
306	ACP387 (WW0529)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetatveflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSL RKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK* *
307	ACP388 (WW0530)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetatveflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSD IQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKcPISLIYSPSLRK SGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
308	ACP389 (WW0531)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp

		GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkqr elvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvss**
309	ACP390 (WW0532)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGcGTKVEIK**
310	ACP391 (WW0533)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK* *
311	ACP392 (WW0534)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqc qctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgy ralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftt eyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKcLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGD RVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
312	ACP393 (WW0535)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqc qctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgy ralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftt eyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDR VTITCKAREKLWSAVAWYQQKPGKcPKALIYSASFRYSGVPSRFSGSGSGTDF TLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
313	ACP394 (WW0536)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqc qctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgy ralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftt eyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED

		TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKcLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGD RVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
314	ACP395 (WW0537)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqc qctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgy ralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftt eyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDR VTITCKVTEKVWGNVAWYQQKPGKcPISLIYSPSLRKSGVPSRFSGSGSGTDFT LTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
315	ACP396 (WW0538)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqc qctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgy ralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftt eyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkqrelvavissggstnyadsvkgrftisr dnskntvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvss**
316	ACP397 (WW0539)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqc qctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgy ralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftt eyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkglelvavissggstnyadsvkgrftisr dnskntvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvss**
317	ACP398 (WW0540)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqc qctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgy ralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftt eyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGQGTTVTVSSastkgpsvfplapsskstsggtaalgclvkdyfpepvtvswnsgaltsgv htfpavlqssglyslssvvtvpssslgtqtyicnvnhkpsntkvdkrvepksc**
318	ACP399	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDS SSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALD YWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKA REKLWSAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQ PEDFATYYCQQYYTYPYTFGcGTKVEIKsggpGPAGLYAQpgsggggsggggsggggsg gggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPG KGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYY

		CTIGGSLSVSSQGTLVTVSSsggpGPAGLYAQpgstfkfympkkatelkhlqcleeelkpleevlnl aqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllldlqmiln ginnyknpkltrmlsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFS KFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQ MNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
319	ACP400	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKA REKLWSAVAWYQQKPGKcPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQ PEDFATYYCQQYYTYPYTFGGGTKVEIKsggpGPAGLYAQpgsggggsggggsgggsg gggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPG KGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYY CTIGGSLSVSSQGTLVTVSSsggpGPAGLYAQpgstfkfympkkatelkhlqcleeelkpleevlnl aqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllldlqmiln ginnyknpkltrmlsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFS KFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQ MNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
320	ACP401	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDS SSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALD YWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKV TEKVWGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQ PEDFATYYCQQYYTYPYTFGcGTKVEIKsggpGPAGLYAQpgsggggsggggsgggsg gggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPG KGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYY CTIGGSLSVSSQGTLVTVSSsggpGPAGLYAQpgstfkfympkkatelkhlqcleeelkpleevlnl aqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllldlqmiln ginnyknpkltrmlsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFS KFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQ MNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
321	ACP402	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKV TEKVWGNVAWYQQKPGKcPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQP EDFATYYCQQYYTYPYTFGGGTKVEIKsggpGPAGLYAQpgsggggsggggsgggsgg ggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGK GLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYC TIGGSLSVSSQGTLVTVSSsggpGPAGLYAQpgstfkfympkkatelkhlqcleeelkpleevlnla qsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllldlqmiln ginnyknpkltrmlsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFS KFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQ MNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
322	ACP403	evqllesggglvqpggslrlscaasgsifsanamgwyrqapgkqrelvavissggstnyadsvkgrftisrdnskntvyl qmnslraedtavyycmysgsyyytpndywgqgtlvtvssggpGPAGLYAQpgsggggsggggsgggsg gggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPG KGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYY CTIGGSLSVSSQGTLVTVSSsggpGPAGLYAQpgstfkfympkkatelkhlqcleeelkpleevlnl aqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllldlqmiln ginnyknpkltrmlsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFS KFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQ MNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
323	ACP404	evqllesggglvqpggslrlscaasgsifsanamgwyrqapgkglelvavissggstnyadsvkgrftisrdnskntvyl qmnslraedtavyycmysgsyyytpndywgqgtlvtvssggpGPAGLYAQpgsggggsggggsgggsg gggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPG KGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYY CTIGGSLSVSSQGTLVTVSSsggpGPAGLYAQpgstfkfympkkatelkhlqcleeelkpleevlnl aqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllldlqmiln ginnyknpkltrmlsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFS

		KFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQ MNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
324	ACP405	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSastkgpsvfplapsskstsggtaalgclvkdyfpepvtvswnsgaltsgvhtfpavlqss glyslssvvtvpssslgtqtyicnvnhkpsntkvdkrvepkscsgggpGPAGLYAQpgsggggsggggsggggs ggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAP GKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVY YCTIGGSLSVSSQGTLVTVSSsggpGPAGLYAQpgstfkfympkkatelkhlqcleeelkpleevl nlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllqlmi lnginnyknpkltrmlsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTF SKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYL QMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
325	ACP406 (WW0548)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknkqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpGP AGLYAQpgsaptssstkktqlqlehlllqlmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleev lnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgggg ggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYT LAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSL RAEDTAVYYCARDSNWDALDYWGQGTTVTVSSastkgpsvfplapsskstsggtaalgclvk dyfpepvtvswnsgaltsgvhtfpavlqssglyslssvvtvpssslgtqtyicnvnhkpsntkvdkrvepksc**
326	ACP407 (WW0549)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknkqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpGP AGLYAQpgsaptssstkktqlqlehlllqlmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleev lnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgggg ggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYT LAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKALIYSASFRYSG VPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
327	ACP408 (WW0550)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknkqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpGP AGLYAQpgsaptssstkktqlqlehlllqlmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleev lnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgggg ggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYT LAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSG VPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
328	ACP409 (WW0551)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknkqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpGP AGLYAQpgsaptssstkktqlqlehlllqlmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleev lnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgggg ggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYT LAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSL RAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKcPKALIYSASFRYS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
329	ACP410 (WW0552)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknkqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpGP AGLYAQpgsaptssstkktqlqlehlllqlmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleev lnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgggg ggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYT

		LAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLR AEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSG VPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIK**
330	ACP411 (WW0553)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknkqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpGP AGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleev lnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggggs ggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYT LAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSL RAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKcPISLIYSPSLRKS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
331	ACP412 (WW0554)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknkqpimdtdgsyfvysklnvqksnweagntftcsvlheglhnhhtekslshspgksggpGP AGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleev lnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsggggs ggggsggggssggpGPAGLYAQpgsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkqrelv avissggstnyadsvkgrftisrdnsknttvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvss**
332	ACP413 (WW0555)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyqggggsggggsgggg sggggsggggsggggsDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIKrtvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskd styslsstltlskadyekhkvyacevthqglsspvtksfnrgec**
333	ACP414 (WW0556)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyqggggsggggsgggg sggggsggggsggggsDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKP GKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGGGTKVEIKrtvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqds kdstyslsstltlskadyekhkvyacevthqglsspvtksfnrgec**
334	ACP415 (WW0557)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsgggg gsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQA PGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVY YCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLS ASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGS GSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIKggggsggggsggggsgg ggsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctg nsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgq mvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqte maatmetsiftteyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFS KFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQ MNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
335	ACP416 (WW0558)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsgggg gsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQA PGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVY YCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSA SVGDRVTITCKAREKLWSAVAWYQQKPGKcPKALIYSASFRYSGVPSRFSGSG SGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsggg gsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgns shsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqm vyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtem

		aatmetsiftteyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSK FGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQM NSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
336	ACP417 (WW0559)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQA PGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVY YCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLS ASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGS GSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIKggggsggggsggggsgg gggsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctg nsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgq mvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqte maatmetsiftteyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFS KFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQ MNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
337	ACP418 (WW0560)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQA PGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVY YCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSA SVGDRVTITCKVTEKVWGNVAWYQQKPGKcPISLIYSPSLRKSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggggsggggsggggsgggg sggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnss hsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmv yyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtema atmetsiftteyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKF GMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMN SLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
338	ACP419 (WW0561)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkqrelvavissggstnyad svkgrftisrdnsknvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvssggggsggggsggggsggg gsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgns shsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqm vyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtem aatmetsiftteyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSK FGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQM NSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
339	ACP420 (WW0562)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsggggsggggsggg gsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkglelvavissggstnyad svkgrftisrdnsknvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvssggggsggggsggggsggg gsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgns shsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqm vyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtem aatmetsiftteyqsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSK FGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQM NSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
340	ACP421 (WW0563)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIKg gggsggggsggggsggggsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlncec krgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepp

		pweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspeg rpesetsSlvtttdfqiqtemaatmetsiftteyqggggsgggsgggsgggsgggsgggsgggsgggsgpGPAGLY AQpgsaptssstkktqlqlehllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsk nfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistlt**
341	ACP422 (WW0564)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSD IQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKcPKALIYSASFR YSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKgg ggsggggsggggsggggsggggsggggsggggsggggsggggselcdddppeiphatfkamaykegtmlnceck rgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcreppp weneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegr pesetsSlvtttdfqiqtemaatmetsiftteyqggggsgggsgggsgggsgggsgggsgggsgggsgpGPAGLYA Qpgsaptssstkktqlqlehllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknf hlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistlt**
342	ACP423 (WW0565)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSL RKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGcGTKVEIKg gggsgggsgggsgggsgggsgggsgggsgggsgggsgggsgggselcdddppeiphatfkamaykegtmlncec krgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepp pweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspeg rpesetsSlvtttdfqiqtemaatmetsiftteyqggggsgggsgggsgggsgggsgggsgggsgggsgpGPAGLY AQpgsaptssstkktqlqlehllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsk nfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistlt**
343	ACP424 (WW0566)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGGSGGGGSGGGGSD IQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKcPISLIYSPSLRK SGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKggg gsgggsgggsgggsgggsgggsgggsgggsgggsgggsgggselcdddppeiphatfkamaykegtmlnceckr gfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppw eneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpe setsSlvtttdfqiqtemaatmetsiftteyqggggsgggsgggsgggsgggsgggsgggsgggsgpGPAGLYAQ pgsaptssstkktqlqlehllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfh lrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistlt**
344	ACP425 (WW0567)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkq relvavissggstnyadsvkgrftisrdnsknvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvssgggg sgggsgggsgggsgggsgggsgggsgggsgggsgggsgggselcdddppeiphatfkamaykegtmlnceckr gfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppw eneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpe setsSlvtttdfqiqtemaatmetsiftteyqggggsgggsgggsgggsgggsgggsgggsgggsgpGPAGLYAQ pgsaptssstkktqlqlehllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfh lrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistlt**
345	ACP426 (WW0568)	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkg lelvavissggstnyadsvkgrftisrdnsknvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvssgggg sggggsgggsgggsgggsgggsgggsgggsgggsgggsgggselcdddppeiphatfkamaykegtmlnceckrgf

		rriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppwe neateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpes etsSlvtttdfqiqtemaatmetsiftteyqggggsggggsggggsggggsggggsggggssggpGPAGLYAQp gsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeellkpleevlnlaqsknfhlr prdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistlt**
346	ACP427 (WW0569)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeellkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGcGTKVEIKggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsana mgwyrqapgkqrelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsyyytpndyw gqgtlvtvss**
347	ACP428 (WW0570)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeellkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KcPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIKggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsan amgwyrqapgkqrelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsyyytpndy wgqgtlvtvss**
348	ACP429 (WW0571)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeellkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKP GKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGcGTKVEIKggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsa namgwyrqapgkqrelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsyyytpndy wgqgtlvtvss**
349	ACP430 (WW0572)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeellkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKP GKcPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIKggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsan amgwyrqapgkqrelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsyyytpndy wgqgtlvtvss**
350	ACP431 (WW0573)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeellkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS

		LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGcGTKVEIKggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsana mgwyrqapgkglelvavissggstnyadsvkgrftisrdnsknttvylqmnslraedtavyycmysgsyyytpndyw gqgtlvtvss**
351	ACP432 (WW0574)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KcPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIKggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsan amgwyrqapgkglelvavissggstnyadsvkgrftisrdnsknttvylqmnslraedtavyycmysgsyyytpndy wgqgtlvtvss**
352	ACP433 (WW0575)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKP GKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGcGTKVEIKggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsa namgwyrqapgkglelvavissggstnyadsvkgrftisrdnsknttvylqmnslraedtavyycmysgsyyytpndy wgqgtlvtvss**
353	ACP434 (WW0576)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKP GKcPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIKggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlscaasgsifsan amgwyrqapgkglelvavissggstnyadsvkgrftisrdnsknttvylqmnslraedtavyycmysgsyyytpndy wgqgtlvtvss**
265	ACP435 (WW0577)	DIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKr tvaapsvfifppsdeqlksgtasvvcllnnfypreakvqwkvdnalqsgnsqesvteqdskdstyslssttltlskadyekh kvyacevthqglsspvtksfnrgecggggsggggsggggsggggsggggsggggsevqllesggglvqpggslrlsca asgsifsanamgwyrqapgkqrelvavissggstnyadsvkgrftisrdnsknttvylqmnslraedtavyycmysgsy yytpndywgqgtlvtvss**
355	ACP371 (WW0513)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPG

		KAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGcGTKVEIK**
356	ACP372 (WW0514)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPG KcPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIK**
357	ACP373 (WW0515)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGcGTKVEIK**
358	ACP374 (WW0516)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KcPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIK**
359	ACP375 (WW0517)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKcLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKP GKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGcGTKVEIK**
360	ACP376 (WW0521)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGcGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKP GKcPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIK**
361	ACP377 (WW0519)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsevqllesggglvqpggslrlscaasgsi

		fsanamgwyrqapgkqrelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsyyytp ndywgqgtlvtvss**
362	ACP378 (WW0520)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSastkgps vfplapsskstsggtaalgclvkdyfpepvtvswnsgaltsgvhtfpavlqssglyslssvvtvpssslgtqtyicnvnhkp sntkvdkrvepksc**
363	ACP379 (WW0521)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennyklttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSastkgpsvfplapsskstsggtaal gclvkdyfpepvtvswnsgaltsgvhtfpavlqssglyslssvvtvpssslgtqtyicnvnhkpsntkvdkrvepksc**
364	ACP368 (WW0446)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSsggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKVTE KVWGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPE DFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
365	ACP365 (WW0443)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSsggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKARE KLWSAVAWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPE DFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
366	ACP366 (WW0444)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSsggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKARE KLWSAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPE DFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH
367	ACP284	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGSrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAG MKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGS RSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGL QAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGG GVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYY ADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSS
368	ACP285	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtl dqssevlgsgktltiqvkefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktflrceaknysgrftcw wlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsaSpaaeeslpievmvdavhklkyeny tssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrkna sisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesSlatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVES

		GGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNK YYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGT MVTVSS
369	ACP286	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtl dqssevlgsgktltiqvkefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktflrceaknysgrftcw wlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyeny tssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrkna sisvraqdryyssswsewasvpcsggggsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklk hysctaedidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaal qnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGG PGPAGMKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVT ISCSGSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSAS LAITGLQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQ LVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDG SNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWG QGTMVTVSS
370	ACP287	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtl dqssevlgsgktltiqvkefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktflrceaknysgrftcw wlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyeny tssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrkna sisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhyscta edidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnh qqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPA GMKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCS GSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAIT GLQAEDEADYYCQSYDRYTHPALLFGcGTKVTVLggggsggggsggggsQVQLVES GGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKcLEWVAFIRYDGSNKY YADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTM VTVSS
371	ACP288	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtl dqssevlgsgktltiqvkefgdagqytchkggevlshslllhkkedgiwstdilkdqkepknktflrceaknysgrftcw wlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyeny tssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrkna sisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhyscta edidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnh qqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPA GMKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCS GSRSNIGSNTVKWYQQLPGTcPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAIT GLQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVES GGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNK YYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGcGT MVTVSS
372	ACP289 (WW0233)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpgpagmkglpgsevqlvesggglvqpgns lrlscaasgftfskfgmswvrqapgkglewvssisgsgrdtlyaesvkgrftisrdnakttlylqmnslrpedtavyyctig gslsvssqgtlvtvssggggsggggsggggsggggsggggsggggsggggsggpgpagmkglpgsevqlvesggglvqpg gslrlscaasgftfssytlawvrqapgkglewvaaidsssytyspdtvrgrftisrdnaknslylqmnslraedtavyycar dsnwdaldywgqgttvtvssggggsggggsggggsdiqmtqspsslsasvgdrvtitckasqnvgtnvgwyqqkpg kapkaliysasfrysgvpsrfsgsgsgtdftltisslqpedfatyycqqyytypytfggqtkveikhhhhhh
373	ACP290 (WW0234)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpgpagmkglpgsevqlvesggglvqpgns lrlscaasgftfskfgmswvrqapgkglewvssisgsgrdtlyaesvkgrftisrdnakttlylqmnslrpedtavyyctig

		gslsvssqgtlvtvssggggsggggsggggsggggsggggsggggssggpgpagmkglpgQVQLQESGGG LVQTGGSLRLSCTTSGTIFSGYTMGWYRQAPGEQRELVAVISGGGDTNYADS VKGRFTISRDNTKDTMYLQMNSLKPEDTAVYYCYSREVTPPWKLYWGQGTQ VTVSSAAAYPYDVPDYGSHHHHHH
374	ACP291 (WW0235)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpgpagmkglpgsevqlvesggglvqpgns lrlscaasgftfskfgmswvrqapgkglewvssisgsgrdtlyaesvkgrftisrdnakttlylqmnslrpedtavyyctig gslsvssqgtlvtvssggggsggggsggggsggggsggggsggggssggpgpagmkglpgQVQLQESGGG LVQEGGSLRLSCAASERIFSTDVMGWYRQAAEKQRELVAVVSARGTTNYLDA VKGRFTISRDNARNTLTLQMNDLKPEDTASYYCYVRETTSPWRIYWGQGTQV TVSSAAAYPYDVPDYGSHHHHHH
375	ACP292 (WW0236)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpgpagmkglpgsevqlvesggglvqpgns lrlscaasgftfskfgmswvrqapgkglewvssisgsgrdtlyacsvkgrftisrdnakttlylqmnslrpedtavyyctig gslsvssqgtlvtvssggggsggggsggggsggggsggggsggggssggpgpagmkglpgQVQLQESGGG LVQAGGSLRLSCAASGSIFSANAMGWYRQAPGKQRELVAVISSGGSTNYADS VKGRFTISRDNAKNTVYLQMNSLKPEDTAVYYCMYSGSYYYTPNDYWGQGT QVTVSSAAAYPYDVPDYGSHHHHHH
376	ACP296 (WW0250)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLV QPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRG RFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVS SSGGPGPAGMKGLPGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ YYTYPYTFGGGTKVEIKHHHHHHHEPEA**
377	ACP297 (WW0251)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLV QPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRG RFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVS SGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGKAPKLLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ YYTYPYTFGGGTKVEIKHHHHHHHEPEA**
378	ACP298 (WW0252)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLV QPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRG RFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVS SGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGKAPKGLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ YYTYPYTFGGGTKVEIKHHHHHHHEPEA**
379	ACP299 (WW0253)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfSqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLV QPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRG RFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVS SGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ YYTYPYTFGGGTKVEIKHHHHHHHEPEA**

380	ACP300 (WW0255)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSdahksevahrf kdlgeenfkalvliafaqylqqcpfedhvklvnevtefaktcvadesaencdkslhtlfgdklctvatlretygemadcca kqepernecflqhkddnpnlprlvrpevdvmctafhdneetflkkylyeiarrhpyfyapellffakrykaafteccqaa dkaacllpkldelrdegkassakqrlkcaslqkfgerafkawavarlsqrfpkaefacvsklvtdltkvhtecchgdlleca ddradlakyicenqdsisskllkeccekpllekshciaevendempadlpslaadfveskdvcknyaeakdvflgmfly eyarrhpdysvvllrlaktyettlekccaaadphecyakvfdefkplveepqnlikqncelfeqlgeykfqnallvrytkk vpqvstptlvevsrnlgkvgskcckhpeakrmpcaedylsvvlnqlcvlhektpvsdrvtkcctesivnrrpcfsalevd etyvpkefnaetftfhadictlsekerqikkqtalvelvkhkpkatkeqlkavmddfaafvekcckaddketcfaeegkk lvaasqaalglggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGG GLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDT VRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTV TVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVG WYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQYYTYPYTFGGGTKVEIKHHHHHHHEPEA**
381	ACP302 (WW0296)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEAHKSEIA HRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESAA NCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSLP PFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEILT QCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAVA RLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKYMCENQA TISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEA KDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTVL AEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAA RNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGS LVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVK HKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALAgg ggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPG KAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGGGTKVEIKHHHHHHH**
382	ACP303	EAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKT CVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQH KDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYA EQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERA FKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAK YMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQE VCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANP PACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQV STPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSE HVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKK QTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVT RCKDALASGGPGPAGMKGLPGStkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlis ninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllldlqmilnginnyknpkltrm lSGGPGPAGMKGLPGSEAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYD EHAKLVQEVTDFAKTCVADESAANCDKSLHTLFGDKLCAIPNLRENYGELAD CCTKQEPERNECFLQHKDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEV ARRHPYFYAPELLYYAEQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVR QRMKCSSMQKFGERAFKAWAVARLSQTFPNADFAEITKLATDLTKVNKECC HGDLLECADDRAELAKYMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTM PADLPAIAADFVEDQEVCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAK KYEATLEKCCAEANPPACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGF QNAILVRYTQKAPQVSTPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAI LNRVCLLHEKTPVSEHVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFH

		SDICTLPEKEKQIKKQTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAA DKDTCFSTEGPNLVTRCKDALAHHHHHH**
383	ACP304 (WW0302)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLV QPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRG RFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVS SGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ YYTYPYTFGGGTKVEIKSGGPGPAGMKGLPGSggggsggggsggggsggggsggggsggg gselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqp eeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmth gktrwtqpqlictgemetsqfpgeekpqaspegrpesetsclvtttdfqiqtemaatmetsiftteyqHHHHHH**
384	ACP305 (WW0303)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsclvtttdfqiqtemaatmetsiftteyqggggsggggsgggg sggggsggggsggggsSGGPGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltf kfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfc qsiistltSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFG MSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNS LRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsSG GPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQ APGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAV YYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSL SASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSG SGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH**
385	ACP306 (WW0304)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSggggsgggggsggggsggggsggggsggggsclcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsclvtttdfqiqtemaatmetsiftteyqSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH**
386	ACP307	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGStfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqlehlllldlqmilnginnyknpkl trmlSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMS WVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLR PEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggsSGGP GPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAP GKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVY YCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLS ASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGS GSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH**
387	ACP308	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCK ASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSL QPEDFATYYCQQYYTYPYTFGGGTKVEIKSGGPGPAGMKGLPGSggggsggggsg

		gggsggggsggggsggggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSSGGPGPAGMKGLPGStfkfympkkatelkhlqcleee lkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltGGssstkktqlqle hllldlqmilnginnyknpkltrmlSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLS CAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDN AKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHHH**
388	ACP309 (WW0307)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLV QPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRG RFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVS SGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGKAPKSLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQY YTYPYTFGGGTKVEIKHHHHHH**
389	ACP310 (WW0308)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSSggggsggggsggggsggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLV QPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRG RFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVS SGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWY QQKPGQAPRLLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQY YTYPYTFGGGTKVEIKHHHHHH**
390	ACP311 (WW0316)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSeskygppcpp cpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpreeqfnstyrvvsvl tvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfypsdiavewesn gqpennyklttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgkggggsggggsgggg ggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASG FTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLY LQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGG GGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYS ASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKV EIKHHHHHHH**
391	ACP312 (WW0317)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennyklttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgkSGG PGPAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeel kpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsgggg sggggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASG FTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLY LQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGG GGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYS ASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKV EIKHHHHHHH**
392	ACP313 (WW0318)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltSGGPGPAGMKGLPGSggggsggggs ggggsggggsggggsggggsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVR QAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTA VYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFS GSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKSGGPGPAGM KGLPGSeskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevh naktkpreeqfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqv

		sltclvkgfypsdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslsl slgkHHHHHHH**
393	ACP314 (WW0354)	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenykntqpimdtdgsyfvyskInvqksnweagntftcsvlheglhnhhtekslshspgkSGGPG PAGMKGLPGSaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkple evlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggsSGGPGPAGMKGLPGSEVQLVESGGGLVQPGGSLRLSCAASGFT FSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQ MNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGG SDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSAS FRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEI KHHHHHH**
394	ACP336 (WW0414)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSsggpG PAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKA PKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTF GGGTKVEIK**
395	ACP337 (WW0415)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPG KAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPY TFGGGTKVEIK**
396	ACP338 (WW0416)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSsggpG PAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGK APISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTF GGGTKVEIK**
397	ACP339 (WW0417)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGS LRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISR DNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGG SGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKP

		GKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYP YTFGGGTKVEIK**
398	ACP340 (WW0418)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsevqllesggglvqpggslrlscaasgsi fsanamgwyrqapgkglelvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsyyytp ndywgqgtlvtvss**
399	ACP341 (WW0419)	aptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrpr dlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltsggpGPAGLYAQpgsEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsevqllesggglvqpggslrlscaasgcri fstdvmgwyrqapgkqrelvavvsargttnyldavkgrftisrdnskntlylqmnslraedtavyycyvrettspwriy wgqgtlvtvss**
400	ACP342 (WW0420)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyqggggsggggsgggg sggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfy mpkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsii stltsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGQGTTVTVSSggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVT ITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLT ISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
401	ACP343 (WW0421)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyqggggsggggsgggg sggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfy mpkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsii stltsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGD RVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
402	ACP344 (WW0422)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyqggggsggggsgggg sggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfy mpkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsii stltsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGQGTTVTVSSggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVT ITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLT ISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
403	ACP345 (WW0423)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyqggggsggggsgggg

		sggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfy mpkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsii stltsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLE WVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARD SNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGD RVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
404	ACP346 (WW0424)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyqggggsggggsgggg sggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfy mpkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsii stltsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsevqllesggglvqpggslrlscaasgsifsanamgwyrqapgkglelvavissggstnyadsvkgrftisr dnskntvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvss**
405	ACP347 (WW0425)	elcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqctssatrnttkqvtpqpee qkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralhrgpaesvckmthgk trwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyqggggsggggsgggg sggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfy mpkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsii stltsggpGPAGLYAQpgsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWV RQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPED TAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsggggsggggsggggsggggssggpGPAG LYAQpgsevqllesggglvqpggslrlscaaserifstdvmgwyrqapgkqrelvavvsargttnyldavkgrftisrd nskntlylqmnslraedtavyycyvrettspwriywgqgtlvtvss**
406	ACP348 (WW0426)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsgggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSggpGPAGLYAQpgsDIQ MTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASFRYS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
407	ACP349 (WW0427)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsgggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKAREKLWSAVAWYQQKPGKAPKsLIYSASF RYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK **
408	ACP350 (WW0428)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlllldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsgggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM

		NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSsggpGPAGLYAQpgsDIQ MTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSLRKS GVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK**
409	ACP351 (WW0429)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsEVQLVESGGGLVQPGGSLRLSCAASGFTFS SYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQM NSLRAEDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKVTEKVWGNVAWYQQKPGKAPISLIYSPSL RKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIK **
410	ACP352 (WW0430)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsevqllesgglvqpggslrlscaasgsifsanamgwyrqapgkgl elvavissggstnyadsvkgrftisrdnskntvylqmnslraedtavyycmysgsyyytpndywgqgtlvtvss**
411	ACP353 (WW0431)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgsaptssstkktqlqlehlldlqmilnginnyknpkltrmltfkfympkkatelkhlqcleeelkpl eevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadetativeflnrwitfcqsiistltggggsggggsggggsgg ggsggggsggggssggpGPAGLYAQpgsevqllesgglvqpggslrlscaaserifstdvmgwyrqapgkqr elvavvsargttnyldavkgrftisrdnskntlylqmnslraedtavyycyvrettspwriywgqgtlvtvss**
412	ACP354 (WW0432)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqcts satrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralh rgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsifteyq ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKAREKLWSA VAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATY YCQQYYTYPYTFGGGTKVEIK**
413	ACP355 (WW0433)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqcts satrnttkqvtpqpeeqkerkttemqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralh rgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsifteyq ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLW SAVAWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQYYTYPYTFGGGTKVEIK**
414	ACP356	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy

	(WW0434)	psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqcts satrnttkqvtpqpeeqkerktternqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralh rgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyq ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSsggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKVTEKVWGN VAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFATYY CQQYYTYPYTFGGGTKVEIK**
415	ACP357 (WW0435)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqcts satrnttkqvtpqpeeqkerktternqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralh rgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyq ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKV WGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDF ATYYCQQYYTYPYTFGGGTKVEIK**
416	ACP358 (WW0436)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqcts satrnttkqvtpqpeeqkerktternqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralh rgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyq ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsevqllesg gglvqpggslrlscaasgsifsanamgwyrqapgkglelvavissggstnyadsvkgrftisrdnskntvylqmnslrae dtavyycmysgsyyytpndywgqgtlvtvss**
417	ACP359 (WW0437)	eskygppcppcpapeflggpsvflfppkpkdtlmisrtpevtcvvvdvsqedpevqfnwyvdgvevhnaktkpree qfnstyrvvsvltvlhqdwlngkeykckvsnkglpssiektiskakgqprepqvytlppsqeemtknqvsltclvkgfy psdiavewesngqpennykttppvldsdgsfflysrltvdksrwqegnvfscsvmhealhnhytqkslslslgksggp GPAGLYAQpgselcdddppeiphatfkamaykegtmlnceckrgfrriksgslymlctgnsshsswdnqcqcts satrnttkqvtpqpeeqkerktternqspmqpvdqaslpghcrepppweneateriyhfvvgqmvyyqcvqgyralh rgpaesvckmthgktrwtqpqlictgemetsqfpgeekpqaspegrpesetsSlvtttdfqiqtemaatmetsiftteyq ggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsaptssstkktqlqlehlllldlqmilngin nyknpkltrmltfkfympkkatelkhlqcleeelkpleevlnlaqsknfhlrprdlisninvivlelkgsettfmceyadet ativeflnrwitfcqsiistltggggsggggsggggsggggsggggsggggssggpGPAGLYAQpgsevqllesg gglvqpggslrlscaaserifstdvmgwyrqapgkqrelvavvsargttnyldavkgrftisrdnskntlylqmnslraed tavyycyvrettspwriywgqgtlvtvss**
418	ACP360 (WW0438)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSggggsggggsggggsDIQMTQSPSSLSASVGDRVTITCKASQNV GTNVGWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDF ATYYCQQYYTYPYTFGGGTKVEIKHHHHHH**
419	ACP361 (WW0439)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSsggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKASQ NVGTNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPE DFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH**

420	ACP362 (WW0440)	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSsggpGPAGLYAQpgsDIQMTQSPSSLSASVGDRVTITCKASQ NVGTNVGWYQQKPGKAPKsLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPE DFATYYCQQYYTYPYTFGGGTKVEIKHHHHHH**
421	ACP200	lveepknlvktncdlyeklgeygfqnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcl lhektpvsehvtkccsgslverrpcfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkpkataeqlk tvmddfaqfldtcckaadkdtcfstegpnlvtrckdalaSGGPGPAGMKGLPGScdlpqthnlrnkraltllvq mrrlsplsclkdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmq qvgvqefpltqedallavrkyfhritvylrekkhspcawevvraevwralsssanvlgrlreekSGGPGPAGMK GLPGSlveepknlvktncdlyeklgeygfqnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedyl sailnrvcllhektpvsehvtkccsgslverrpcfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkp kataeqlktvmddfaqfldtcckaadkdtcfstegpnlvtrckdalaHHHHHH**
422	ACP201	eahkseiahryndlgeqhfkglvliafsqylqkcsydehaklvqevtdfaktcvadesaancdkslhtlfgdklcaipnlr enygeladcctkqepernecflqhkddnpslppferpeaeamctsfkenpttfmghylhevarrhpyfyapellyyaeq yneiltqccaeadkescltpkldgvkekalvssvrqGGGGSGGGGSGGSlveepknlvktncdlyeklgeygf qnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcllhektpvsehvtkccsgslverrp cfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkpkataeqlktvmddfaqfldtcckaadkdtcf stegpnlvtrckdalaSGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekv daqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfh ritvylrekkhspcawevvraevwralsssanvlgrlreekSGGPGPAGMKGLPGSeahkseiahryndlge qhfkglvliafsqylqkcsydehaklvqevtdfaktcvadesaancdkslhtlfgdklcaipnlrenygeladcctkqepe rnecflqhkddnpslppferpeaeamctsfkenpttfmghylhevarrhpyfyapellyyaeqyneiltqccaeadkes cltpkldgvkekalvssvrqGGGGSGGGGSGGSlveepknlvktncdlyeklgeygfqnailvrytqkapqvs tptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcllhektpvsehvtkccsgslverrpcfsaltvdetyvpkefk aetftfhsdictlpekekqikkqtalaelvkhkpkataeqlktvmddfaqfldtcckaadkdtcfstegpnlvtrckdalaH HHHHH**
423	ACP202	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSggggsgggSGGPGPAGMKGLPGSggggsgggscdlpqthnlrnkraltllvqmrrls plsclkdrkdfgfpqekvdaqqikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgv qefpltqedallavrkyfhritvylrekkhspcawevvraevwralsssanvlgrlreekggggsgggSGGPGPAG MKGLPGSggggsgggsEVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVR QAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDT AVYYCTIGGSLSVSSQGTLVTVSSHHHHHH**
424	ACP203	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgscdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvdaq qikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhritv ylrekkhspcawevvraevwralsssanvlgrlreeksggpGPAGLYAQpgsEVQLVESGGGLVQP GNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
425	ACP204	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgscdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvdaqqi kkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhritvyl rekkhspcawevvraevwralsssanvlgrlreeksggpALFKSSFPpgsEVQLVESGGGLVQPGNS LRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTI SRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
426	ACP205	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpPLAQKLKSSpgscdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvdaq qikkaqaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhritv ylrekkhspcawevvraevwralsssanvlgrlreeksggpPLAQKLKSSpgsEVQLVESGGGLVQP GNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
427	ACP206	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS

		SQGTLVTVSSsggpGPAGLYAQpgscdlpqthslgsrrtlmllaqmrrislfsclkdrhdfgfpqeefgnqf qkaetipvlhemiqqifnlfstkdssaawdetlldkfytelyqqlndleacviqgvgvtetplmkedsilavrkyfqritlyl kekkyspcawevvraeimrsfslstnlqeslrskesggpGPAGLYAQpgsEVQLVESGGGLVQPGN SLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFT ISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
428	ACP207	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgscdlpqthslgsrrtlmllaqmrrislfsclkdrhdfgfpqeefgnqfq kaetipvlhemiqqifnlfstkdssaawdetlldkfytelyqqlndleacviqgvgvtetplmkedsilavrkyfqritlylk ekkyspcawevvraeimrsfslstnlqeslrskesggpALFKSSFPpgsEVQLVESGGGLVQPGNSL RLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTIS RDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
429	ACP208	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpPLAQKLKSSpgscdlpqthslgsrrtlmllaqmrrislfsclkdrhdfgfpqeefgnqf qkaetipvlhemiqqifnlfstkdssaawdetlldkfytelyqqlndleacviqgvgvtetplmkedsilavrkyfqritlyl kekkyspcawevvraeimrsfslstnlqeslrskesggpPLAQKLKSSpgsEVQLVESGGGLVQPG NSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRF TISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS**
430	ACP211	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdm kilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslr krkrsrcSGGPGPAGMKGLPGScdlpqthnlrnkraltllvqmrrlsplsclkdrkdfgfpqekvdaqqikka qaipvlseltqqilniftskdssaawnttlldsfcndlhqqlndlqgclmqqvgvqefpltqedallavrkyfhritvylrek khspcawevvraevwralsssanvlgrlreekSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveek slfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqr qafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSEVQLVESGGGLVQPGNSLRLS CAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISRDN AKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH
431	ACP213	lveepknlvktncdlyeklgeygfqnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcl lhektpvsehvtkccsgslverrpcfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkpkataeqlk tvmddfaqfldtcckaadkdtcfstegpnlvtrckdalaSGGPGPAGMKGLPGShgtviesleslnnyfnssgi dveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnn pqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSlveepknlvktncdlyeklgeygfqn ailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcllhektpvsehvtkccsgslverrpcfs altvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkpkataeqlktvmddfaqfldtcckaadkdtcfste gpnlvtrckdalaSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdmkil qsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslrkr krsrcSGGPGPAGMKGLPGSlveepknlvktncdlyeklgeygfqnailvrytqkapqvstptlveaarnlgr vgtkcctlpedqrlpcvedylsailnrvcllhektpvsehvtkccsgslverrpcfsaltvdetyvpkefkaetftfhsdictl pekekqikkqtalaelvkhkpkataeqlktvmddfaqfldtcckaadkdtcfstegpnlvtrckdalaHHHHHH**
432	ACP214	eahkseiahryndlgeqhfkglvliafsqylqkcsydehaklvqevtdfaktcvadesaancdkslhtlfgdklcaipnlr enygeladcctkqepernecflqhkddnpslppferpeaeamctsfkenpttfmghylhevarrhpyfyapellyyaeq yneiltqccaeadkescltpkldgvkekalvssvrqGGGGSGGGGSGGSlveepknlvktncdlyeklgeygf qnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsailnrvcllhektpvsehvtkccsgslverrp cfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkpkataeqlktvmddfaqfldtcckaadkdtcf stegpnlvtrckdalaSGGPGPAGMKGLPGShgtviesleslnnyfnssgidveekslfldiwrnwqkdgdm kilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhqllpesslr krkrsrcSGGPGPAGMKGLPGSeahkseiahryndlgeqhfkglvliafsqylqkcsydehaklvqevtdfa ktcvadesaancdkslhtlfgdklcaipnlrenygeladcctkqepernecflqhkddnpslppferpeaeamctsfken pttfmghylhevarrhpyfyapellyyaeqyneiltqccaeadkescltpkldgvkekalvssvrqGGGGSGGGG SGGSlveepknlvktncdlyeklgeygfqnailvrytqkapqvstptlveaarnlgrvgtkcctlpedqrlpcvedylsa

		ilnrvcllhektpvsehvtkccsgslverrpcfsaltvdetyvpkefkaetftfhsdictlpekekqikkqtalaelvkhkpk ataeqlktvmddfaqfldtcckaadkdtcfstegpnlvtrckdalaSGGPGPAGMKGLPGShgtviesleslnn yfnssgidveekslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsia kfevnnpqvqrqafnelirvvhqllpesslrkrkrsrcSGGPGPAGMKGLPGSeahkseiahryndlgeqhfk glvliafsqylqkcsydehaklvqevtdfaktcvadesaancdkslhtlfgdklcaipnlrenygeladcctkqepernec flqhkddnpslppferpeaeamctsfkenpttfmghylhevarrhpyfyapellyyaeqyneiltqccaeadkescltpk ldgvkekalvssvrqGGGGSGGGGSGGSlveepknlvktncdlyeklgeygfqnailvrytqkapqvstptlv eaarnlgrvgtkcctlpedqrlpcvedylsailnrvcllhektpvsehvtkccsgslverrpcfsaltvdetyvpkefkaetft fhsdictlpekekqikkqtalaelvkhkpkataeqlktvmddfaqfldtcckaadkdtcfstegpnlvtrckdalaHHH HHH**
433	ACP215	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSggggsgggSGGPGPAGMKGLPGSggggsgggshgtviesleslnnyfnssgidveee kslfldiwrnwqkdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvq rqafnelirvvhqllpesslrkrkrsrcggggsgggSGGPGPAGMKGLPGSggggsgggsEVQLVESG GGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLY AESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTV SSggggsgggSGGPGPAGMKGLPGSggggsgggshgtviesleslnnyfnssgidveekslfldiwrnwq kdgdmkilqsqiisfylrlfevlkdnqaisnnisvieshlittffsnskakkdafmsiakfevnnpqvqrqafnelirvvhq llpesslrkrkrsrcggggsgggSGGPGPAGMKGLPGSggggsgggsEVQLVESGGGLVQPGN SLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFT ISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHHHH* *
434	ACP240	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSggggsggggsggggsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevl gsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistd ltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdi ikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqd ryyssswscwasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktarcklkhysctacdidhedi trdqtstlktclplelhknesclatretssttrgsclppqktslnmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkg mlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaggggsggggsggggsg gggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNT VKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEAD YYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGR SLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGR FTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSHHH HHH
435	ACP241	EAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKT CVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQH KDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYA EQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERA FKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAK YMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQE VCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANP PACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQV STPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSE HVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKK QTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVT RCKDALASGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt

		istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAG MKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGS RSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGL QAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGG GVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYY ADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSSHHHHHH**
436	ACP242	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSggggsggggsggggsggggsggg gsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLI YYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLF GTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYG MHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMN SLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSSGGPGPAGMKGLPGSEAHKS EIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADE SAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNP SLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNE ILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWA VARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKYMCEN QATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNY AEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYG TVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLV EAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCC SGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAEL VKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDAL AHHHHHH**
437	ACP243	vprdcgckpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstf rsvselpimhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditv ewqwngqpaenyknqpimdtdgsyfvyslnvqksnweagntftcsvlheglhnhhtekslshspgkSGGPG PAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgda gqytchkggevlshslllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqg vtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplk nsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvp csggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelh knesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnh ngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSggggsgggg sggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQ QLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQS YDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLS CAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRD NSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSHHHHHH**
438	ACP244	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssaSGGPGPAGMKGLPGSggggsggggsggggsggggsggg gsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPGTAPKLLI YYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYTHPALLF

		GTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGFTFSSYG MHWVRQAPGKGLEWVAFIRYDGSNKYYADSVKGRFTISRDNSKNTLYLQMN SLRAEDTAVYYCKTHGSHDNWGQGTMVTVSSSGGPGPAGMKGLPGSvprdcgc kpcictvpevssvfifppkpkdvltitltpkvtcvvvdiskddpevqfswfvddvevhtaqtqpreeqfnstfrsvselpi mhqdwlngkefkcrvnsaafpapiektisktkgrpkapqvytipppkeqmakdkvsltcmitdffpeditvewqwn gqpaenykntqpimdtdgsyfvyskInvqksnweagntftcsvlheglhnhhteksIshspgkHHHHHH**
439	ACP245	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtl dqssevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcw wlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyeny tssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrkna sisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhyscta edidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnh qqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPA GMKGLPGSggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCS GSRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAIT GLQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLSGGPGPAGMKGLPGSQV QLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYD GSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNW GQGTMVTVSSHHHHHH
440	ACP247	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGMKGLPGSiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtl dqssevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcw wlttistdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyeny tssffirdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrkna sisvraqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhyscta edidheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnh qqiildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssaSGGPGPA GMKGLPGSggggsggggsggggsggggsggggsggggsQVQLQESGGGLVQAGGSLRLSC AASGRTFSSVYDMGWFRQAPGKDREFVARITESARNTRYADSVRGRFTISRDN AKNTVYLQMNNLELEDAAVYYCAADPQTVVVGTPDYWGQGTQVTVSSHHH HHH
636	WW0301	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPGPAGMKGLPGSEVQLVESGGGLVQ PGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSGGGGS GGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSEVQLVESGGGL VQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVR GRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTV SSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVGW YQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQ QYYTYPYTFGGGTKVEIKHHHHHH
637	WW0353	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPGPAGMKGLPGSVPRDCGCKPCICTV PEVSSVFIFPPKPKDVLTITLTPKVTCVVVDISKDDPEVQFSWFVDDVEVHTAQ TQPREEQFNSTFRSVSELPIMHQDWLNGKEFKCRVNSAAFPAPIEKTISKTKGR PKAPQVYTIPPPKEQMAKDKVSLTCMITDFFPEDITVEWQWNGQPAENYKNT QPIMDTDGSYFVYSKLNVQKSNWEAGNTFTCSVLHEGLHNHHTEKSLSHSPG KGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSSGGPGPAGMKGLPGSEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVG TNVGWYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCQQYYTYPYTFGGGTKVEIKHHHHHH

638	WW0355	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPGPAGMKGLPGSGGGGSGGGGSGGG GSGGGGSGGGGSGGGGSEVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLA WVRQAPGKGLEWVAAIDSSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRA EDTAVYYCARDSNWDALDYWGQGTTVTVSSGGGGSGGGGSGGGGSDIQMT QSPSSLSASVGDRVTITCKASQNVGTNVGWYQQKPGKAPKALIYSASFRYSGV PSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYTYPYTFGGGTKVEIKSGGPG PAGMKGLPGSVPRDCGCKPCICTVPEVSSVFIFPPKPKDVLTITLTPKVTCVVV DISKDDPEVQFSWFVDDVEVHTAQTQPREEQFNSTFRSVSELPIMHQDWLNGK EFKCRVNSAAFPAPIEKTISKTKGRPKAPQVYTIPPPKEQMAKDKVSLTCMITD FFPEDITVEWQWNGQPAENYKNTQPIMDTDGSYFVYSKLNVQKSNWEAGNT FTCSVLHEGLHNHHTEKSLSHSPGKHHHHHH
639	WW0365	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTGGGSGGGSGGGSGGGSEVQLVESGGGLV QPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVK GRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSGGG GSGGGGSGGGGSGGGGSGGGGSGGGGSSGGPGPAGMKGLPGSEVQLVESGG GLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDT VRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTV TVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASQNVGTNVG WYQQKPGKAPKALIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQYYTYPYTFGGGTKVEIKHHHHHHHHEPEA
640	WW0366	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPGPAGMKGLPGSEVQLVESGGGLVQ PGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHH HHEPEA
641	WW0472	VPRDCGCKPCICTVPEVSSVFIFPPKPKDVLTITLTPKVTCVVVDISKDDPEVQF SWFVDDVEVHTAQTQPREEQFNSTFRSVSELPIMHQDWLNGKEFKCRVNSAA FPAPIEKTISKTKGRPKAPQVYTIPPPKEQMAKDKVSLTCMITDFFPEDITVEWQ WNGQPAENYKNTQPIMDTDGSYFVYSKLNVQKSNWEAGNTFTCSVLHEGLH NHHTEKSLSHSPGKSGGPGPAGLYAQPGSAPTSSSTKKTQLQLEHLLLDLQMI LNGINNYKNPKLTRMLTFKFYMPKKATELKHLQCLEEELKPLEEVLNLAQSK NFHLRPRDLISNINVIVLELKGSETTFMCEYADETATIVEFLNRWITFCQSIISTL TGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSSGGPGPAGLYAQPGSEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSSGGGPGPAGLYAQPGSDIQMTQSPSSLSASVGDRVTITCKAREKLW SAVAWYQQKPGKAPKSLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCQQYYTYPYTFGGGTKVEIK
642	WW0473	VPRDCGCKPCICTVPEVSSVFIFPPKPKDVLTITLTPKVTCVVVDISKDDPEVQF SWFVDDVEVHTAQTQPREEQFNSTFRSVSELPIMHQDWLNGKEFKCRVNSAA FPAPIEKTISKTKGRPKAPQVYTIPPPKEQMAKDKVSLTCMITDFFPEDITVEWQ WNGQPAENYKNTQPIMDTDGSYFVYSKLNVQKSNWEAGNTFTCSVLHEGLH NHHTEKSLSHSPGKSGGPGPAGLYAQPGSAPTSSSTKKTQLQLEHLLLDLQMI LNGINNYKNPKLTRMLTFKFYMPKKATELKHLQCLEEELKPLEEVLNLAQSK NFHLRPRDLISNINVIVLELKGSETTFMCEYADETATIVEFLNRWITFCQSIISTL TGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSSGGPGPAGLYAQPGSEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKAREKLW SAVAWYQQKPGKAPKSLIYSASFRYSGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCQQYYTYPYTFGGGTKVEIK
643	WW0474	VPRDCGCKPCICTVPEVSSVFIFPPKPKDVLTITLTPKVTCVVVDISKDDPEVQF SWFVDDVEVHTAQTQPREEQFNSTFRSVSELPIMHQDWLNGKEFKCRVNSAA

		FPAPIEKTISKTKGRPKAPQVYTIPPPKEQMAKDKVSLTCMITDFFPEDITVEWQ WNGQPAENYKNTQPIMDTDGSYFVYSKLNVQKSNWEAGNTFTCSVLHEGLH NHHTEKSLSHSPGKSGGPGPAGLYAQPGSAPTSSSTKKTQLQLEHLLLDLQMI LNGINNYKNPKLTRMLTFKFYMPKKATELKHLQCLEEELKPLEEVLNLAQSK NFHLRPRDLISNINVIVLELKGSETTFMCEYADETATIVEFLNRWITFCQSIISTL TGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSSGGPGPAGLYAQPGSEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSSGGPGPAGLYAQPGSDIQMTQSPSSLSASVGDRVTITCKVTEKVW GNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQYYTYPYTFGGGTKVEIK
644	WW0475	VPRDCGCKPCICTVPEVSSVFIFPPKPKDVLTITLTPKVTCVVVDISKDDPEVQF SWFVDDVEVHTAQTQPREEQFNSTFRSVSELPIMHQDWLNGKEFKCRVNSAA FPAPIEKTISKTKGRPKAPQVYTIPPPKEQMAKDKVSLTCMITDFFPEDITVEWQ WNGQPAENYKNTQPIMDTDGSYFVYSKLNVQKSNWEAGNTFTCSVLHEGLH NHHTEKSLSHSPGKSGGPGPAGLYAQPGSAPTSSSTKKTQLQLEHLLLDLQMI LNGINNYKNPKLTRMLTFKFYMPKKATELKHLQCLEEELKPLEEVLNLAQSK NFHLRPRDLISNINVIVLELKGSETTFMCEYADETATIVEFLNRWITFCQSIISTL TGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSSGGPGPAGLYAQPGSEVQLV ESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTY SPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQ GTTVTVSSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKVTEKV WGNVAWYQQKPGKAPISLIYSPSLRKSGVPSRFSGSGSGTDFTLTISSLQPEDF ATYYCQQYYTYPYTFGGGTKVEIK
645	WW0476	VPRDCGCKPCICTVPEVSSVFIFPPKPKDVLTITLTPKVTCVVVDISKDDPEVQF SWFVDDVEVHTAQTQPREEQFNSTFRSVSELPIMHQDWLNGKEFKCRVNSAA FPAPIEKTISKTKGRPKAPQVYTIPPPKEQMAKDKVSLTCMITDFFPEDITVEWQ WNGQPAENYKNTQPIMDTDGSYFVYSKLNVQKSNWEAGNTFTCSVLHEGLH NHHTEKSLSHSPGKSGGPGPAGLYAQPGSAPTSSSTKKTQLQLEHLLLDLQMI LNGINNYKNPKLTRMLTFKFYMPKKATELKHLQCLEEELKPLEEVLNLAQSK NFHLRPRDLISNINVIVLELKGSETTFMCEYADETATIVEFLNRWITFCQSIISTL TGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSSGGPGPAGLYAQPGSEVQLL ESGGGLVQPGGSLRLSCAASGSIFSANAMGWYRQAPGKGLELVAVISSGGSTN YADSVKGRFTISRDNSKNTVYLQMNSLRAEDTAVYYCMYSGSYYYTPNDYW GQGTLVTVSS
646	WW0477	VPRDCGCKPCICTVPEVSSVFIFPPKPKDVLTITLTPKVTCVVVDISKDDPEVQF SWFVDDVEVHTAQTQPREEQFNSTFRSVSELPIMHQDWLNGKEFKCRVNSAA FPAPIEKTISKTKGRPKAPQVYTIPPPKEQMAKDKVSLTCMITDFFPEDITVEWQ WNGQPAENYKNTQPIMDTDGSYFVYSKLNVQKSNWEAGNTFTCSVLHEGLH NHHTEKSLSHSPGKSGGPGPAGLYAQPGSAPTSSSTKKTQLQLEHLLLDLQMI LNGINNYKNPKLTRMLTFKFYMPKKATELKHLQCLEEELKPLEEVLNLAQSK NFHLRPRDLISNINVIVLELKGSETTFMCEYADETATIVEFLNRWITFCQSIISTL TGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSSGGPGPAGLYAQPGSEVQLL ESGGGLVQPGGSLRLSCAASERIFSTDVMGWYRQAPGKQRELVAVVSARGTT NYLDAVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCYVRETTSPWRIYWG QGTLVTVSS
647	WW0649 Monomeric IL-12 (chimeric) polypeptide, anti-HSA sdAb, scFv Blocker, 2 cleavage sites	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADS

		VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
454	WW0650	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKY YADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTM VTVSS**
455	WW0651	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktarekIkhysctaedid heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
456	WW0652	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQ AEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGG VVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYA DSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVT VSS**
457	WW0662	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktarekIkhysctaedi dheditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV

		QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
458	WW0663	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYY AeSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSS**
459	WW0664	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
460	WW0665	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYY AeSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSS**
461	WW0666	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGdNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE

		DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
462	WW0667	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGdNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYY AeSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSS**
463	WW0668	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
464	WW0669	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKY YADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTM VTVSS**
465	WW0670	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN

		IGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
466	WW0671	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnaklm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYY AeSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSS**
467	WW0672	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSeSN IGSNdVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
468	WW0673	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnaklm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SeSNIGSNdVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKY YADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTM VTVSS**
469	WW0674	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY

		AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGeNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
470	WW0675	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGeNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYY AeSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSS**
471	WW0676	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktarekIkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasgggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGeeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
472	WW0677	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGeeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGL QAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGG GVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYY ADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSS**
473	WW0678	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktarekIkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi

		ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYADSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
474	WW0679	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESG GGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYY ADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMV TVSS**
475	WW0680	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
476	WW0681	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQ AEDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGG VVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAe SVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTV SS**
477	WW0682	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid

		heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsgggsgggsgggsgggsgggsgggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
635	WW0683	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGV VQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
478	WW0684	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GdNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
479	WW0685	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGdNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGV VQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
480	WW0686	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr

		aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GdcTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAED EADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQ PGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
481	WW0687	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGV VQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYAD SVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTV SS**
482	WW0688	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAED EADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQ PGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVK GRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
483	WW0689	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGV VQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
484	WW0690	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr

		aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSeSNIG SNdVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAED EADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQ PGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
485	WW0691	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSeS NIGSNdVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGV VQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYAD SVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTV SS**
486	WW0692	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GeNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
487	WW0693	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGeNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGV VQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
488	WW0694	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff

		irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GeeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAED EADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQ PGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYADSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
489	WW0695	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGeeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGV VQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYDGSNKYYAD SVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTV SS**
490	WW0696	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVV QPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYADSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS **
491	WW0697	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGV VQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYADS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVS S**
492	WW0698	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt

		istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
493	WW0699	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnaklm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvcli sdfypgavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
494	WW0700	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
495	WW0701	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnaklm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvcli sdfypgavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
496	WW0702	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGdNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE

		DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
497	WW0703	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGdNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvcli sdfypgavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
498	WW0704	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
499	WW0705	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvcli sdfypgavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
500	WW0706	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSeSN IGSNdVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE

		DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
501	WW0707	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SeSNIGSNdVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvcli sdfypgavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
502	WW0708	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGeNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
503	WW0709	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGeNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITG LQAEDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvcli sdfypgavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
504	WW0710	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdlttfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedi dheditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqi ildkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLY AQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSN IGeeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
505	WW0711	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpGPAGLYAQpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqs

		sevlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltt istdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssf firdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisv raqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypc tseeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpGPA GLYAQpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSG SRSNIGeeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGL QAEDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclis dfypgavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
506	WW0712	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
507	WW0713	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGSNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQ AEDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdf ypgavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
508	WW0714	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
509	WW0715	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS

		NIGSeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfyp gavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
510	WW0716	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GdNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
511	WW0717	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfinmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGdNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfyp gavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
512	WW0718	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAED EADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypga vtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**

513	WW0719	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGdeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfyp gavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
514	WW0720	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkpllknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplellhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSeSNIG SNdVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAED EADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypga vtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
515	WW0721	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff

		irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqmmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSeS NIGSNdVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfyp gavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
516	WW0722	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GeNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAE DEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypg avtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
517	WW0723	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqmmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGeNTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfyp gavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
518	WW0724	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshsllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff

		irdiikpdppknlqlkplknsrqvevsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedid heditrdqtstlktclplelhknesclatretssttrgsclppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiil dkgmlvaidelmqslnhngetlrqkppvgeadpyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSF PpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNI GeeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAED EADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypga vtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
519	WW0725	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSsggpALFKSSFPpgsiwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqss evlgsgktltiqvkefgdagqytchkggevlshslllllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwltti stdltfsvkssrgssdpqgvtcgaatlsaervrgdnkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssff irdiikpdppknlqlkplknsrqvcvsweypdtwstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvr aqdryyssswsewasvpcsggggsggggsggggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypct seeidheditkdktstveaclpleltknesclnsretsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllm dpkrqifldqnmlavidelmqalnfnsetvpqkssleepdfyktkiklcillhafriravtidrvmsylnassggpALFK SSFPpgsggggsggggsggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRS NIGeeTVKWYQQLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQA EDEADYYCQSYDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfyp gavtvawkadsspvkagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
520	WW0726	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIR YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHD NWGQGTMVTVSSastkgpsvfplapsskstsggtaalgclvkdyfpepvtvswnsgaltsgvhtfpavlqssgl yslssvvtvpssslgtqtyicnvnhkpsntkvdkrvepksc**
521	WW0727	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIR YeGSNKYYAeSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDN WGQGTMVTVSSastkgpsvfplapsskstsggtaalgclvkdyfpepvtvswnsgaltsgvhtfpavlqssgly slssvvtvpssslgtqtyicnvnhkpsntkvdkrvepksc**
522	WW0728	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAFIR YeGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCKTHGSHDN WGQGTMVTVSSastkgpsvfplapsskstsggtaalgclvkdyfpepvtvswnsgaltsgvhtfpavlqssgly slssvvtvpssslgtqtyicnvnhkpsntkvdkrvepksc**

523	WW0765	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryysssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLYAQpgsEVQLVESGGGLVQPGNSL RLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTIS RDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgg ggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLP GTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDR YTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAA SGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVKGRFTISRDNSKN TLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
524	WW0766	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryysssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpGPAGLYAQpgsEVQLVESGGGLVQPG NSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRF TISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsgggg sggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQ QLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQS YDRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLS CAASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVKGRFTISRD NSKNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
525	WW0767	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryysssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLYAQpgsEVQLVESGGGLVQPGNSL RLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTIS RDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgg ggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGdeTVKWYQQLP GTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDR YTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAA SGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVKGRFTISRDNSKN TLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
526	WW0768	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryysssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpGPAGLYAQpgsEVQLVESGGGLVQPG NSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRF TISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsgggg

		sggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGdeTVKWYQQ LPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSY DRYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSC AASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVKGRFTISRDNS KNTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
527	WW0769	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqllkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLYAQpgsEVQLVESGGGLVQPGNSL RLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTIS RDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgg ggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLP GTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDR YTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypgavtvawkadsspvkagv etttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
528	WW0770	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqllkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpGPAGLYAQpgsEVQLVESGGGLVQPG NSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRF TISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsgggg sggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQ QLPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQS YDRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypgavtvawkadsspv kagvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
529	WW0771	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqllkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssasggpGPAGLYAQpgsEVQLVESGGGLVQPGNSL RLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTIS RDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgg ggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGdeTVKWYQQLP GTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDR YTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypgavtvawkadsspvkagv etttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
530	WW0772	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqllkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpGPAGLYAQpgsEVQLVESGGGLVQPG NSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRF TISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsgggg sggggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGdeTVKWYQQ LPGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSY DRYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypgavtvawkadsspvka gvetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**

531	WW0796	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktarcklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSFPpgsEVQLVESGGGLVQPGNSLR LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgggg sggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPG TAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRY THPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAAS GFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVKGRFTISRDNSKN TLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
532	WW0797	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpALFKSSFPpgsEVQLVESGGGLVQPGN SLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFT ISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsg gggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQL PGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYD RYTHPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCA ASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVKGRFTISRDNSK NTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
533	WW0798	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktarcklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSFPpgsEVQLVESGGGLVQPGNSLR LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgggg sggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGdeTVKWYQQLPGT APKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRYT HPALLFGTGTKVTVLggggsggggsggggsQVQLVESGGGVVQPGRSLRLSCAASGF

		TFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVKGRFTISRDNSKNTL YLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
534	WW0799	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpALFKSSFPpgsEVQLVESGGGLVQPGN SLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFT ISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsg gggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGdeTVKWYQQL PGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYD RYTHPALLFGTGTKVTVLggggsggggsgggggsQVQLVESGGGVVQPGRSLRLSCA ASGFTFSSYGMHWVRQAPGKGLEWVAFIRYeGSNKYYAeSVKGRFTISRDNSK NTLYLQMNSLRAEDTAVYYCKTHGSHDNWGQGTMVTVSS**
535	WW0800	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrvipvsgparclsqsrnllkttddmvktareklkhysctaedidheditrdqtstlktclplelhknesclatretssttrgs clppqktslmmtlclgsiyedlkmyqtefqainaalqnhnhqqiildkgmlvaidelmqslnhngetlrqkppvgead pyrvkmklcillhafstrvvtinrvmgylssasggpALFKSSFPpgsEVQLVESGGGLVQPGNSLR LSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFTISR DNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsgggg sggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQLPG TAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYDRY THPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypgavtvawkadsspvkagvett tpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
536	WW0801	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpALFKSSFPpgsEVQLVESGGGLVQPGN SLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFT ISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsg gggsggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGSNTVKWYQQL PGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYD RYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypgavtvawkadsspvkag vetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**

537	WW0802	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpALFKSSFPpgsEVQLVESGGGLVQPGN SLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFT ISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsg ggssggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGdeTVKWYQQL PGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYD RYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypgavtvawkadsspvkag vetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
538	WW0803	iwelkkdvyvveldwypdapgemvvltcdtpeedgitwtldqssevlgsgktltiqvkefgdagqytchkggevlshs llllhkkedgiwstdilkdqkepknktflrceaknysgrftcwwlttistdltfsvkssrgssdpqgvtcgaatlsaervrgd nkeyeysvecqedsacpaaeeslpievmvdavhklkyenytssffirdiikpdppknlqlkplknsrqvevsweypdt wstphsyfsltfcvqvqgkskrekkdrvftdktsatvicrknasisvraqdryyssswsewasvpcsggggsggggsgg ggsrnlpvatpdpgmfpclhhsqnllravsnmlqkarqtlefypctseeidheditkdktstveaclpleltknesclnsre tsfitngsclasrktsfmmalclssiyedlkmyqvefktmnakllmdpkrqifldqnmlavidelmqalnfnsetvpqk ssleepdfyktkiklcillhafriravtidrvmsylnassggpALFKSSFPpgsEVQLVESGGGLVQPGN SLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKGRFT ISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSggggsggggsg ggssggggsggggsggggsQSVLTQPPSVSGAPGQRVTISCSGSRSNIGdeTVKWYQQL PGTAPKLLIYYNDQRPSGVPDRFSGSKSGTSASLAITGLQAEDEADYYCQSYD RYTHPALLFGTGTKVTVLgqpkaapsvtlfppsseelqankatlvclisdfypgavtvawkadsspvkag vetttpskqsnnkyaassylsltpeqwkshrsyscqvthegstvektvaptecs**
539	WW0643	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSCDLPHTYNLRNKRALKVLAQMRRLTPL SCLKDRKDFGFPLEKVDAQQIQKAQSIPVLRDLTQQILNLFASKDSSAAWNAT LLDSFCNDLHQQLNDLQGCLMQQVGVQESPLTQEDSLLAVRIYFHRITVFLRE KKHSPCAWEVVRAEVWRALSSSANVLGRLREEKASGGPGPAGLYAQPGSEV QLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGS GRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQ GTLVTVSS
540	WW0644	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSCDLPHTYNLRNKRALKVLAQMRRLTPLS CLKDRKDFGFPLEKVDAQQIQKAQSIPVLRDLTQQILNLFASKDSSAAWNATL LDSFCNDLHQQLNDLQGCLMQQVGVQESPLTQEDSLLAVRIYFHRITVFLREK KHSPCAWEVVRAEVWRALSSSANVLGRLREEKASGGPALFKSSFPPGSEVQL VESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSS

541	WW0645	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSCNLSQTHSLNNRRTLMLMAQMRRISPFS CLKDRHDFEFPQEEFDGNQFQKAQAISVLHEMMQQTFNLFSTKNSSAAWDET LLEKFYIELFQQMNDLEACVIQEVGVEETPLMNEDSILAVKKYFQRITLYLME KKYSPCAWEVVRAEIMRSLSFSTNLQKRLRRKDSGGPGPAGLYAQPGSEVQL VESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSS
542	WW0646	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSCNLSQTHSLNNRRTLMLMAQMRRISPFSC LKDRHDFEFPQEEFDGNQFQKAQAISVLHEMMQQTFNLFSTKNSSAAWDETL LEKFYIELFQQMNDLEACVIQEVGVEETPLMNEDSILAVKKYFQRITLYLMEK KYSPCAWEVVRAEIMRSLSFSTNLQKRLRRKDSGGPALFKSSFPPGSEVQLVES GGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSS
543	WW0647	CDLPHTYNLRNKRALKVLAQMRRLTPLSCLKDRKDFGFPLEKVDAQQIQKAQ SIPVLRDLTQQILNLFASKDSSAAWNATLLDSFCNDLHQQLNDLQGCLMQQV GVQESPLTQEDSLLAVRIYFHRITVFLREKKHSPCAWEVVRAEVWRALSSSAN VLGRLREEKAHHHHHH

544	WW0648	CNLSQTHSLNNRRTLMLMAQMRRISPFSCLKDRHDFEFPQEEFDGNQFQKAQ AISVLHEMMQQTFNLFSTKNSSAAWDETLLEKFYIELFQQMNDLEACVIQEVG VEETPLMNEDSILAVKKYFQRITLYLMEKKYSPCAWEVVRAEIMRSLSFSTNL QKRLRRKDHHHHHH
545	WW0781	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSCDLPQTHSLGSRRTLMLLAQMRRISLFS CLKDRHDFGFPQEEFGNQFQKAETIPVLHEMIQQIFNLFSTKDSSAAWDETLLD KFYTELYQQLNDLEACVIQGVGVEETPLMKEDSILAVRKYFQRITLYLKEKKY SPCAWEVVRAEIMRSFSLSTNLQESLRSKESGGPGPAGLYAQPGSEVQLVESG GGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLY AESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTV SS
546	WW0782	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSCNLSQTHSLNNRRTLMLMAQMRRISPFS CLKDRHDFEFPQEEFDGNQFQKAQAISVLHEMMQQTFNLFSTKDSSAAWDET LLEKFYIELFQQMNDLEACVIQEVGVEETPLMNEDSILAVKKYFQRITLYLME KKYSPCAWEVVRAEIMRSLSFSTNLQKRLRRKDSGGPGPAGLYAQPGSEVQL VESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSS

547	WW0783	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSCDLPQTHSLNNRRTLMLMAQMRRISPFS CLKDRHDFEFPQEEFDGNQFQKAQAISVLHEMMQQTFNLFSTKDSSAAWDET LLEKFYIELFQQMNDLEACVIQEVGVEETPLMNEDSILAVKKYFQRITLYLME KKYSPCAWEVVRAEIMRSLSFSTNLQKRLRRKDSGGPGPAGLYAQPGSEVQL VESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGR DTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGT LVTVSS
548	WW0784	CDLPQTHSLGSRRTLMLLAQMRRISLFSCLKDRHDFGFPQEEFGNQFQKAETIP VLHEMIQQIFNLFSTKDSSAAWDETLLDKFYTELYQQLNDLEACVIQGVGVEE TPLMKEDSILAVRKYFQRITLYLKEKKYSPCAWEVVRAEIMRSFSLSTNLQESL RSKEHHHHHH
549	WW0785	CNLSQTHSLNNRRTLMLMAQMRRISPFSCLKDRHDFEFPQEEFDGNQFQKAQ AISVLHEMMQQTFNLFSTKDSSAAWDETLLEKFYIELFQQMNDLEACVIQEVG VEETPLMNEDSILAVKKYFQRITLYLMEKKYSPCAWEVVRAEIMRSLSFSTNL QKRLRRKDHHHHHH
550	WW0786	CDLPQTHSLNNRRTLMLMAQMRRISPFSCLKDRHDFEFPQEEFDGNQFQKAQ AISVLHEMMQQTFNLFSTKDSSAAWDETLLEKFYIELFQQMNDLEACVIQEVG VEETPLMNEDSILAVKKYFQRITLYLMEKKYSPCAWEVVRAEIMRSLSFSTNL QKRLRRKDHHHHHH

551	WW0815	EAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKT CVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQH KDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYA EQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERA FKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAK YMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQE VCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANP PACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQV STPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSE HVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKK QTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVT RCKDALASGGPALFKSSFPPGSCDLPQTHNLRNKRALTLLVQMRRLSPLSCLK DRKDFGFPQEKVDAQQIKKAQAIPVLSELTQQILNIFTSKDSSAAWNTTLLDSF CNDLHQQLNDLQGCLMQQVGVQEFPLTQEDALLAVRKYFHRITVYLREKKH SPCAWEVVRAEVWRALSSSANVLGRLREEKSGGPALFKSSFPPGSEAHKSEIA HRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESAA NCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSLP PFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEILT QCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAVA RLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKYMCENQA TISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEA KDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTVL AEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAA RNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGS LVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVK HKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALAH HHHHH
552	WW0816	EAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKT CVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQH KDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYA EQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERA FKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAK YMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQE VCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANP PACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQV STPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSE HVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKK QTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVT RCKDALASGGPALFKSSFPPGSCDLPHTYNLRNKRALKVLAQMRRLTPLSCLK DRKDFGFPLEKVDAQQIQKAQSIPVLRDLTQQILNLFASKDSSAAWNATLLDS FCNDLHQQLNDLQGCLMQQVGVQESPLTQEDSLLAVRIYFHRITVFLREKKHS PCAWEVVRAEVWRALSSSANVLGRLREEKASGGPALFKSSFPPGSEAHKSEIA HRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESAA NCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSLP PFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEILT QCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAVA RLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKYMCENQA TISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAEA KDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTVL AEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEAA RNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSGS LVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELVK HKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALAH HHHHH
553	WW0817	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSCDLPQTHNLRNKRALTLLVQMRRLSPLSC LKDRKDFGFPQEKVDAQQIKKAQAIPVLSELTQQILNIFTSKDSSAAWNTTLLD SFCNDLHQQLNDLQGCLMQQVGVQEFPLTQEDALLAVRKYFHRITVYLREKK

		HSPCAWEVVRAEVWRALSSSANVLGRLREEKSGGPALFKSSFPPGSEAHKSEI AHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVADESA ANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHKDDNPSL PPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQYNEIL TQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKAWAV ARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKYMCENQ ATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCKNYAE AKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPACYGTV LAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPTLVEA ARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTKCCSG SLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTALAELV KHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCKDALA HHHHHH
554	WW0818	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSCDLPHTYNLRNKRALKVLAQMRRLTPLS CLKDRKDFGFPLEKVDAQQIQKAQSIPVLRDLTQQILNLFASKDSSAAWNATL LDSFCNDLHQQLNDLQGCLMQQVGVQESPLTQEDSLLAVRIYFHRITVFLREK KHSPCAWEVVRAEVWRALSSSANVLGRLREEKASGGPALFKSSFPPGSEAHK SEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKTCVAD ESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQHKDD NPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYAEQY NEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERAFKA WAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAKYM CENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQEVCK NYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANPPAC YGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQVSTPT LVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSEHVTK CCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKKQTAL AELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVTRCK DALAHHHHHH
555	WW0819	EAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKT CVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQH KDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYA EQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERA FKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAK YMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQE VCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANP PACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQV STPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSE HVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKK QTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVT RCKDALASGGPALFKSSFPPGSCDLPQTHNLRNKRALTLLVQMRRLSPLSCLK DRKDFGFPQEKVDAQQIKKAQAIPVLSELTQQILNIFTSKDSSAAWNTTLLDSF CNDLHQQLNDLQGCLMQQVGVQEFPLTQEDALLAVRKYFHRITVYLREKKH SPCAWEVVRAEVWRALSSSANVLGRLREEKSGGPALFKSSFPPGSEVQLVESG GGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLY AESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTV SSHHHHHH
556	WW0820	EAHKSEIAHRYNDLGEQHFKGLVLIAFSQYLQKCSYDEHAKLVQEVTDFAKT CVADESAANCDKSLHTLFGDKLCAIPNLRENYGELADCCTKQEPERNECFLQH KDDNPSLPPFERPEAEAMCTSFKENPTTFMGHYLHEVARRHPYFYAPELLYYA EQYNEILTQCCAEADKESCLTPKLDGVKEKALVSSVRQRMKCSSMQKFGERA FKAWAVARLSQTFPNADFAEITKLATDLTKVNKECCHGDLLECADDRAELAK YMCENQATISSKLQTCCDKPLLKKAHCLSEVEHDTMPADLPAIAADFVEDQE VCKNYAEAKDVFLGTFLYEYSRRHPDYSVSLLLRLAKKYEATLEKCCAEANP PACYGTVLAEFQPLVEEPKNLVKTNCDLYEKLGEYGFQNAILVRYTQKAPQV STPTLVEAARNLGRVGTKCCTLPEDQRLPCVEDYLSAILNRVCLLHEKTPVSE HVTKCCSGSLVERRPCFSALTVDETYVPKEFKAETFTFHSDICTLPEKEKQIKK

		QTALAELVKHKPKATAEQLKTVMDDFAQFLDTCCKAADKDTCFSTEGPNLVT RCKDALASGGPALFKSSFPPGSCDLPHTYNLRNKRALKVLAQMRRLTPLSCLK DRKDFGFPLEKVDAQQIQKAQSIPVLRDLTQQILNLFASKDSSAAWNATLLDS FCNDLHQQLNDLQGCLMQQVGVQESPLTQEDSLLAVRIYFHRITVFLREKKHS PCAWEVVRAEVWRALSSSANVLGRLREEKASGGPALFKSSFPPGSEVQLVESG GGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLY AESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTV SSHHHHHH
557	WW0821	DAHKSEVAHRFKDLGEENFKALVLIAFAQYLQQCPFEDHVKLVNEVTEFAKT CVADESAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEPERNECFLQ HKDDNPNLPRLVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLFF AKRYKAAFTECCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGER AFKAWAVARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADL AKYICENQDSISSKLKECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKD VCKNYAEAKDVFLGMFLYEYARRHPDYSVVLLLRLAKTYETTLEKCCAAAD PHECYAKVFDEFKPLVEEPQNLIKQNCELFEQLGEYKFQNALLVRYTKKVPQV STPTLVEVSRNLGKVGSKCCKHPEAKRMPCAEDYLSVVLNQLCVLHEKTPVS DRVTKCCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIK KQTALVELVKHKPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKL VAASQAALGLSGGPALFKSSFPPGSCDLPQTHSLGSRRTLMLLAQMRRISLFSC LKDRHDFGFPQEEFGNQFQKAETIPVLHEMIQQIFNLFSTKDSSAAWDETLLDK FYTELYQQLNDLEACVIQGVGVTETPLMKEDSILAVRKYFQRITLYLKEKKYS PCAWEVVRAEIMRSFSLSTNLQESLRSKESGGPALFKSSFPPGSDAHKSEVAHR FKDLGEENFKALVLIAFAQYLQQCPFEDHVKLVNEVTEFAKTCVADESAENC DKSLHTLFGDKLCTVATLRETYGEMADCCAKQEPERNECFLQHKDDNPNLPR LVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLFFAKRYKAAFTE CCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGERAFKAWAVAR LSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADLAKYICENQDSI SSKLKECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKNYAEAKD VFLGMFLYEYARRHPDYSVVLLLRLAKTYETTLEKCCAAADPHECYAKVFDE FKPLVEEPQNLIKQNCELFEQLGEYKFQNALLVRYTKKVPQVSTPTLVEVSRN LGKVGSKCCKHPEAKRMPCAEDYLSVVLNQLCVLHEKTPVSDRVTKCCTESL VNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIKKQTALVELVKH KPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKLVAASQAALGL
558	WW0822	DAHKSEVAHRFKDLGEENFKALVLIAFAQYLQQCPFEDHVKLVNEVTEFAKT CVADESAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEPERNECFLQ HKDDNPNLPRLVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLFF AKRYKAAFTECCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGER AFKAWAVARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADL AKYICENQDSISSKLKECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKD VCKNYAEAKDVFLGMFLYEYARRHPDYSVVLLLRLAKTYETTLEKCCAAAD PHECYAKVFDEFKPLVEEPQNLIKQNCELFEQLGEYKFQNALLVRYTKKVPQV STPTLVEVSRNLGKVGSKCCKHPEAKRMPCAEDYLSVVLNQLCVLHEKTPVS DRVTKCCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIK KQTALVELVKHKPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKL VAASQAALGLSGGPALFKSSFPPGSCNLSQTHSLNNRRTLMLMAQMRRISPFS CLKDRHDFEFPQEEFDGNQFQKAQAISVLHEMMQQTFNLFSTKNSSAAWDET LLEKFYIELFQQMNDLEACVIQEVGVEETPLMNEDSILAVKKYFQRITLYLME KKYSPCAWEVVRAEIMRSLSFSTNLQKRLRRKDSGGPALFKSSFPPGSDAHKS EVAHRFKDLGEENFKALVLIAFAQYLQQCPFEDHVKLVNEVTEFAKTCVADE SAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEPERNECFLQHKDDN PNLPRLVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLFFAKRYK AAFTECCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGERAFKA WAVARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADLAKYIC ENQDSISSKLKECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKN YAEAKDVFLGMFLYEYARRHPDYSVVLLLRLAKTYETTLEKCCAAADPHECY AKVFDEFKPLVEEPQNLIKQNCELFEQLGEYKFQNALLVRYTKKVPQVSTPTL VEVSRNLGKVGSKCCKHPEAKRMPCAEDYLSVVLNQLCVLHEKTPVSDRVT KCCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIKKQTA

		LVELVKHKPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKLVAAS QAALGL
559	WW0831	DAHKSEVAHRFKDLGEENFKALVLIAFAQYLQQCPFEDHVKLVNEVTEFAKT CVADESAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEPERNECFLQ HKDDNPNLPRLVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLFF AKRYKAAFTECCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGER AFKAWAVARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADL AKYICENQDSISSKLKECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKD VCKNYAEAKDVFLGMFLYEYARRHPDYSVVLLLRLAKTYETTLEKCCAAAD PHECYAKVFDEFKPLVEEPQNLIKQNCELFEQLGEYKFQNALLVRYTKKVPQV STPTLVEVSRNLGKVGSKCCKHPEAKRMPCAEDYLSVVLNQLCVLHEKTPVS DRVTKCCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIK KQTALVELVKHKPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKL VAASQAALGLSGGPALFKSSFPPGSCDLPQTHSLGNRRALILLAQMRRISPFSC LKDRHDFEFPQEEFDDKQFQKAQAISVLHEMIQQTFNLFSTKDSSAALDETLL DEFYIELDQQLNDLESCVMQEVGVIESPLMYEDSILAVRKYFQRITLYLTEKKY SSCAWEVVRAEIMRSFSLSINLQKRLKSKESGGPALFKSSFPPGSDAHKSEVAH RFKDLGEENFKALVLIAFAQYLQQCPFEDHVKLVNEVTEFAKTCVADESAEN CDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEPERNECFLQHKDDNPNLP RLVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLFFAKRYKAAFT ECCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGERAFKAWAVA RLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADLAKYICENQD SISSKLKECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKNYAEA KDVFLGMFLYEYARRHPDYSVVLLLRLAKTYETTLEKCCAAADPHECYAKVF DEFKPLVEEPQNLIKQNCELFEQLGEYKFQNALLVRYTKKVPQVSTPTLVEVS RNLGKVGSKCCKHPEAKRMPCAEDYLSVVLNQLCVLHEKTPVSDRVTKCCTE SLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIKKQTALVELV KHKPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKLVAASQAALG L
560	WW0832	DAHKSEVAHRFKDLGEENFKALVLIAFAQYLQQCPFEDHVKLVNEVTEFAKT CVADESAENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEPERNECFLQ HKDDNPNLPRLVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLFF AKRYKAAFTECCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGER AFKAWAVARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADL AKYICENQDSISSKLKECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKD VCKNYAEAKDVFLGMFLYEYARRHPDYSVVLLLRLAKTYETTLEKCCAAAD PHECYAKVFDEFKPLVEEPQNLIKQNCELFEQLGEYKFQNALLVRYTKKVPQV STPTLVEVSRNLGKVGSKCCKHPEAKRMPCAEDYLSVVLNQLCVLHEKTPVS DRVTKCCTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIK KQTALVELVKHKPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKL VAASQAALGLSGGPALFKSSFPPGSCDLPQTHSLGNRRALILLAQMGRISHFSC LKDRYDFGFPQEVFDGNQFQKAQAISAFHEMIQQTFNLFSTKDSSAAWDETLL DKFYIELFQQLNDLEACVTQEVGVEEIALMNEDSILAVRKYFQRITLYLMGKK YSPCAWEVVRAEIMRSFSFSTNLQKGLRRKDSGGPALFKSSFPPGSDAHKSEV AHRFKDLGEENFKALVLIAFAQYLQQCPFEDHVKLVNEVTEFAKTCVADESA ENCDKSLHTLFGDKLCTVATLRETYGEMADCCAKQEPERNECFLQHKDDNPN LPRLVRPEVDVMCTAFHDNEETFLKKYLYEIARRHPYFYAPELLFFAKRYKAA FTECCQAADKAACLLPKLDELRDEGKASSAKQRLKCASLQKFGERAFKAWA VARLSQRFPKAEFAEVSKLVTDLTKVHTECCHGDLLECADDRADLAKYICEN QDSISSKLKECCEKPLLEKSHCIAEVENDEMPADLPSLAADFVESKDVCKNYA EAKDVFLGMFLYEYARRHPDYSVVLLLRLAKTYETTLEKCCAAADPHECYAK VFDEFKPLVEEPQNLIKQNCELFEQLGEYKFQNALLVRYTKKVPQVSTPTLVE VSRNLGKVGSKCCKHPEAKRMPCAEDYLSVVLNQLCVLHEKTPVSDRVTKC CTESLVNRRPCFSALEVDETYVPKEFNAETFTFHADICTLSEKERQIKKQTALV ELVKHKPKATKEQLKAVMDDFAAFVEKCCKADDKETCFAEEGKKLVAASQA ALGL
561	WW0833	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSCDLPQTHSLGNRRALILLAQMRRISPFSCL

		KDRHDFEFPQEEFDDKQFQKAQAISVLHEMIQQTFNLFSTKDSSAALDETLLD EFYIELDQQLNDLESCVMQEVGVIESPLMYEDSILAVRKYFQRITLYLTEKKYS SCAWEVVRAEIMRSFSLSINLQKRLKSKESGGPALFKSSFPPGSEVQLVESGGG LVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAES VKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS
562	WW0834	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSCDLPQTHSLGNRRALILLAQMGRISHFSCL KDRYDFGFPQEVFDGNQFQKAQAISAFHEMIQQTFNLFSTKDSSAAWDETLLD KFYIELFQQLNDLEACVTQEVGVEEIALMNEDSILAVRKYFQRITLYLMGKKY SPCAWEVVRAEIMRSFSFSTNLQKGLRRKDSGGPALFKSSFPPGSEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS
563	WW0737	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSINYKQLQLQERTNIRKCQELLEQLNGKIN LTYRADFKIPMEMTEKMQKSYTAFAIQEMLQNVFLVFRNNFSSTGWNETIVV RLLDELHQQTVFLKTVLEEKQEERLTWEMSSTALHLKSYYWRVQRYLKLMK YNSYAWMVVRAEIFRNFLIIRRLTRNFQNSGGPGPAGLYAQPGSEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS
564	WW0738	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSINYKQLQLQERTNIRKCQELLEQLNGKINL TYRADFKIPMEMTEKMQKSYTAFAIQEMLQNVFLVFRNNFSSTGWNETIVVR LLDELHQQTVFLKTVLEEKQEERLTWEMSSTALHLKSYYWRVQRYLKLMKY NSYAWMVVRAEIFRNFLIIRRLTRNFQNSGGPALFKSSFPPGSEVQLVESGGGL VQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESV KGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS
565	WW0739	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSINYKQLQLQERTNIRKSQELLEQLNGKIN LTYRADFKIPMEMTEKMQKSYTAFAIQEMLQNVFLVFRNNFSSTGWNETIVV RLLDELHQQTVFLKTVLEEKQEERLTWEMSSTALHLKSYYWRVQRYLKLMK YNSYAWMVVRAEIFRNFLIIRRLTRNFQNSGGPGPAGLYAQPGSEVQLVESGG GLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYA ESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS
566	WW0740	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSINYKQLQLQERTNIRKSQELLEQLNGKINL TYRADFKIPMEMTEKMQKSYTAFAIQEMLQNVFLVFRNNFSSTGWNETIVVR LLDELHQQTVFLKTVLEEKQEERLTWEMSSTALHLKSYYWRVQRYLKLMKY NSYAWMVVRAEIFRNFLIIRRLTRNFQNSGGPALFKSSFPPGSEVQLVESGGGL VQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESV KGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSS
567	WW0741	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSMSYNLLGFLQRSSNFQCQKLLWQLNGR LEYCLKDRMNFDIPEEIKQLQQFQKEDAALTIYEMLQNIFAIFRQDSSSTGWNE TIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLK AKEYSHCAWTIVRVEILRNFYFINRLTGYLRNSGGPGPAGLYAQPGSEVQLVE SGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSS
568	WW0742	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSMSYNLLGFLQRSSNFQCQKLLWQLNGRL EYCLKDRMNFDIPEEIKQLQQFQKEDAALTIYEMLQNIFAIFRQDSSSTGWNET

		IVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKA KEYSHCAWTIVRVEILRNFYFINRLTGYLRNSGGPALFKSSFPPGSEVQLVESG GGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGSGRDTLY AESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTV SS
569	WW0743	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSMSYNLLGFLQRSSNFQSQKLLWQLNGR LEYCLKDRMNFDIPEEIKQLQQFQKEDAALTIYEMLQNIFAIFRQDSSSTGWNE TIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLK AKEYSHCAWTIVRVEILRNFYFINRLTGYLRNSGGPGPAGLYAQPGSEVQLVE SGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSS
570	WW0744	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPALFKSSFPPGSMSYNLLGFLQRSSNFQSQKLLWQLNGRL EYCLKDRMNFDIPEEIKQLQQFQKEDAALTIYEMLQNIFAIFRQDSSSTGWNET IVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLKA KEYSHCAWTIVRVEILRNFYFINRLTGYLRNSGGPALFKSSFPPGSEVQLVESG GGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGSGRDTLY AESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTV SS
571	WW0745	INYKQLQLQERTNIRKCQELLEQLNGKINLTYRADFKIPMEMTEKMQKSYTAF AIQEMLQNVFLVFRNNFSSTGWNETIVVRLLDELHQQTVFLKTVLEEKQEERL TWEMSSTALHLKSYYWRVQRYLKLMKYNSYAWMVVRAEIFRNFLIIRRLTR NFQNHHHHHH
572	WW0746	INYKQLQLQERTNIRKSQELLEQLNGKINLTYRADFKIPMEMTEKMQKSYTAF AIQEMLQNVFLVFRNNFSSTGWNETIVVRLLDELHQQTVFLKTVLEEKQEERL TWEMSSTALHLKSYYWRVQRYLKLMKYNSYAWMVVRAEIFRNFLIIRRLTR NFQNHHHHHH
573	WW0747	MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQQFQK EDAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKL EKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINR LTGYLRNHHHHHH
574	WW0748	MSYNLLGFLQRSSNFQSQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQQFQKE DAALTIYEMLQNIFAIFRQDSSSTGWNETIVENLLANVYHQINHLKTVLEEKLE KEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRL TGYLRNHHHHHH
575	WW0787	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSMSYNLLGFLQRSSNFQCQKLLWQLNGR LEYCLKDRMNFDIPEEIKQLQQFQKEDAALTIYEMLQNIFAIFRQDSSSTGWQE TIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLK AKEYSHCAWTIVRVEILRNFYFINRLTGYLRNSGGPGPAGLYAQPGSEVQLVE SGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSS
576	WW0788	EVQLVESGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSIS GSGRDTLYAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVS SQGTLVTVSSSGGPGPAGLYAQPGSMSYNLLGFLQRSSNFQSQKLLWQLNGR LEYCLKDRMNFDIPEEIKQLQQFQKEDAALTIYEMLQNIFAIFRQDSSSTGWQE TIVENLLANVYHQINHLKTVLEEKLEKEDFTRGKLMSSLHLKRYYGRILHYLK AKEYSHCAWTIVRVEILRNFYFINRLTGYLRNSGGPGPAGLYAQPGSEVQLVE SGGGLVQPGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGSGRDTL YAESVKGRFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVT VSS

577	WW0789	MSYNLLGFLQRSSNFQCQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQQFQK EDAALTIYEMLQNIFAIFRQDSSSTGWQETIVENLLANVYHQINHLKTVLEEKL EKEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINR LTGYLRNHHHHHH
578	WW0790	MSYNLLGFLQRSSNFQSQKLLWQLNGRLEYCLKDRMNFDIPEEIKQLQQFQKE DAALTIYEMLQNIFAIFRQDSSSTGWQETIVENLLANVYHQINHLKTVLEEKLE KEDFTRGKLMSSLHLKRYYGRILHYLKAKEYSHCAWTIVRVEILRNFYFINRL TGYLRNHHHHHH
579	WW0729	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPGGGGSGGGPGSEVQLVESGGGLVQ PGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSGGGGS GGGGSGGGGSGGGGSGGGGSGGGGSSGGPGGGGSGGGPGSEVQLVESGGGL VQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVR GRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTV SSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVH TFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSC
580	WW0734	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPGPAGMKGLPGSEVQLVESGGGLVQ PGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSGGGGS GGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSEVQLVESGGGL VQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVR GRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTV SSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVH TFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSC
581	WW0735	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPGPAGLYAQPGSEVQLVESGGGLVQP GNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSGGGGS GGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSEVQLVESGGGL VQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVR GRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTV SSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVH TFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSC
582	WW0736	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPALFKSSFPPGSEVQLVESGGGLVQP GNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSGGGGS GGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSGGGGSEVQLVESGGGL VQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAIDSSSYTYSPDTVR GRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDALDYWGQGTTVTV SSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVH TFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKRVEPKSC
583	WW0792	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYTLAWVRQAPGKGLEWVAAID SSSYTYSPDTVRGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARDSNWDAL DYWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVS

		WNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTK VDKRVEPKSCHHHHHH
584	WW0061	APTSSSTKKTQLQLEHLLLDLQMILNGINNYKNPKLTRMLTFKFYMPKKATEL KHLQCLEEELKPLEEVLNLAQSKNFHLRPRDLISNINVIVLELKGSETTFMCEY ADETATIVEFLNRWITFCQSIISTLTSGGPGPAGMKGLPGSEVQLVESGGGLVQ PGNSLRLSCAASGFTFSKFGMSWVRQAPGKGLEWVSSISGSGRDTLYAESVKG RFTISRDNAKTTLYLQMNSLRPEDTAVYYCTIGGSLSVSSQGTLVTVSSHHHH HH
585	ACP293 (WW0237)	QVQLQESGGGLVQTGGSLRLSCTTSGTIFSGYTMGWYRQAPGEQRELVAVISG GGDTNYADSVKGRFTISRDNTKDTMYLQMNSLKPEDTAVYYCYSREVTPPW KLYWGQGTQVTVSSAAAYPYDVPDYGSHHHHHH
586	ACP294 (WW0238)	QVQLQESGGGLVQEGGSLRLSCAASERIFSTDVMGWYRQAAEKQRELVAVVS ARGTTNYLDAVKGRFTISRDNARNTLTLQMNDLKPEDTASYYCYVRETTSPW RIYWGQGTQVTVSSAAAYPYDVPDYGSHHHHHH
587	ACP295 (WW0239)	QVQLQESGGGLVQAGGSLRLSCAASGSIFSANAMGWYRQAPGKQRELVAVIS SGGSTNYADSVKGRFTISRDNAKNTVYLQMNSLKPEDTAVYYCMYSGSYYY TPNDYWGQGTQVTVSSAAAYPYDVPDYGSHHHHHH
588	ACP315 (WW0368)	EVQLLESGGGLVQPGGSLRLSCAASGSIFSANAMGWYRQAPGKQRELVAVISS GGSTNYADSVKGRFTISRDNSKNTVYLQMNSLRAEDTAVYYCMYSGSYYYTP NDYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
589	ACP316 (WW0369)	EVQLLESGGGLVQPGGSLRLSCAASGSIFSANAMGWYRQAPGKGLELVAVISS GGSTNYADSVKGRFTISRDNSKNTVYLQMNSLRAEDTAVYYCMYSGSYYYTP NDYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
590	ACP317 (WW0370)	EVQLLESGGGLVQPGGSLRLSCAASGSIFSANAMGWVRQAPGKGLEWVSVIS SGGSTNYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCMYSGSYYYT PNDYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
591	ACP318 (WW0371)	QVQLLESGGGLVQPGGSLRLSCAASGSIFSANAMGWYRQAPGKQRELVAVIS SGGSTNYADSVKGRFTISRDNSKNTVYLQMNSLRAEDTAVYYCMYSGSYYYT PNDYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
592	ACP319 (WW0372)	EVQLLESGGGLVQPGGSLRLSCAASGSIFSANAMGWYRQAPGKGRELVAVISS GGSTNYADSVKGRFTISRDNSKNTVYLQMNSLRAEDTAVYYCMYSGSYYYTP NDYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
593	ACP320 (WW0373)	QVQLLESGGGLVQAGGSLRLSCAASGSIFSANAMGWYRQAPGKQRELVAVIS SGGSTNYADSVKGRFTISRDNSKNTVYLQMNSLRAEDTAVYYCMYSGSYYYT PNDYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
594	ACP321 (WW0374)	EVQLLESGGGLVQPGGSLRLSCAASERIFSTDVMGWYRQAPGKQRELVAVVS ARGTTNYLDAVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCYVRETTSPW RIYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
595	ACP322 (WW0375)	EVQLLESGGGLVQPGGSLRLSCAASERIFSTDVMGWYRQAPGKGLELVAVVS ARGTTNYLDAVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCYVRETTSPW RIYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
596	ACP323 (WW0376)	EVQLLESGGGLVQPGGSLRLSCAASERIFSTDVMGWVRQAPGKGLEWVSVVS ARGTTNYLDAVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCYVRETTSPW RIYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
597	ACP324 (WW0377)	QVQLLESGGGLVQPGGSLRLSCAASERIFSTDVMGWYRQAPGKQRELVAVVS ARGTTNYLDAVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCYVRETTSPW RIYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
598	ACP325 (WW0378)	EVQLLESGGGLVQPGGSLRLSCAASERIFSTDVMGWYRQAPGKGRELVAVVS ARGTTNYLDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCYVRETTSPW RIYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
599	ACP326 (WW0379)	QVQLLESGGGLVQEGGSLRLSCAASERIFSTDVMGWYRQAAGKQRELVAVVS ARGTTNYLDAVKGRFTISRDNSKNTLYLQMNSLRAEDTASYYCYVRETTSPW RIYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
600	ACP327 (WW0380)	EVQLLESGGGLVQPGGSLRLSCAASERIFSTDVMGWYRQAPGKGLELVAVVS ARGTTNYLDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCYVRETTSPW RIYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH

601	ACP328 (WW0381)	EVQLLESGGGLVQPGGSLRLSCATSGTIFSGYTMGWYRQAPGKQRELVAVISG GGDTNYADSVKGRFTISRDNSKDTMYLQMNSLRAEDTAVYYCYSREVTPPW KLYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
602	ACP329 (WW0382)	EVQLLESGGGLVQPGGSLRLSCATSGTIFSGYTMGWYRQAPGKGLELVAVISG GGDTNYADSVKGRFTISRDNSKDTMYLQMNSLRAEDTAVYYCYSREVTPPW KLYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
603	ACP330 (WW0383)	EVQLLESGGGLVQPGGSLRLSCAASGTIFSGYTMGWVRQAPGKGLEWVSVIS GGGDTNYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCYSREVTPPW KLYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
604	ACP331 (WW0384)	QVQLLESGGGLVQPGGSLRLSCATSGTIFSGYTMGWYRQAPGKQRELVAVIS GGGDTNYADSVKGRFTISRDNSKDTMYLQMNSLRAEDTAVYYCYSREVTPP WKLYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
605	ACP332 (WW0385)	EVQLLESGGGLVQPGGSLRLSCATSGTIFSGYTMGWYRQAPGKQRELVAVISG GGDTNYADSVKGRFTISRDNSKNTMYLQMNSLRAEDTAVYYCYSREVTPPW KLYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
606	ACP333 (WW0386)	EVQLLESGGGLVQPGGSLRLSCATSGTIFSGYTMGWYRQAPGKGRELVAVISG GGDTNYADSVKGRFTISRDNSKNTMYLQMNSLRAEDTAVYYCYSREVTPPW KLYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
607	ACP334 (WW0387)	QVQLLESGGGLVQTGGSLRLSCATSGTIFSGYTMGWYRQAPGKQRELVAVIS GGGDTNYADSVKGRFTISRDNSKDTMYLQMNSLRAEDTAVYYCYSREVTPP WKLYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
608	ACP335 (WW0388_	EVQLLESGGGLVQPGGSLRLSCATSGTIFSGYTMGWYRQAPGKGLELVAVISG GGDTNYADSVKGRFTISRDNSKNTMYLQMNSLRAEDTAVYYCYSREVTPPW KLYWGQGTLVTVSSAAAYPYDVPDYGSHHHHHH
609	MMP14_1	GPAGLYAQ
610	MMP9_1	GPAGMKGL
611	FAPa_1	PGGPAGIG
612	CTSL1_1	ALFKSSFP
613	CTSL1_2	ALFFSSPP
614	ADAM17_ 1	LAQRLRSS
615	ADAM17_ 2	LAQKLKSS
616	ALU30-1	GALFKSSFPSGGGPAGLYAQGGSGKGGSGK
617	ALU30-2	RGSGGGPAGLYAQGSGGGPAGLYAQGGSGK
618	ALU30-3	KGGGPAGLYAQGPAGLYAQGPAGLYAQGSR
619	ALU30-4	RGGPAGLYAQGGPAGLYAQGGGPAGLYAQK
620	ALU30-5	KGGALFKSSFPGGPAGIGPLAQKLKSSGGS
621	ALU30-6	SGGPGGPAGIGALFKSSFPLAQKLKSSGGG
622	ALU30-7	RGPLAQKLKSSALFKSSFPGGPAGIGGGGK
623	ALU30-8	GGGALFKSSFPLAQKLKSSPGGPAGIGGGR
624	ALU30-9	RGPGGPAGIGPLAQKLKSSALFKSSFPGGG
625	ALU30-10	RGGPLAQKLKSSPGGPAGIGALFKSSFPGK
626	ALU30-11	RSGGPAGLYAQALFKSSFPLAQKLKSSGGG
627	ALU30-12	GGPLAQKLKSSALFKSSFPGPAGLYAQGGR
628	ALU30-13	GGALFKSSFPGPAGLYAQPLAQKLKSSGGK

629	ALU30-14	RGGALFKSSFPLAQKLKSSGPAGLYAQGGK
630	ALU30-15	RGGGPAGLYAQPLAQKLKSSALFKSSFPGG
631	ALU30-16	SGPLAQKLKSSGPAGLYAQALFKSSFPGSK
632	ALU30-17	KGGPGGPAGIGPLAQRLRSSALFKSSFPGR
633	ALU30-18	KSGPGGPAGIGALFFSSPPLAQKLKSSGGR
634	ALU30-19	SGGFPRSGGSFNPRTFGSKRKRRGSRGGGG

INCORPORATION BY REFERENCE

[363] The entire disclosures of all patent and non-patent publications cited herein are each incorporated by reference in their entireties for all purposes.

OTHER EMBODIMENTS

[364] The disclosure set forth above may encompass multiple distinct inventions with independent utility. Although each of these inventions has been disclosed in its preferred form(s), the specific embodiments thereof as disclosed and illustrated herein are not to be considered in a limiting sense, because numerous variations are possible. The subject matter of the inventions includes all novel and nonobvious combinations and subcombinations of the various elements, features, functions, and/or properties disclosed herein. The following claims particularly point out certain combinations and subcombinations regarded as novel and nonobvious. Inventions embodied in other combinations and subcombinations of features, functions, elements, and/or properties may be claimed in this application, in applications claiming priority from this application, or in related applications. Such claims, whether directed to a different invention or to the same invention, and whether broader, narrower, equal, or different in scope in comparison to the original claims, also are regarded as included within the subject matter of the inventions of the present disclosure.

CLAIMS

1. A pharmaceutical composition comprising:

(i) a fusion polypeptide comprising a cytokine polypeptide [A], a blocking moiety [D], optionally a half-life extension moiety [H] and a protease-cleavable polypeptide linker; and

(ii) a second therapeutic agent;

wherein the cytokine polypeptide and the blocking moiety and the optional half-life extension element when present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, wherein the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker.

2. The pharmaceutical composition of claim 1, wherein the cytokine polypeptide is selected from the group consisting of IL-2, IL-7, IL-12, IL-15, IL-18, IL-21, IL-23, TGF , interferon alpha, interferon beta, interferon gamma, TNF, TGFbeta, CXCL10, CCL19, CCL20, CCL21, or a mutein, a variant, an active fragment, or a subunit of any of the foregoing.

3. The pharmaceutical composition of claim 2, wherein the cytokine polypeptide is IL-2, IL-12, interferon alpha, interferon beta, or a mutein, a variant, an active fragment, or a subunit of any of the foregoing.

4. The pharmaceutical composition of any one of claims 1-3 wherein the fusion polypeptide has the formula:

[A]-[L1]-[H]-[L2]-[D]

[D]-[L2]-[H]-[L1]-[A]

[A]-[L1]-[D]-[L2]-[H]

[H]-[L2]-[D]-[L1]-[A]

[H]-[L1]-[A]-[L2']-[D]

[D]-[L1]-[A]-[L2']-[H]

wherein [A] is a cytokine polypeptide, [D] is a blocking moiety, [H] is a half-life extension moiety, [L1] is a protease-cleavable polypeptide linker, [L2] is an polypeptide linker that is optionally protease-cleavable, and [L2'] is a protease-cleavable polypeptide linker.

5. The pharmaceutical composition of any one of the preceding claims, wherein the second therapeutic agent is a second fusion polypeptide comprising at least one of each of: a second cytokine polypeptide [A], a blocking moiety [D], optionally a half-life extension element [H] and a protease-cleavable polypeptide linker [L];

wherein the cytokine polypeptide and the cytokine blocking moiety and the optional half-life extension element when present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, wherein the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker.

6. The pharmaceutical composition of claim 4, wherein the second cytokine polypeptide is selected from the group consisting of IL-2, IL-7, IL-12, IL-15, IL-18, IL-21, IL-23, TGF , interferon alpha, interferon beta, interferon gamma, TNF, TGFbeta, CXCL10, CCL19, CCL20, CCL21, a mutein thereof and active fragments thereof.

7. The pharmaceutical composition of claim 5, wherein the second cytokine polypeptide is IL-2, IL-12, interferon alpha, interferon beta, or a mutein, or an active fragment of any of the foregoing.

8. The pharmaceutical composition of any one of claims 4-6 wherein the second fusion polypeptide has the formula:

[A]-[L1]-[H]-[L2]-[D]

[D]-[L2]-[H]-[L1]-[A]

[A]-[L1]-[D]-[L2]-[H]

[H]-[L2]-[D]-[L1]-[A]

[H]-[L1]-[A]-[L2']-[D]

[D]-[L1]-[A]-[L2']-[H]

wherein [A] is a cytokine polypeptide, [D] is a blocking moiety, [H] is a half-life extension moiety, [L1] is a protease-cleavable polypeptide linker, [L2] is an polypeptide linker that is optionally protease-cleavable, and [L2'] is a protease-cleavable polypeptide linker.

9. The pharmaceutical composition of any one of the preceding claims, wherein the first fusion polypeptide comprises a IL-2 polypeptide and the second fusion polypeptide comprises a different IL-2 polypeptide, a IL-12 polypeptide, an interferon alpha polypeptide, an interferon beta polypeptide, or a mutein, or an active fragment of any of the foregoing.

10. The pharmaceutical composition of any one of the preceding claims, wherein the first fusion polypeptide comprises a IL-12 polypeptide and the second fusion polypeptide comprises a different IL-12 polypeptide, a IL-2 polypeptide, an interferon alpha polypeptide, an interferon beta polypeptide, or a mutein, or an active fragment of any of the foregoing.

11. The pharmaceutical composition of any one of the preceding claims, wherein the first fusion polypeptide comprises a interferon alpha polypeptide or an interferon beta polypeptide and the second fusion polypeptide comprises a different interferon alpha polypeptide, a different interferon beta polypeptide, a IL-2 polypeptide, a IL-12 polypeptide, or a mutein, or an active fragment of any of the foregoing.

12. The pharmaceutical composition of any one of the preceding claims, further comprising an additional third therapeutic agent.

13. The pharmaceutical composition of any one of the preceding claims, wherein the second therapeutic agent is an agent for treating cancer.

14. The pharmaceutical composition of any of the preceding claims, wherein the second therapeutic agent is an immunomodulator.

15. The pharmaceutical composition of any one of claims 1-14, wherein the second therapeutic agent is a chemotherapeutic agent, radiation therapy, an immunotherapeutic agent, a T cell agonist cytokine, a CAR-T, antibody-drug conjugate, or an oncolytic virus therapy.

16. The pharmaceutical composition of any one of the preceding claims, wherein each protease-cleavable polypeptide linker independently comprises a sequence that is capable of being cleaved by a protease selected from the group consisting of a kallikrein, thrombin, chymase, carboxypeptidase A, cathepsin G, cathepsin L, an elastase, PR-3, granzyme M, a calpain, a matrix metalloproteinase (MMP), an ADAM, a FAP, a cathepsin L, a plasminogen activator, a cathepsin, a caspase, a tryptase, and a tumor cell surface protease.

17. The pharmaceutical composition of any one of the preceding claims, wherein the half-life extension element comprises a serum albumin binding domain, a serum albumin, transferrin, or immunoglobulin Fc, or fragment thereof.

18. The pharmaceutical composition of any one of the preceding claims, wherein the blocking element comprises an antibody or antigen-binding fragment of an antibody that binds to the cytokine polypeptide.

19. The pharmaceutical composition of anyone of the preceding claims, wherein the fusion polypeptide comprises an amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578.

20. The pharmaceutical composition of any one of the preceding claims, wherein the second therapeutic agent is a second fusion protein that comprises an amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578, and wherein the second fusion protein is not the same.

21. The pharmaceutical composition of any one of the preceding claims, wherein the fusion polypeptide is bonded covalently or noncovalently to a second polypeptide.

22. The pharmaceutical composition of claim 21, wherein the second polypeptide chain and the blocking moiety of the fusion polypeptide are complementary and together form a functional binding site.

23. The pharmaceutical composition of claim 22, wherein the functional binding site has specificity for the cytokine polypeptide contain within the fusional polypeptide.

24. The pharmaceutical composition of any one of claims 21-23, wherein the functional binding site is an Fab fragment of an antibody.

25. The pharmaceutical composition of any one of claims 21-23, wherein the first fusion polypeptide dimerizes.

26. A pharmaceutical composition comprising a (i) a first fusion polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578, and (ii) a second fusion polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-

381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578; wherein the first fusion polypeptide and the second fusion polypeptide are not the same.

27. A pharmaceutical composition comprising a (i) a first fusion polypeptide comprising a first polypeptide chain comprising an amino acid sequence selected from SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 and a second polypeptide sequence comprising the amino acid sequence of SEQ ID NOs: 263, 264, or 333, and (ii) a second therapeutic agent, wherein the second therapeutic agent is a second fusion polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578; wherein the first fusion polypeptide and the second fusion polypeptide are not the same.

28. A fusion polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, and 636-646 or an amino acid sequence that has at least about 80% identity to SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, and 636-646.

29. The fusion polypeptide of claim 16, wherein the fusion polypeptide comprises an amino acid sequence selected from SEQ ID NOs. 272, 286, 362, 336, 348, 363, or 580.

30. A polypeptide comprising a first polypeptide that is covalently or non-covalently bonded to a second polypeptide, wherein the first polypeptide comprises an amino acid sequence selected from SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 or an amino acid sequence that has at least 80% identity to the SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 and the second polypeptide sequence comprises an amino acid sequence of SEQ ID NOs: 263, 264, or 333 or an amino acid sequence that has at least 80% identity to SEQ ID NOs: 263, 264, or 333.

31. A fusion polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs. 368-371, 434-440, 453-519, and 523-538, or an amino acid sequence that has at least about 80% identity to SEQ ID NOs. 368-371, 434-440, 453-519, and 523-538.

32. A fusion polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs. 421-430, and 539-578, or an amino acid sequence that has at least 80% identity to SEQ ID NOs. 421-430, and 539-578.

33. The fusion polypeptide of claim 33, wherein the fusion polypeptide comprises an amino acid sequence selected from SEQ ID NOs.: 424, 428, 541, 556, 560, 568, or 573.

34. A method for treating a cancer or a viral infection associated with cancer comprising administering to a subject in need thereof the pharmaceutical composition or one or more fusion polypeptides of any one of the preceding claims.

35. A nucleic acid encoding the fusion polypeptide of any one of claims 1-27 or 28-33.

36. A vector comprising the nucleic acid of claim 35.

37. A host cell comprising the vector of claim 36.

38. A method of making a pharmaceutical composition, comprising culturing the host cell of claim 37 suitable conditions for expression and collection of the fusion polypeptide.

39. A combination comprising: (i) a therapeutically effective amount of a fusion polypeptide comprising a cytokine polypeptide [A], a blocking moiety [D], optionally a half-life extension moiety [H] and a protease-cleavable polypeptide linker ; and (ii) a therapeutically effective amount of a second therapeutic agent for use in treating a cancer in a subject in need thereof;

wherein the cytokine polypeptide and the cytokine blocking moiety and the optional half-life extension element when present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, wherein the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker.

40. A method of treating a cancer in a subject comprising administering to the subject in need thereof (i) a therapeutically effective amount of a fusion polypeptide comprising a cytokine polypeptide [A], a blocking moiety [D], optionally a half-life extension moiety [H] and a protease-cleavable polypeptide linker; and (ii) a therapeutically effective amount of a second therapeutic agent;

wherein the cytokine polypeptide and the cytokine blocking moiety and the optional half-life extension element when present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, wherein the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine

receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker.

41. The use of claim 39 the method of claim 40, wherein the cytokine polypeptide comprises an amino acid sequence selected from selected from the group consisting of IL-2, IL-7, IL-12, IL-15, IL-18, IL-21, IL-23, TGF, interferon alpha, interferon beta, Interferon gamma, TNF, TGFbeta, CXCL10, CCL19, CCL20, CCL21, or a mutein, or an active fragment of any of the foregoing.

42. The use or method of claim 41, wherein the cytokine polypeptide is IL-2, IL-12, interferon alpha, interferon beta, or a mutein, a variant, an active fragment, or a subunit of any of the foregoing.

43. The use or method of any one of claims 39-42, wherein the fusion polypeptide has the formula:

[A]-[L1]-[H]-[L2]-[D]
[D]-[L2]-[H]-[L1]-[A]
[A]-[L1]-[D]-[L2]-[H]
[H]-[L2]-[D]-[L1]-[A]
[H]-[L1]-[A]-[L2']-[D]
[D]-[L1]-[A]-[L2']-[H]

wherein A is a cytokine polypeptide, D is a blocking moiety, H is a half-life extension moiety, L1 is a protease-cleavable polypeptide linker, L2 is an polypeptide linker that is optionally protease-cleavable, and L2' is a protease-cleavable polypeptide linker.

44. The use or method of any one of claims 39-43, wherein the second therapeutic agent is a second fusion polypeptide comprising a cytokine polypeptide [A], a blocking moiety [D], optionally a half-life extension moiety [H] and a protease-cleavable polypeptide linker ;
wherein the cytokine polypeptide and the cytokine blocking moiety and the optional half-life extension element when present are operably linked by the protease-cleavable polypeptide linker and the fusion polypeptide has attenuated cytokine receptor activating activity, wherein the cytokine-receptor activating activity of the fusion polypeptide is at least about 10X less than the cytokine receptor activating activity of the polypeptide that contains the cytokine polypeptide that is produced by cleavage of the protease cleavable linker.

45. The use or method of claim 44, wherein the second cytokine polypeptide is selected from the group consisting of IL-2, IL-7, IL-12, IL-15, IL-18, IL-21, IL-23, TGF , IFN alpha, IFN beta, IFN

gamma, TNF, TGFbeta, CXCL10, CCL19, CCL20, CCL21, or a mutein, a variant, an active fragment, or a subunit of any of the foregoing.

46. The use or method of claim 45, wherein the cytokine polypeptide is IL-2, IL-12, interferon alpha, interferon beta or a mutein, or an active fragment of any of the foregoing.

47. The use or method of any one of claims 39-46, wherein the second fusion polypeptide has the formula:

[A]-[L1]-[H]-[L2]-[D]
[D]-[L2]-[H]-[L1]-[A]
[A]-[L1]-[D]-[L2]-[H]
[H]-[L2]-[D]-[L1]-[A]
[H]-[L1]-[A]-[L2']-[D]
[D]-[L1]-[A]-[L2']-[H]

wherein A is a cytokine polypeptide, D is a blocking moiety, H is a half-life extension moiety, L1 is a protease-cleavable polypeptide linker, L2 is an polypeptide linker that is optionally protease-cleavable, and L2' is a protease-cleavable polypeptide linker.

48. The use or method of any one of claims 39-47, wherein the first fusion polypeptide comprises a IL-2 polypeptide and the second fusion polypeptide comprises a different IL-2 polypeptide, a IL-12 polypeptide, an interferon alpha polypeptide, an interferon beta polypeptide, or a mutein, or an active fragment of any of the foregoing.

49. The use or method of any one of claims 39-47, wherein the first fusion polypeptide comprises a IL-12 polypeptide and the second fusion polypeptide comprises a different IL-12 polypeptide, a IL-2 polypeptide, an IFNalpha polypeptide, an interferon beta polypeptide, or a mutein, or an active fragment of any of the foregoing.

50. The use or method of any one of claims 39-50, wherein the first fusion polypeptide comprises a interferon alpha polypeptide or an IFN beta polypeptide and the second fusion polypeptide comprises a different interferon alpha polypeptide, a different interferon beta polypeptide, a IL-2 polypeptide, a IL-12 polypeptide, or a mutein, or an active fragment of any of the foregoing.

51. The use or method of any one of the preceding claims, further comprising an additional third therapeutic agent.

52. The use or method of any one of claims 39-51, wherein the second therapeutic agent is an agent for treating cancer.

53. The use or method of any one of claims 39-52, wherein the second therapeutic agent is an immunomodulator.

54. The use or method of claim any one of claims 39-53, wherein the second therapeutic agent is a chemotherapeutic agent, radiation therapy, an immunotherapeutic agent, a T cell agonist cytokine, a CAR-T, antibody-drug conjugate, or an oncolytic virus therapy.

55. The use or method of any one of claims 39-54, wherein each protease-cleavable polypeptide linker independently comprises a sequence that is capable of being cleaved by a protease selected from the group consisting of a kallikrein, thrombin, chymase, carboxypeptidase A, cathepsin G, cathepsin L, an elastase, PR-3, granzyme M, a calpain, a matrix metalloproteinase (MMP), an ADAM, a FAP, a cathepsin L, a plasminogen activator, a cathepsin, a caspase, a tryptase, and a tumor cell surface protease.

56. The use or method of any one of claims 39-55, wherein the half-life extension element comprises a serum albumin binding domain, a serum albumin, transferrin, or immunoglobulin Fc, or fragment thereof.

57. The use or method of any one of claims 39-56, wherein the cytokine blocking moiety comprises an antibody or an antigen-binding fragment of an antibody that binds the cytokine polypeptide.

58. The use or method of any one of claims 39-56, wherein the first fusion polypeptide comprises the amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578.

59. The use or method of any one of claims 39-57, wherein the second therapeutic agent comprises the amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578.

60. The use or method of any one of claims 39-57, wherein the first fusion polypeptide comprises the amino acid selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578 and the second therapeutic agent comprises the amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 636-646, 579-608, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578, wherein the fusion polypeptide and the second therapeutic agent are different.

61. The use or method of any one of claims 39-60, wherein the first fusion polypeptide is bonded covalently or noncovalently to a second polypeptide chain.

62. The use or method of claim 61, wherein the second polypeptide chain and the blocking moiety of the fusion polypeptide are complementary and together form a functional binding site.

63. The use or method of claim 62, wherein the functional binding site has specificity for the cytokine polypeptide contain within the fusional polypeptide.

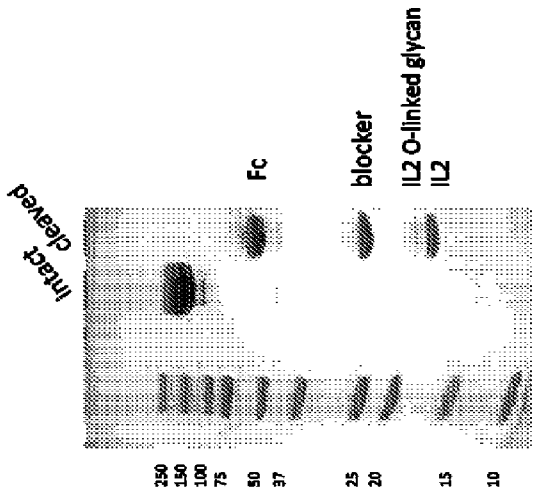
64. The use or method of any one of claims 61-63, wherein the functional binding site is an Fab fragment of an antibody.

65. The use or method of any one of claims 61-64, wherein the first fusion polypeptide dimerizes.

66. The method or use of any one of claims 39-65, wherein the first fusion polypeptide comprises a first polypeptide and second polypeptide, wherein the first polypeptide comprises an amino acid sequence selected from SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 and the second polypeptide sequence comprises an amino acid sequence of SEQ ID NOs: 263, 264, or 333

67. The method or use of any one of claims 39-65, comprising a (i) a first fusion polypeptide comprising a first polypeptide chain comprising an amino acid sequence selected from SEQ ID NOs. 362, 363, 325, 286, 579, 581, or 582 and a second polypeptide sequence comprising the amino acid sequence of SEQ ID NOs: 263, 264, or 333, and (ii) a second therapeutic agent, wherein the second therapeutic agent is a second fusion polypeptide comprising an amino acid sequence selected from the group consisting of SEQ ID NOs. 257-300, 302-317, 325-353, 355-365, 366, 372-381, 383-385, 388-420, 579-608, 636-646, 368-371, 434-440, 453-519, 523-538, 421-430, and 539-578; wherein the first fusion polypeptide and the second fusion polypeptide are not the same.

68. The use or method of any one of claims 39-67, wherein the cancer is melanoma, renal cancer, breast cancer, ovarian cancer, prostate cancer, kidney cancer, pancreatic cancer, brain cancer, bladder cancer, or lung cancer.



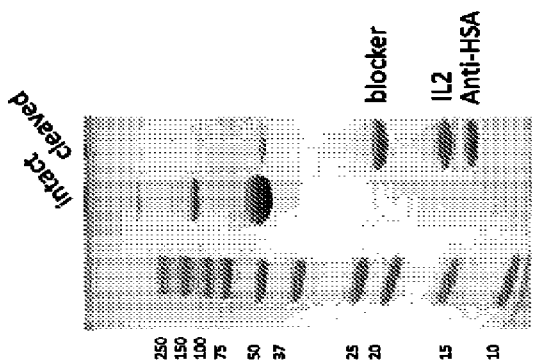
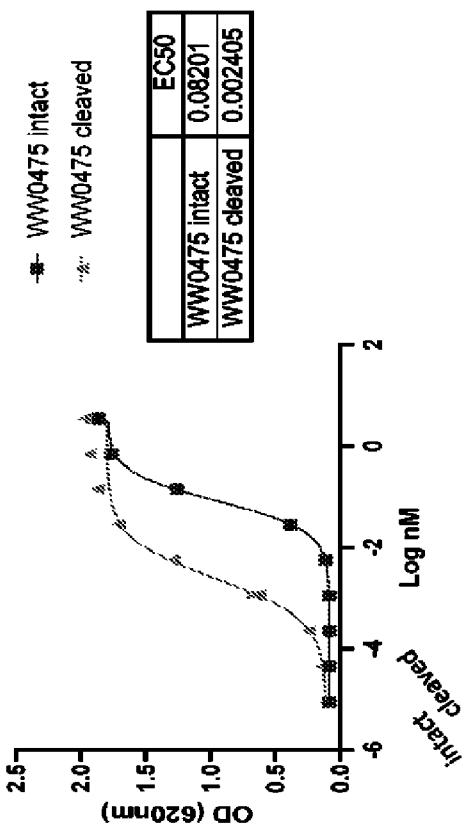
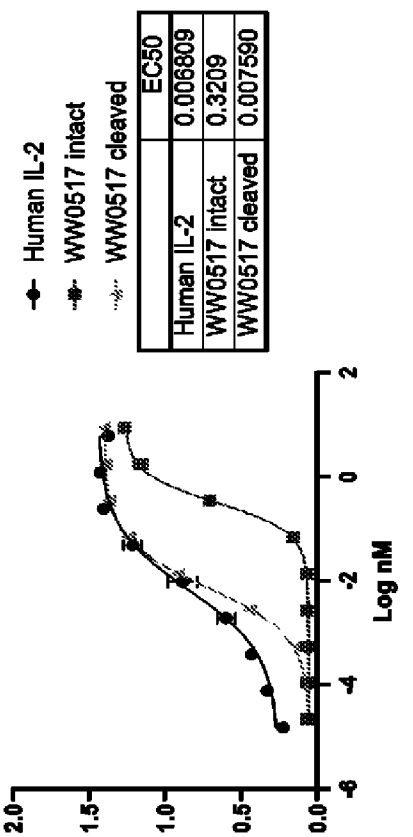


FIG. 1A



	EC50
WW0475 intact	0.08201
WW0475 cleaved	0.002405

FIG. 1B



	EC50
Human IL-2	0.006809
WW0517 intact	0.3209
WW0517 cleaved	0.007590

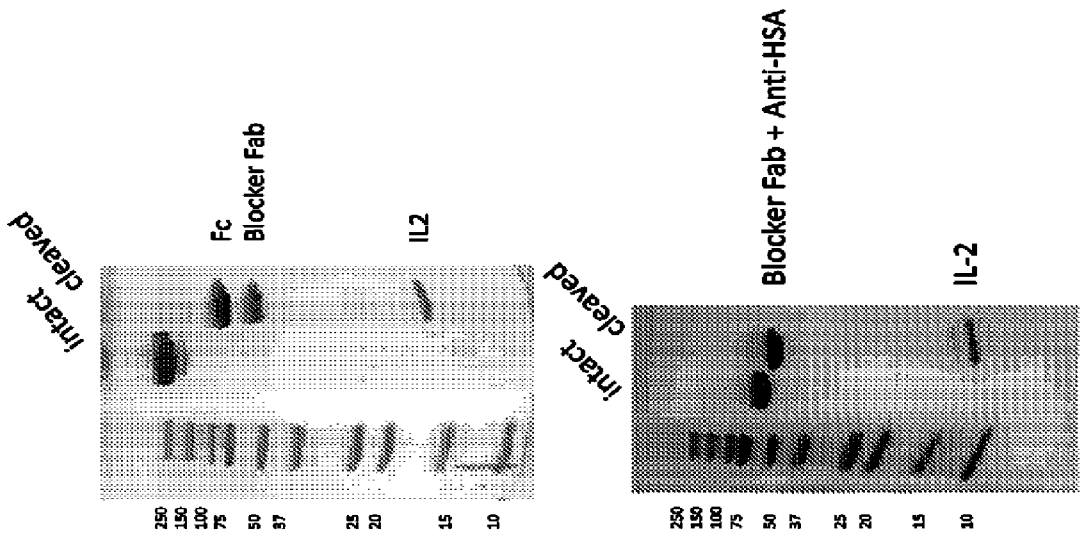

Intact
cleaved
Fc
Blocker Fab
IL2
250
150
100
75
50
37
25
20
15
10
Intact
cleaved
Blocker Fab + Anti-HSA
IL-2
250
150
100
75
50
37
25
20
15
10

FIG. 1C

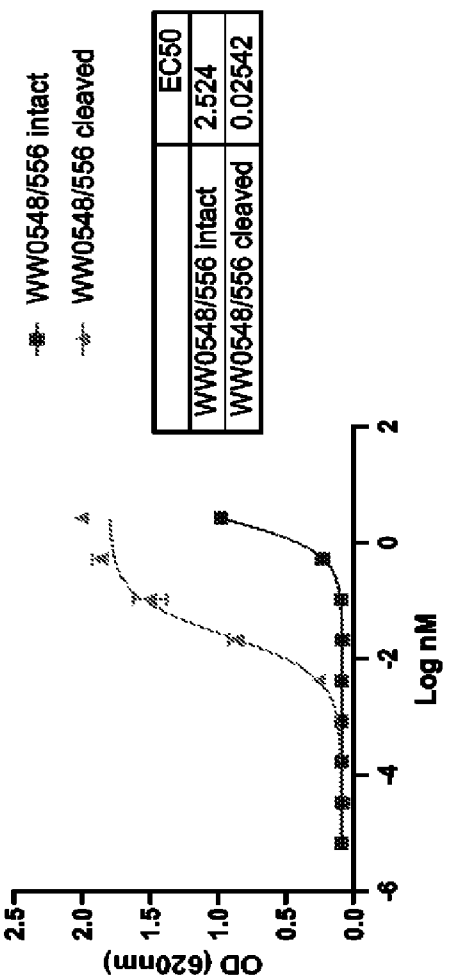
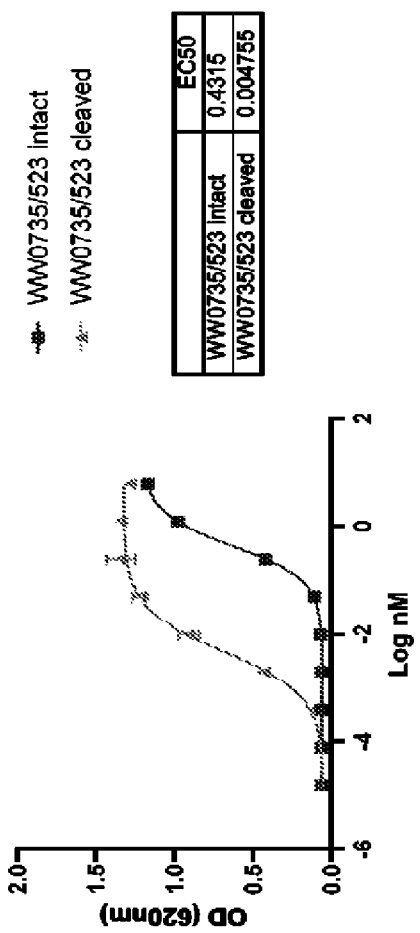

WW0548/556 intact
WW0548/556 cleaved
EC50
WW0548/556 intact 2.524
WW0548/556 cleaved 0.02542
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM

FIG. 1D


WW0735/523 intact
WW0735/523 cleaved
EC50
WW0735/523 intact 0.4315
WW0735/523 cleaved 0.0047555
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM

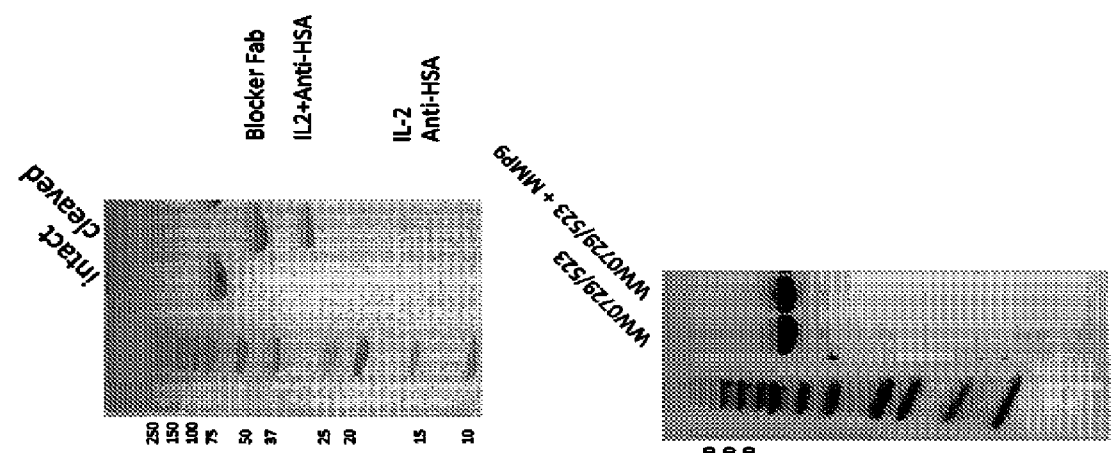
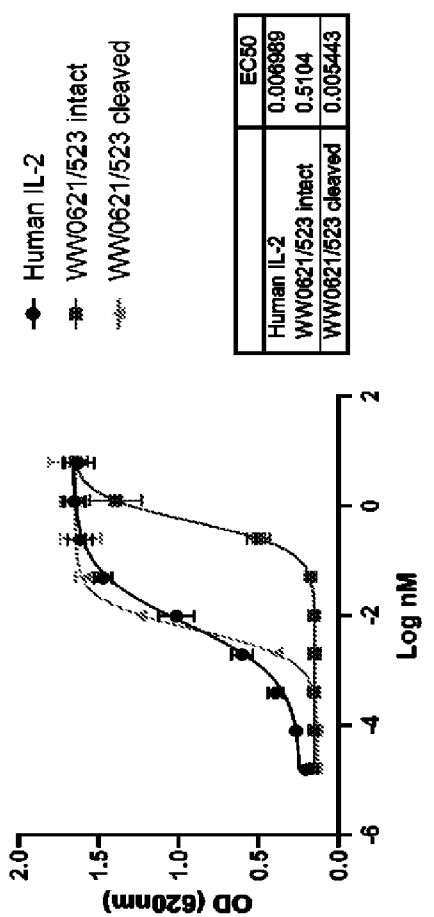
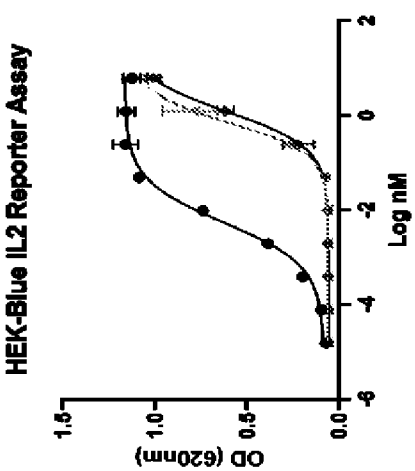


FIG. 1E



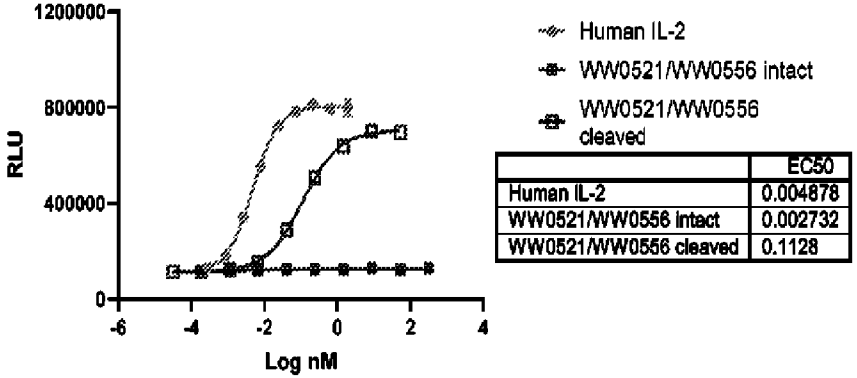
	EC50
Human IL-2	0.006989
WW0621/523 intact	0.5104
WW0621/523 cleaved	0.005443

FIG. 1F



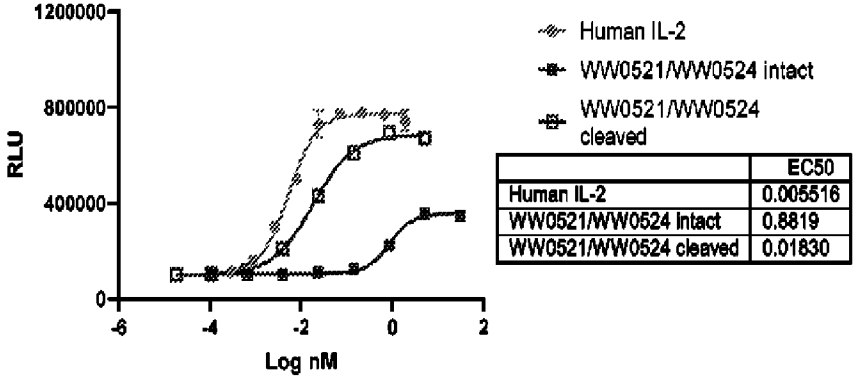
	EC50
Human IL-2	0.005379
WW0729/523	1.181
WW0729/523+MMP9	0.6798

FIG. 2A



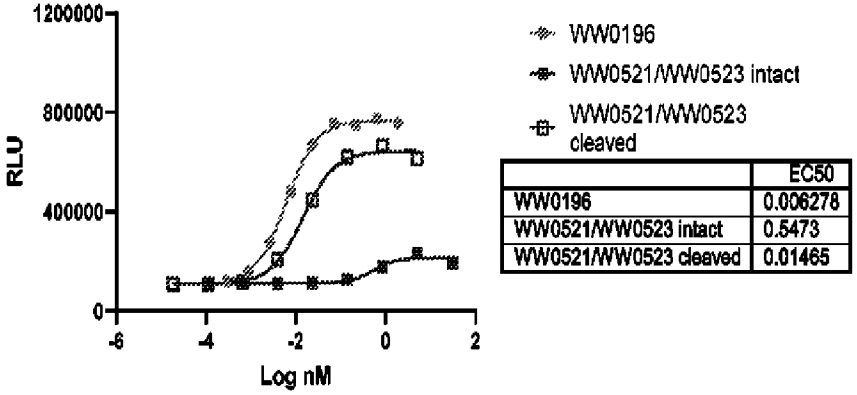
	EC50
Human IL-2	0.004878
WW0521/WW0556 intact	0.002732
WW0521/WW0556 cleaved	0.1128

FIG. 2B



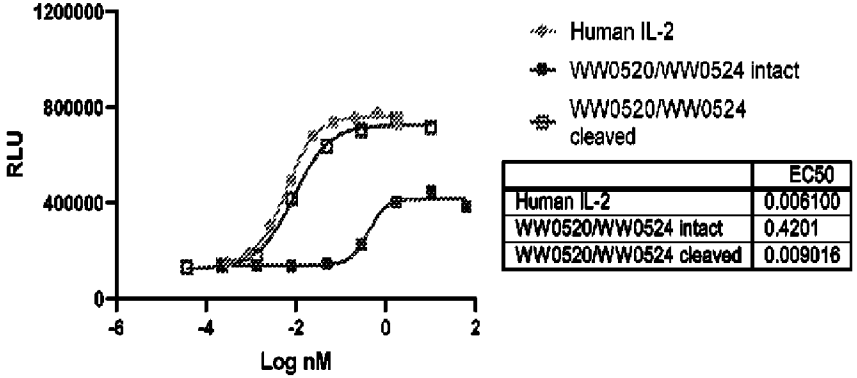
	EC50
Human IL-2	0.005516
WW0521/WW0524 intact	0.8819
WW0521/WW0524 cleaved	0.01830

FIG. 2C



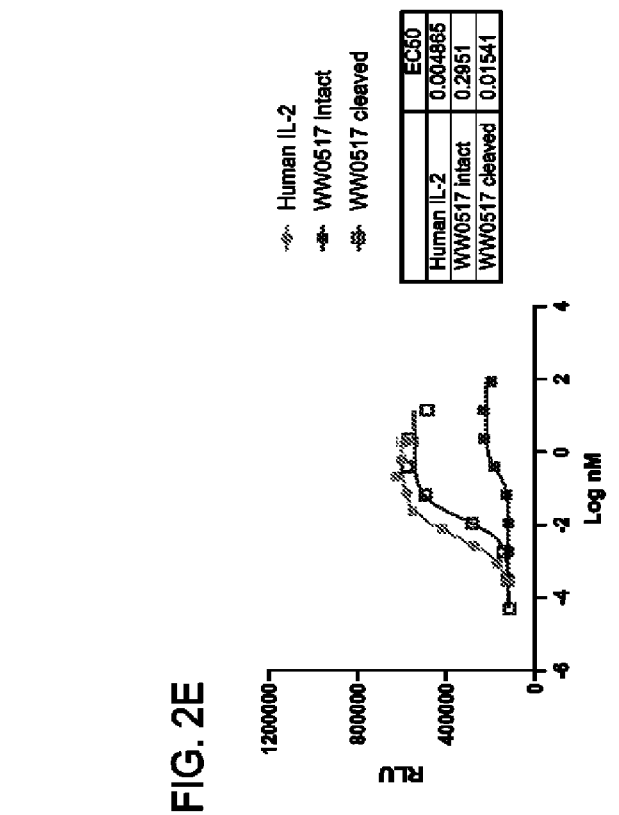
	EC50
WW0196	0.006278
WW0521/WW0523 intact	0.5473
WW0521/WW0523 cleaved	0.01465

FIG. 2D



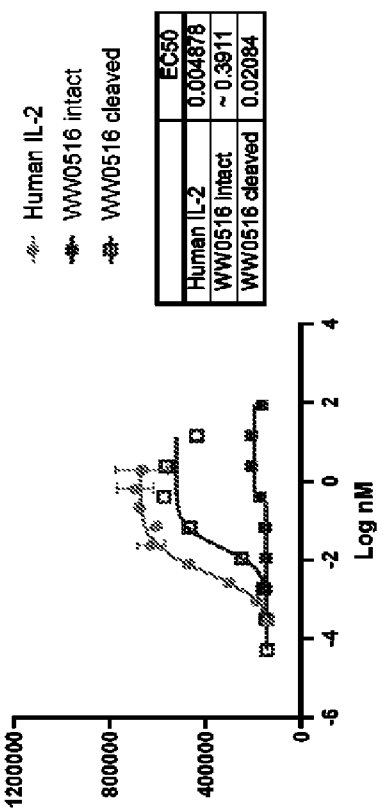
	EC50
Human IL-2	0.006100
WW0520/WW0524 intact	0.4201
WW0520/WW0524 cleaved	0.009016

FIG. 2E



	EC50
Human IL-2	0.004865
WW0517 intact	0.2951
WW0517 cleaved	0.01541

FIG. 2F



	EC50
Human IL-2	0.004878
WW0516 intact	~ 0.3911
WW0516 cleaved	0.02084

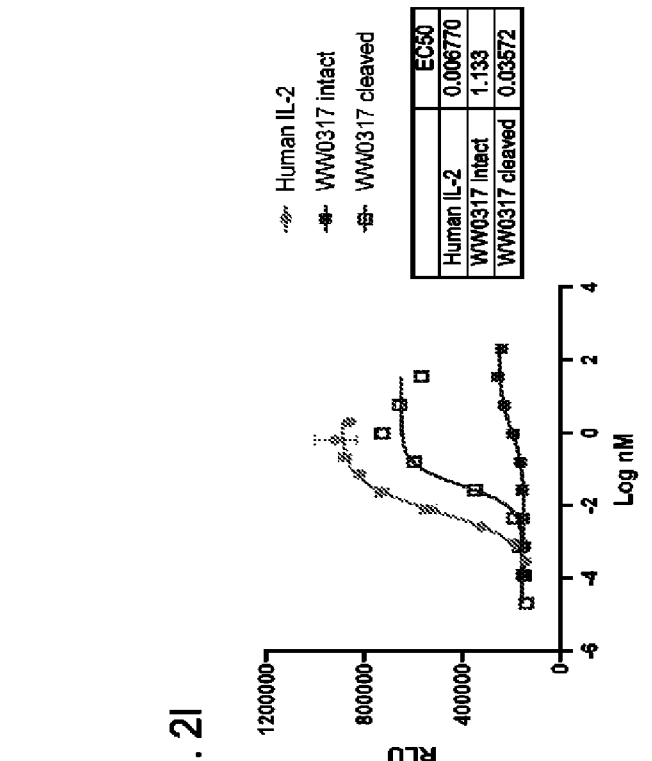
FIG. 2G

	EC50
Human IL-2	0.008347
WW0417 intact	0.4272
WW0417 cleaved	0.01609

FIG. 2H

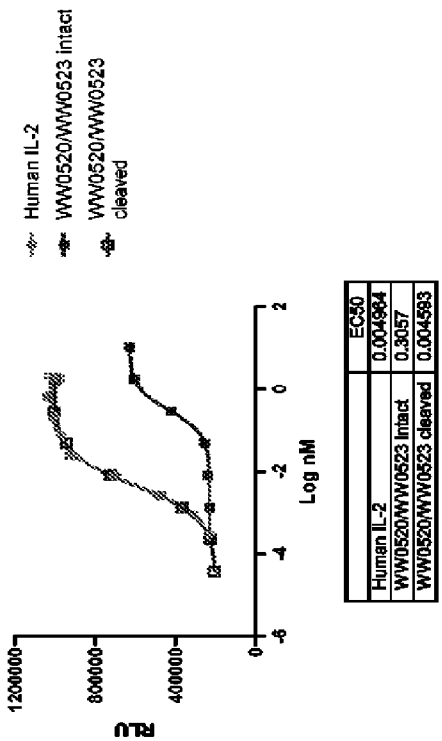
	EC50
Human IL-2	0.006770
WW0317 intact	1.133
WW0317 cleaved	0.03572

FIG. 2I



	EC50
Human IL-2	0.006770
WW0317 intact	1.133
WW0317 cleaved	0.03572

FIG. 2J

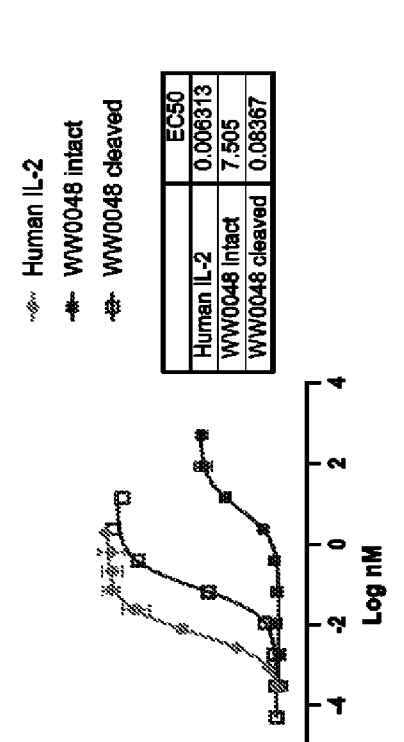


	EC50
Human IL-2	0.004984
WW0520/WW0523 intact	0.3057
WW0520/WW0523 cleaved	0.004593

FIG. 2K

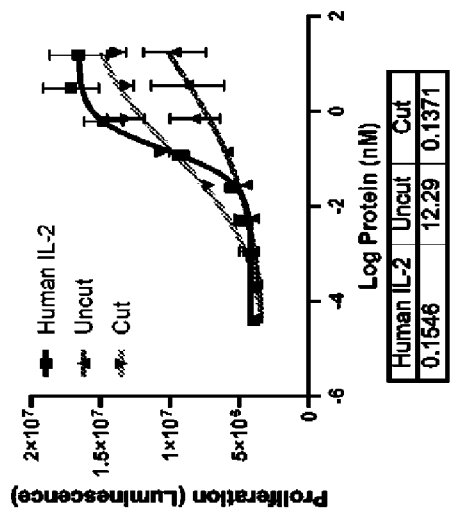
	EC50
Human IL-2	0.006014
WW0621/WW0523 intact	~ 0.2867
WW0621/WW0523 cleaved	0.01808

FIG. 2L



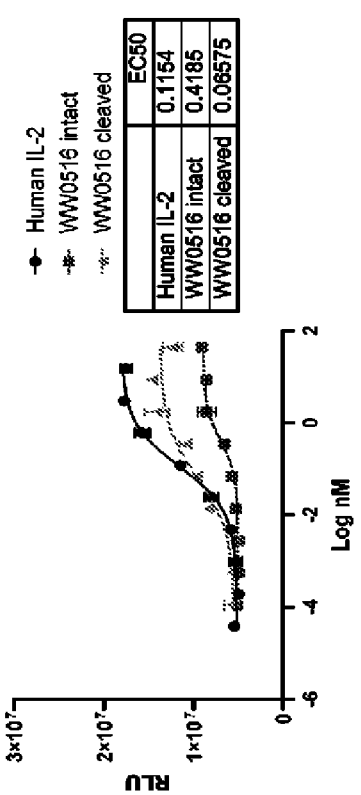
	EC50
Human IL-2	0.006313
WW0048 intact	7.505
WW0048 cleaved	0.08367

FIG. 3A



Human IL-2	Uncut	Cut
0.1546	12.29	0.1371

FIG. 3B

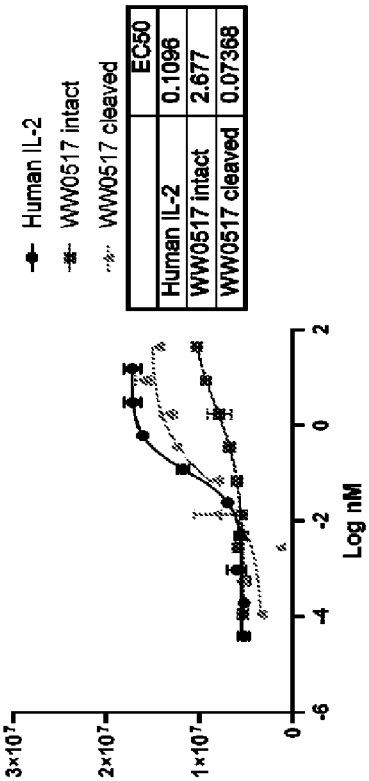


	EC50
Human IL-2	0.1154
WW0516 intact	0.4185
WW0516 cleaved	0.08575

FIG. 3C

Human IL-2	Uncut	Cut
0.1285	15.43	0.1765

FIG. 3D



	EC50
Human IL-2	0.1096
WW0517 intact	2.677
WW0517 cleaved	0.07368

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FIG. 3E

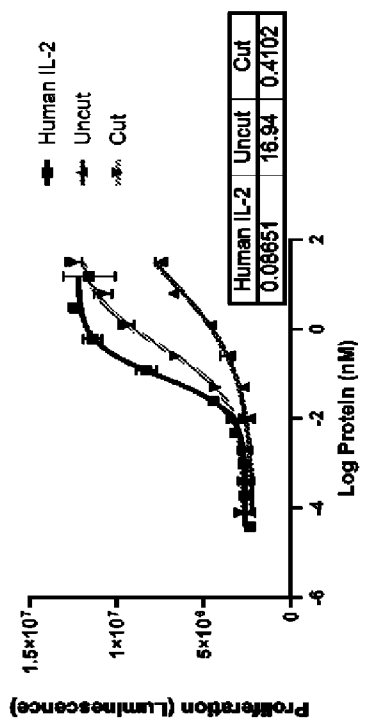


FIG. 3F

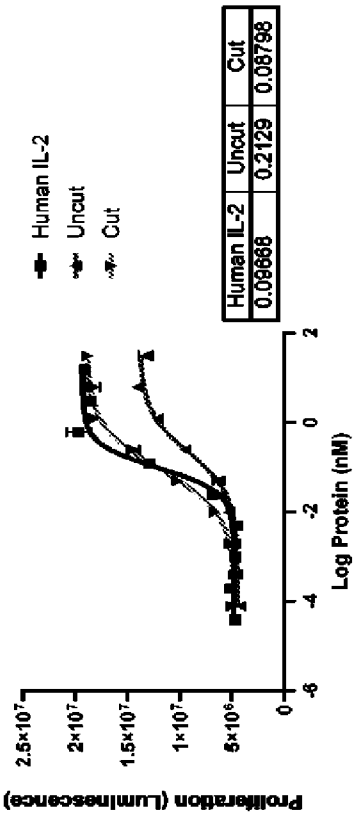


FIG. 3G

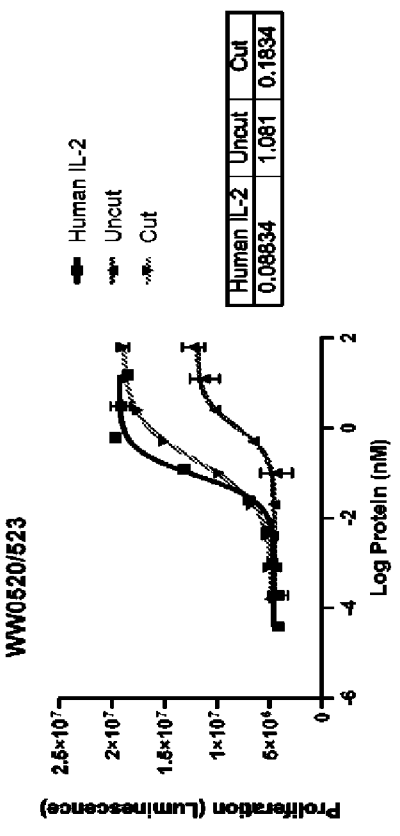
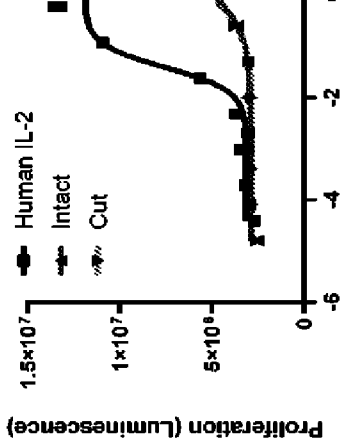
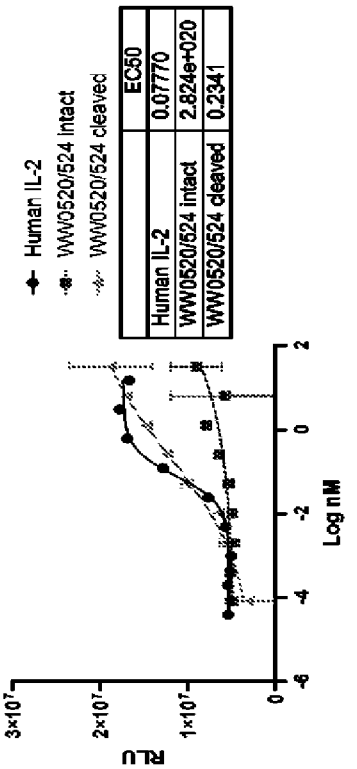


FIG. 3H



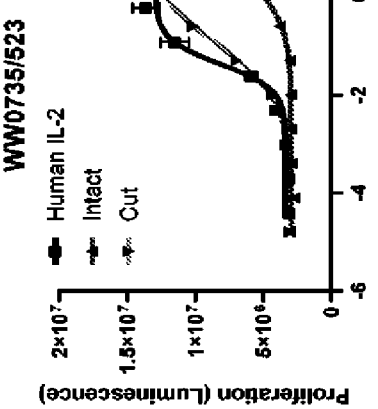
	Human IL-2	Intact	Cut
IC50	0.03912	1.290	0.4793

FIG. 3J



	EC50
Human IL-2	0.07770
WW0520/524 intact	2.824e+020
WW0520/524 cleaved	0.2341

FIG. 3I



	Human IL-2	Intact	Cut
IC50	0.04292	1.983	0.1162

FIG. 4A

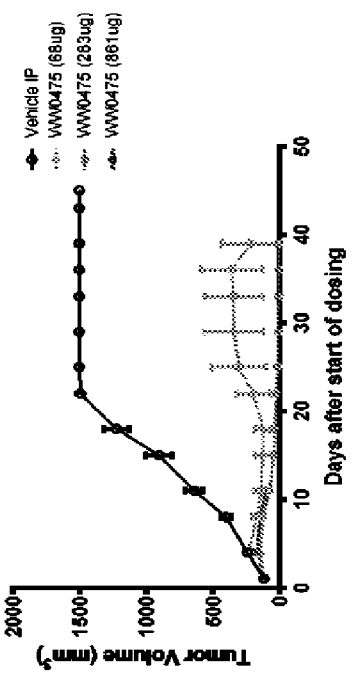


FIG. 4B

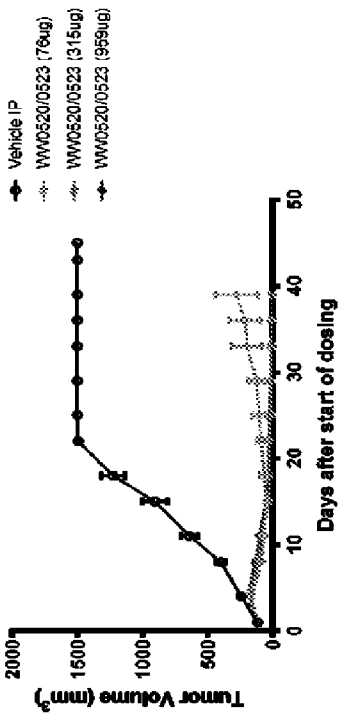


FIG. 4C

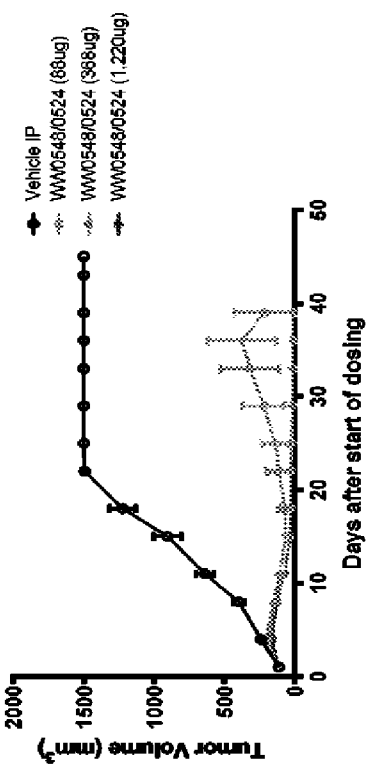


FIG. 4D

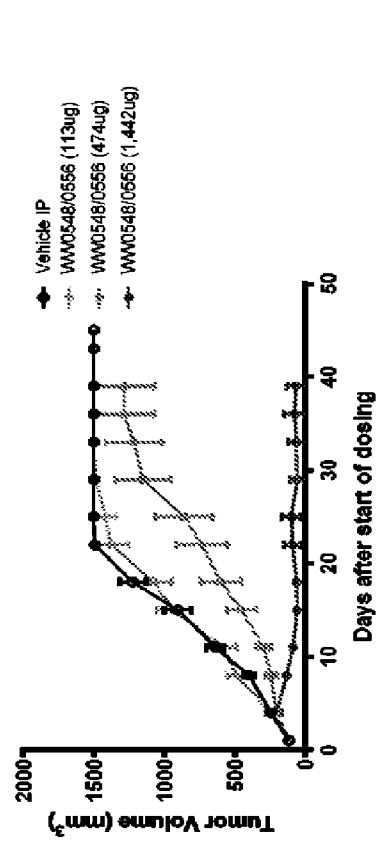
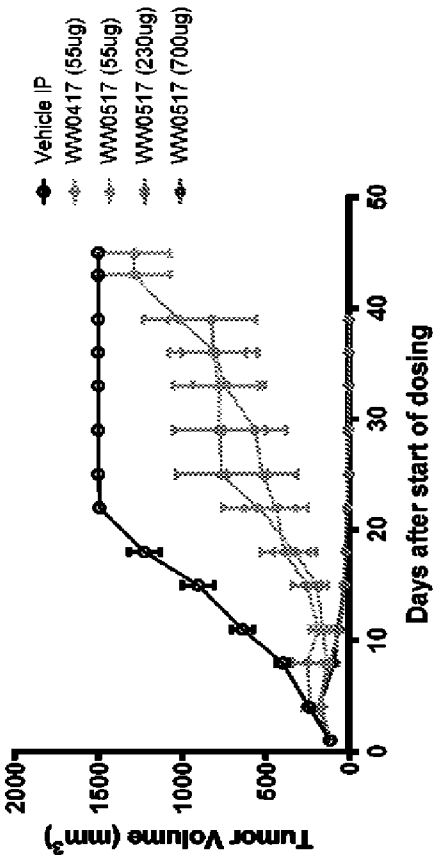

WW0548/0556
Vehicle IP
WW0548/0556 (113ug)
WW0548/0556 (474ug)
WW0548/0556 (1,442ug)
Tumor Volume (mm3)
2000
1500
1000
500
0
0
10
20
30
40
50
Days after start of dosing

FIG. 4E


WW0517
Vehicle IP
WW0417 (55ug)
WW0517 (55ug)
WW0517 (230ug)
WW0517 (700ug)
Tumor Volume (mm3)
2000
1500
1000
500
0
0
10
20
30
40
50
Days after start of dosing

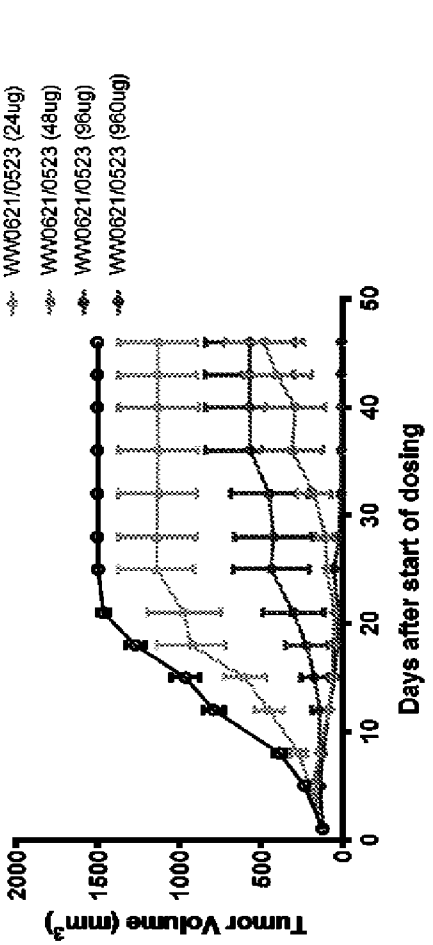

WW0621/0523
Vehicle IP
WW0621/0523 (24ug)
WW0621/0523 (48ug)
WW0621/0523 (96ug)
WW0621/0523 (960ug)
Tumor Volume (mm3)
2000
1500
1000
500
0
0
10
20
30
40
50
Days after start of dosing

FIG. 4F

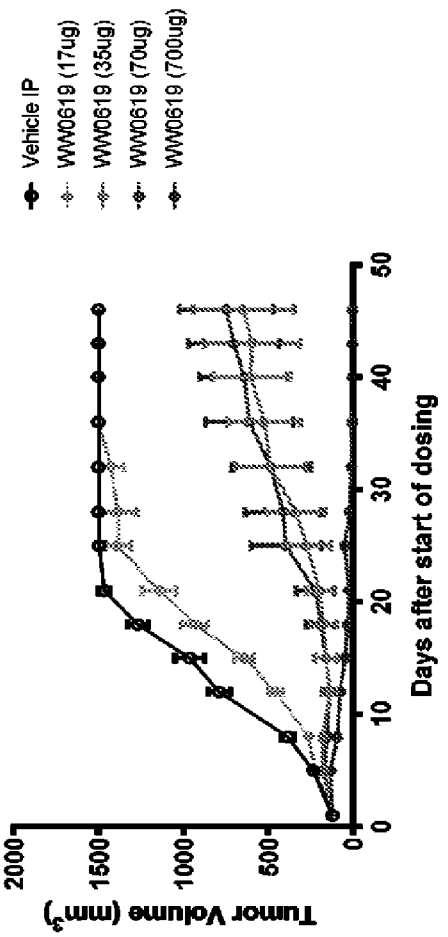

WW0619
Vehicle IP
WW0619 (17ug)
WW0619 (35ug)
WW0619 (70ug)
WW0619 (700ug)
Tumor Volume (mm3)
2000
1500
1000
500
0
0
10
20
30
40
50
Days after start of dosing

FIG. 4G

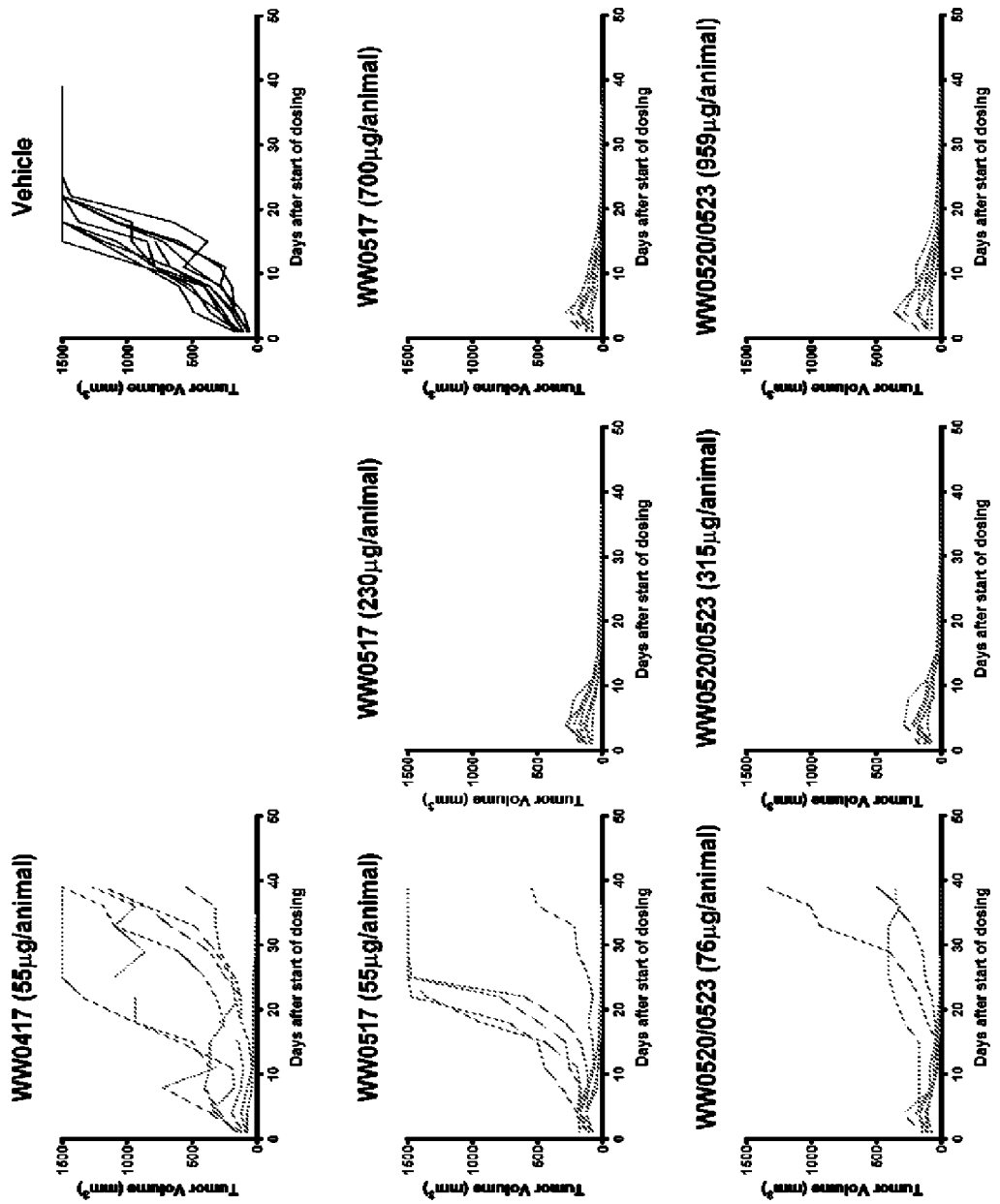

Vehicle
WW0417 (55µg/animal)
WW0517 (55µg/animal)
WW0517 (230µg/animal)
WW0517 (700µg/animal)
WW0520/0523 (76µg/animal)
WW0520/0523 (315µg/animal)
WW0520/0523 (959µg/animal)
Tumor Volume (mm³)
Days after start of dosing

FIG. 5A

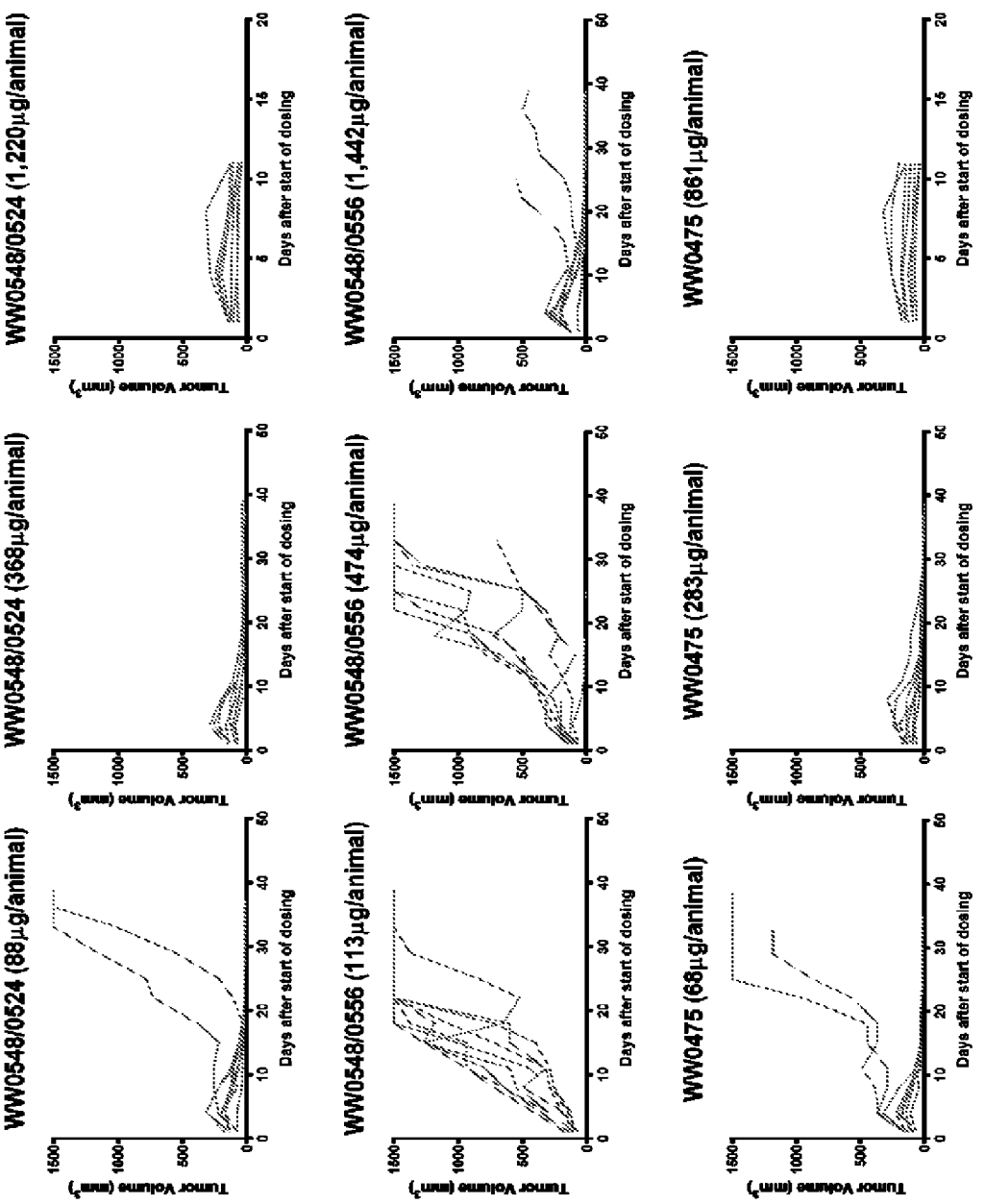
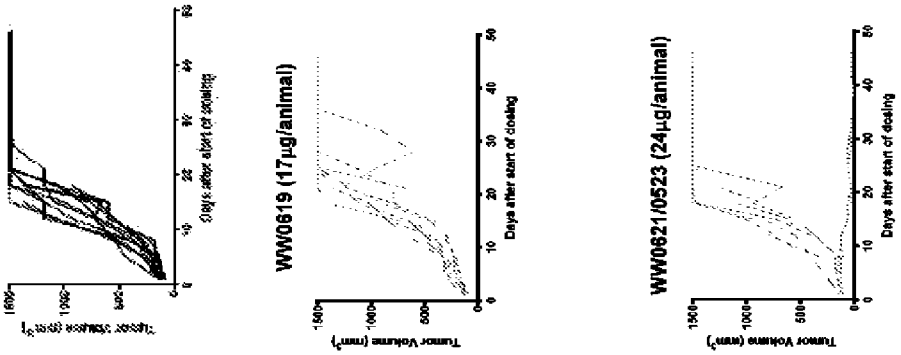

WW0548/0524 (88µg/animal)
WW0548/0524 (368µg/animal)
WW0548/0524 (1,220µg/animal)
WW0548/0556 (113µg/animal)
WW0548/0556 (474µg/animal)
WW0548/0556 (1,442µg/animal)
WW0475 (68µg/animal)
WW0475 (283µg/animal)
WW0475 (861µg/animal)
Tumor Volume (mm³)
Days after start of dosing

FIG. 5B

FIG. 5C


Vehicle
WW0619 (17µg/animal)
WW0619 (35µg/animal)
WW0619 (70µg/animal)
WW0619 (700µg/animal)
WW0621/0523 (24µg/animal)
WW0621/0523 (48µg/animal)
WW0621/0523 (96µg/animal)
WW0621/0523 (960µg/animal)
Tumor Volume (mm³)
Days after start of dosing

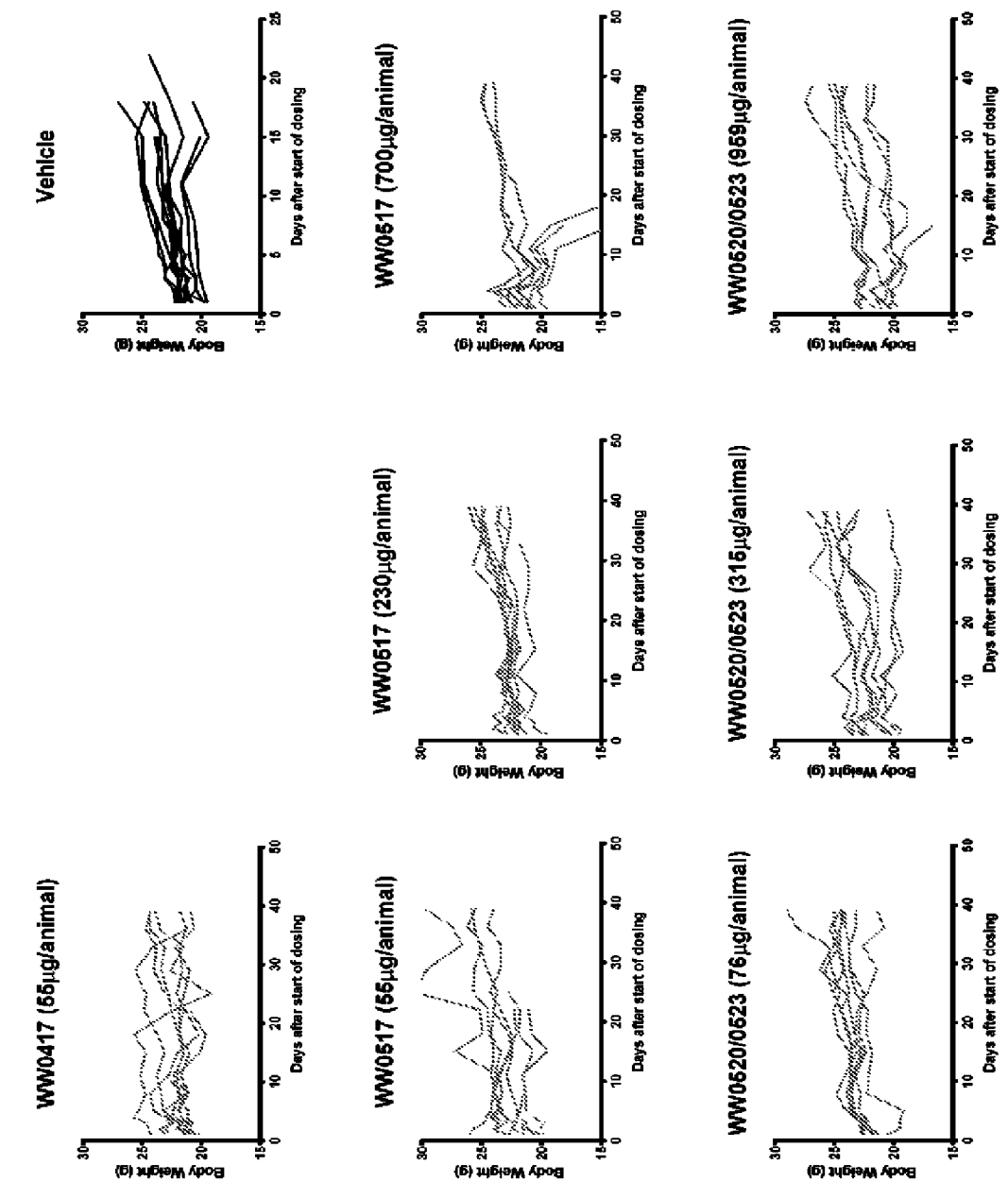

Vehicle
WW0417 (55µg/animal)
WW0517 (55µg/animal)
WW0517 (230µg/animal)
WW0517 (700µg/animal)
WW0620/0623 (76µg/animal)
WW0620/0623 (315µg/animal)
WW0620/0623 (959µg/animal)
Body Weight (g)
Days after start of dosing

FIG. 6A

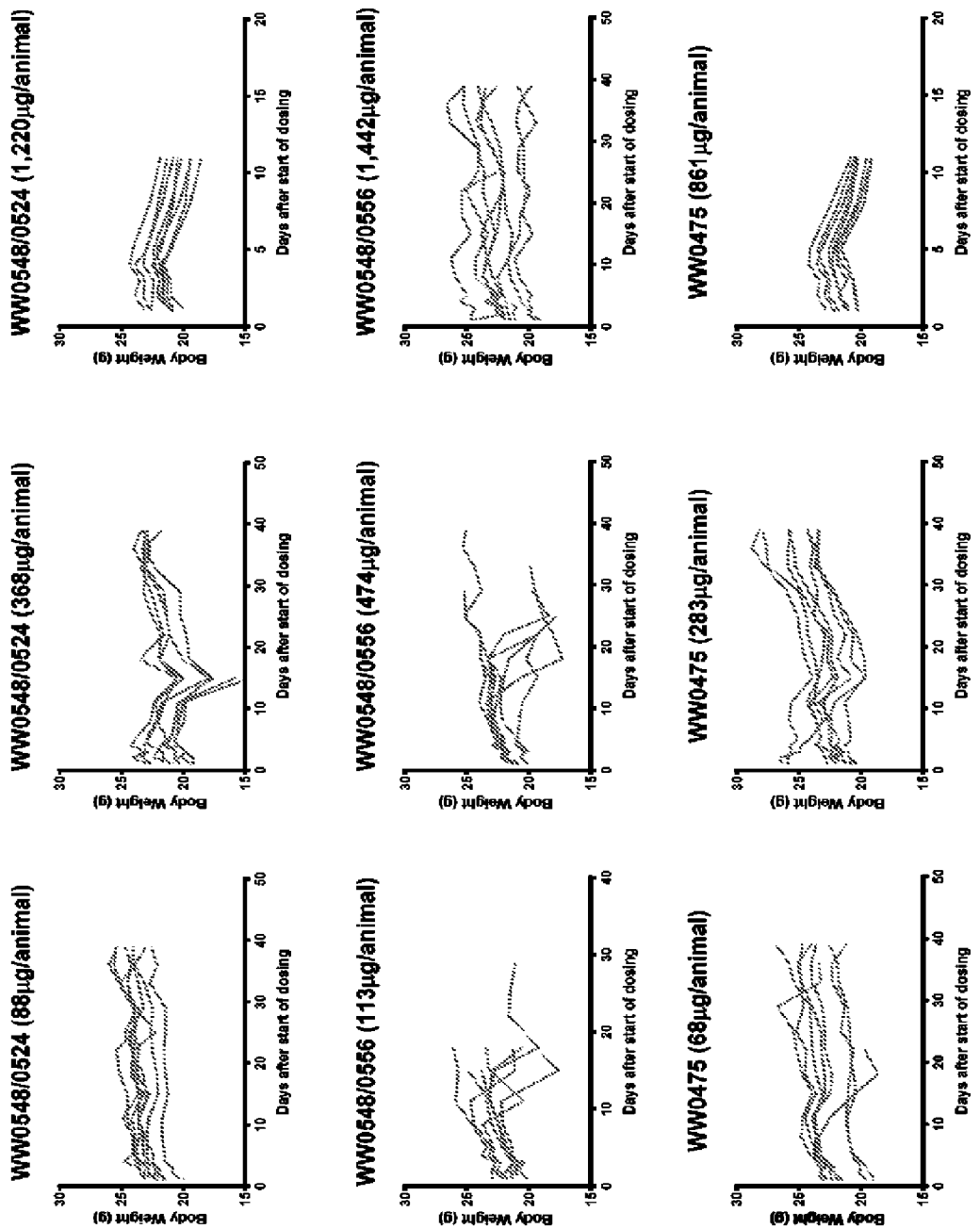

WW0548/0524 (88µg/animal)
WW0548/0524 (368µg/animal)
WW0548/0524 (1,220µg/animal)
WW0548/0556 (113µg/animal)
WW0548/0556 (474µg/animal)
WW0548/0556 (1,442µg/animal)
WW0475 (68µg/animal)
WW0475 (283µg/animal)
WW0475 (861µg/animal)
Body Weight (g)
Days after start of dosing

FIG. 6B

FIG. 6C

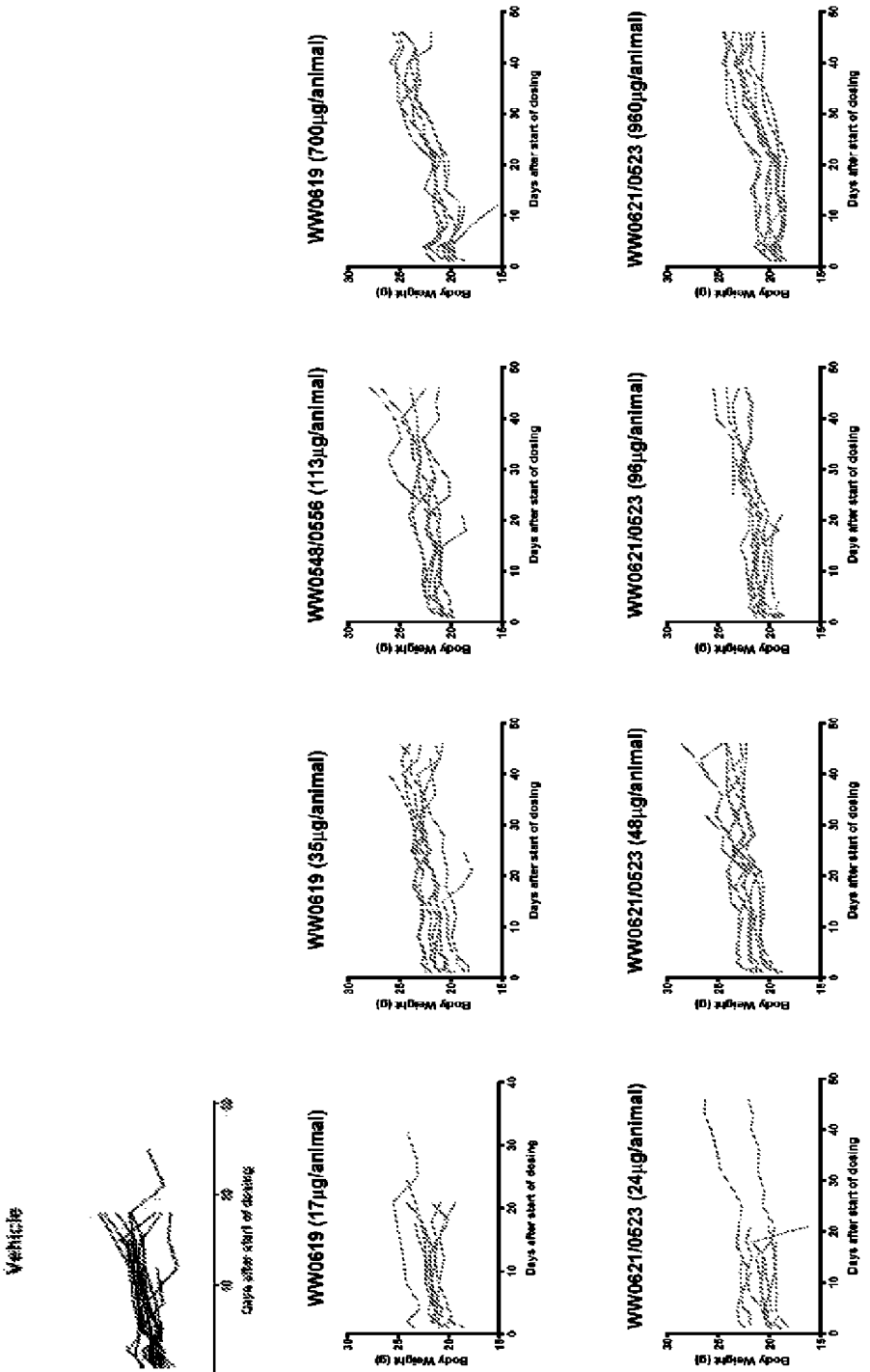
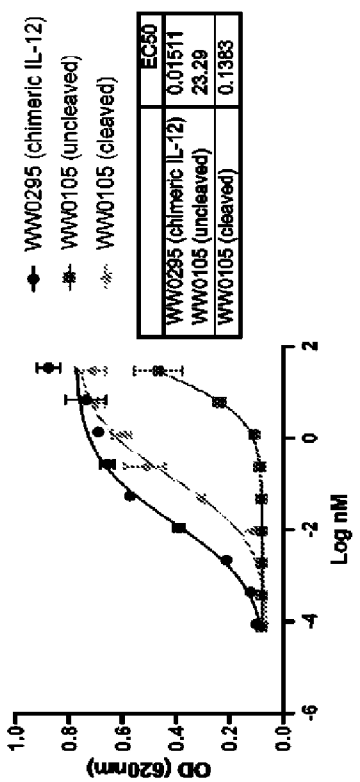
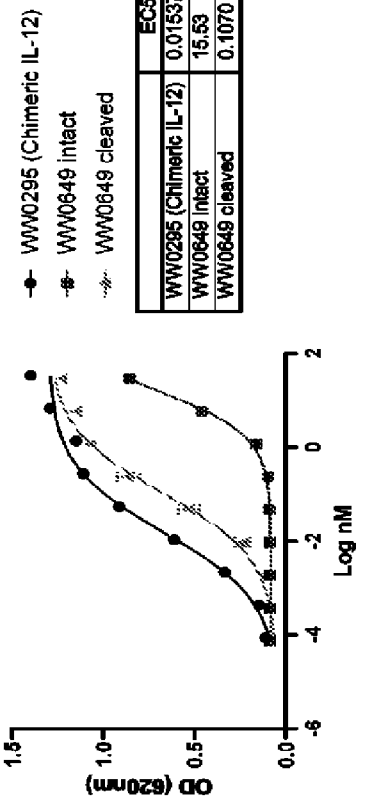

Vehicle
WW0619 (700µg/animal)
WW0548/0556 (113µg/animal)
WW0619 (35µg/animal)
WW0621/0523 (960µg/animal)
WW0621/0523 (96µg/animal)
WW0621/0523 (48µg/animal)
WW0619 (17µg/animal)
WW0621/0523 (24µg/animal)
Body Weight (g)
Days after start of dosing

FIG. 7A



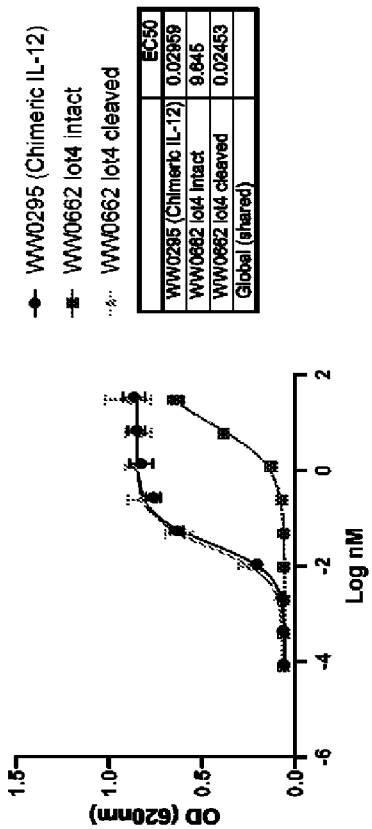
	EC50
WW0295 (chimeric IL-12)	0.01511
WW0105 (uncleaved)	23.29
WW0105 (cleaved)	0.1383

FIG. 7B



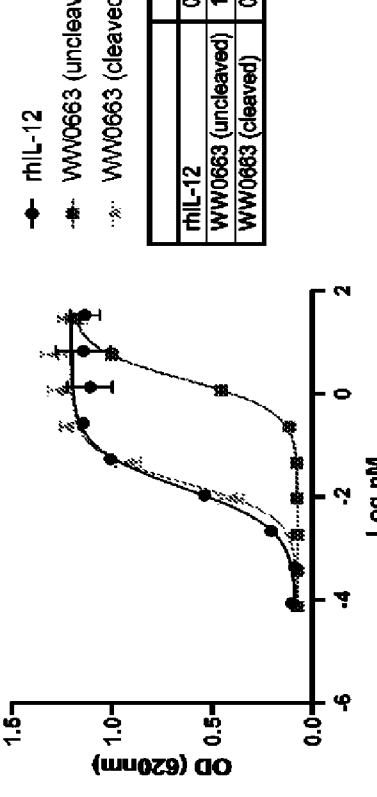
	EC50
WW0295 (Chimeric IL-12)	0.01537
WW0649 intact	15.53
WW0649 cleaved	0.1070

FIG. 7C



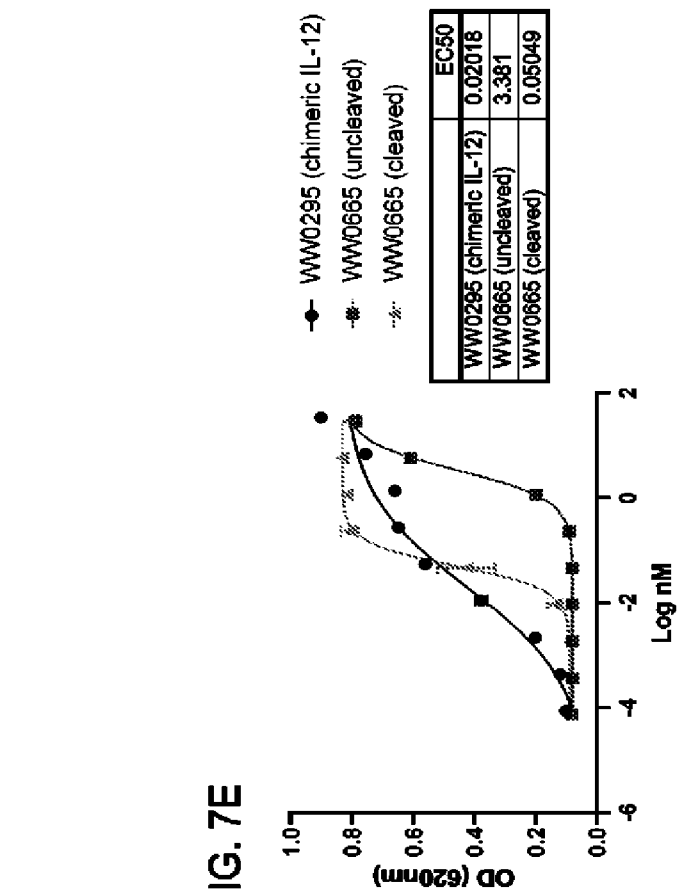
	EC50
WW0295 (Chimeric IL-12)	0.02859
WW0662 lot4 intact	9.845
WW0662 lot4 cleaved	0.02453
Global (shared)	

FIG. 7D



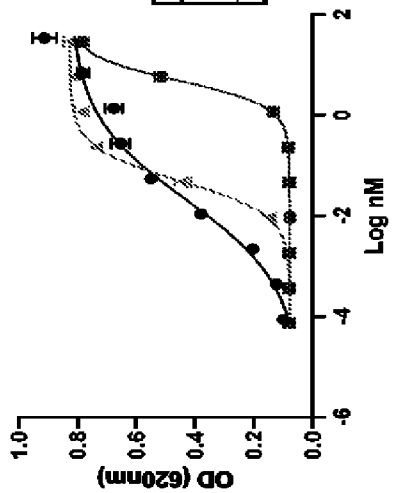
	EC50
rhIL-12	0.01487
WW0663 (uncleaved)	1.907
WW0663 (cleaved)	0.01881

FIG. 7E



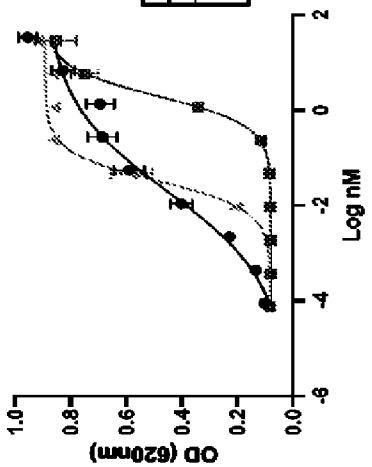
	EC50
WW0295 (chimeric IL-12)	0.02018
WW0665 (uncleaved)	3.381
WW0665 (cleaved)	0.05049

FIG. 7F



	EC50
WW0295 (chimeric IL-12)	0.02130
WW0667 (uncleaved)	4.805
WW0667 (cleaved)	0.04966

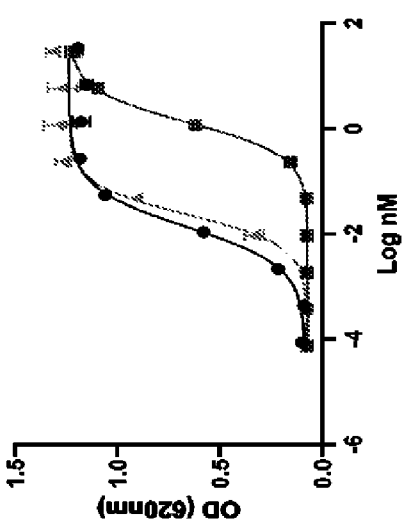
FIG. 7G



	EC50
WW0295 (chimeric IL-12)	0.02001
WW0669 (uncleaved)	1.983
WW0669 (cleaved)	0.03294

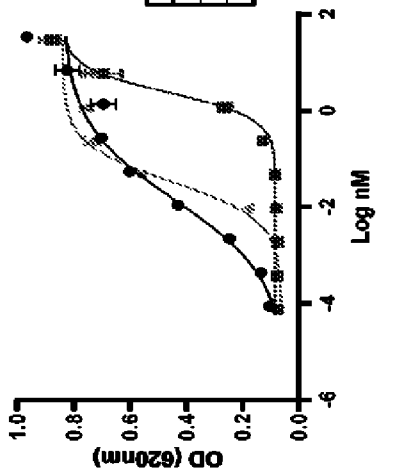
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FIG. 7H



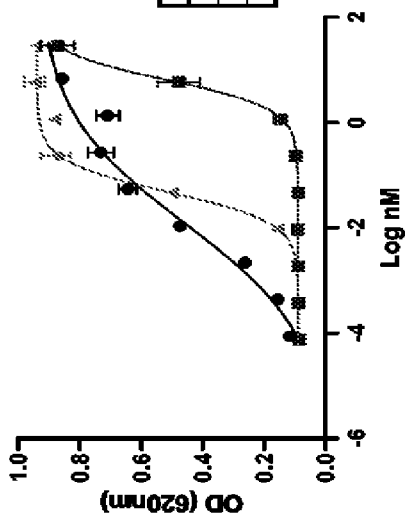
	EC50
rhIL-12	0.01355
WW0671 (uncleaved)	1.303
WW0671 (cleaved)	0.02322

FIG. 7I



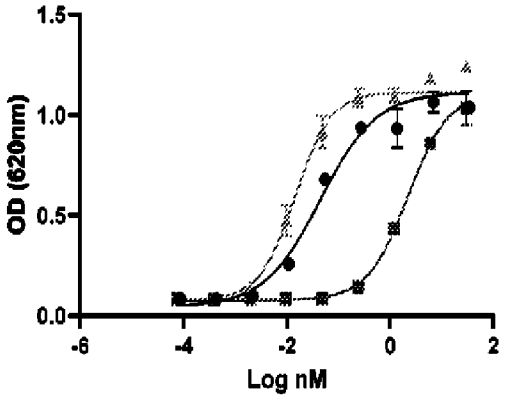
	EC50
WW0295 (chimeric IL-12)	0.01383
WW0673 (uncleaved)	2.355
WW0673 (cleaved)	0.03338

FIG. 7J



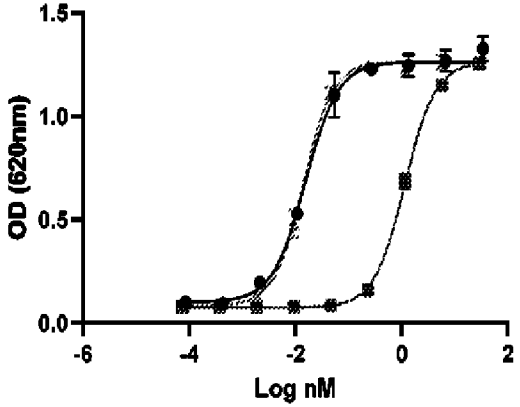
	EC50
WW0295 (chimeric IL-12)	0.01240
WW0675 (uncleaved)	8.451
WW0675 (cleaved)	0.04843

FIG. 7K



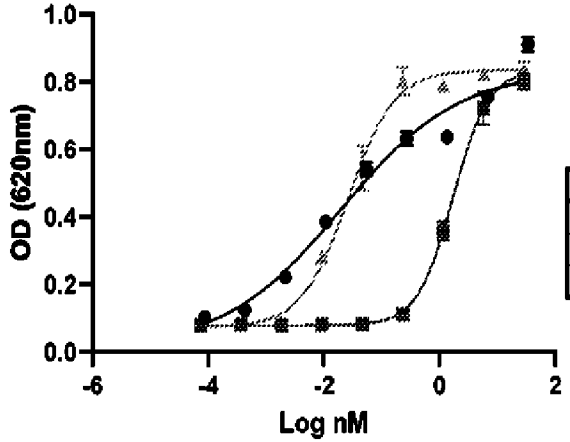
	EC50
WW0295 (Chimeric IL-12)	0.04489
WW0670 lot1 intact	2.218
WW0670 lot1 cleaved	0.01457

FIG. 7L



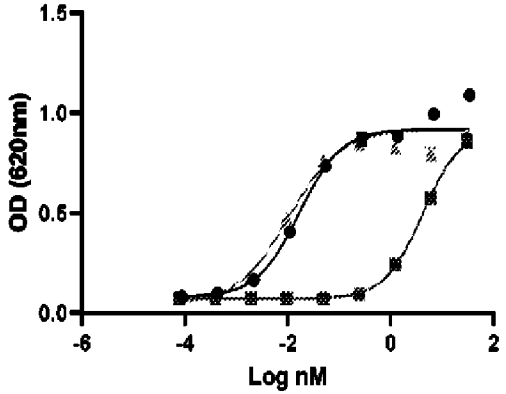
	EC50
rhIL-12	0.01552
WW0677 (uncleaved)	1.148
WW0677 (cleaved)	0.01426

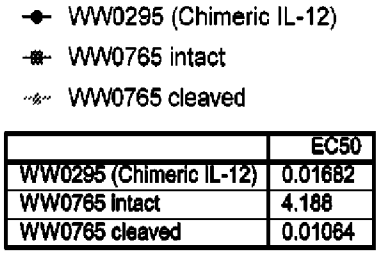
FIG. 7M



	EC50
WW0295 (chimeric IL-12)	0.02002
WW0679 (uncleaved)	1.719
WW0679 (cleaved)	0.02653

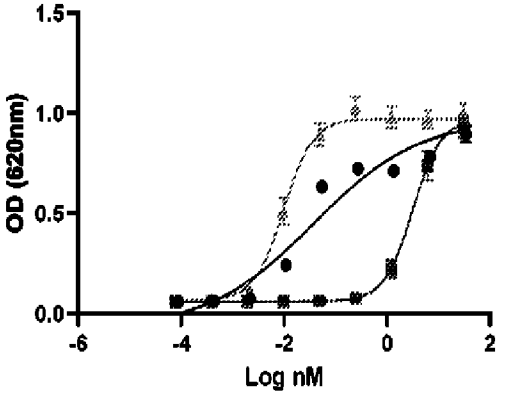
FIG. 7N

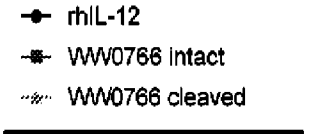




	EC50
WW0295 (Chimeric IL-12)	0.01682
WW0765 intact	4.188
WW0765 cleaved	0.01064

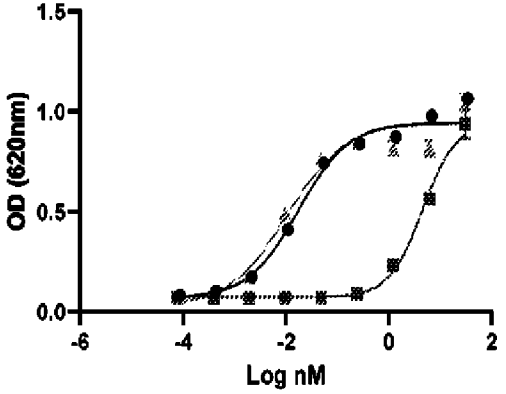
FIG. 7O

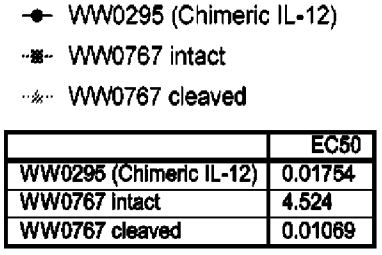




	EC50
rhIL-12	0.03712
WW0766 intact	3.167
WW0766 cleaved	0.009869

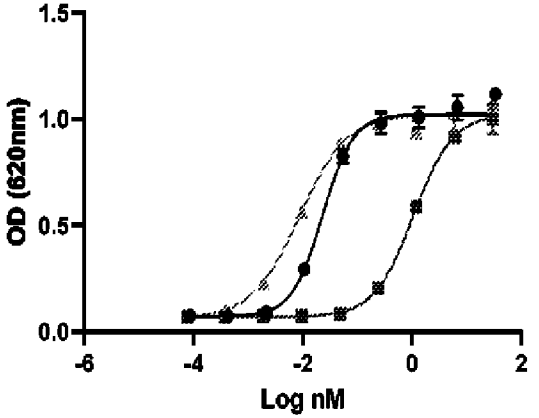
FIG. 7P

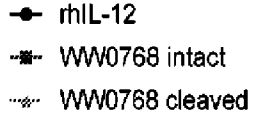




	EC50
WW0295 (Chimeric IL-12)	0.01754
WW0767 intact	4.524
WW0767 cleaved	0.01069

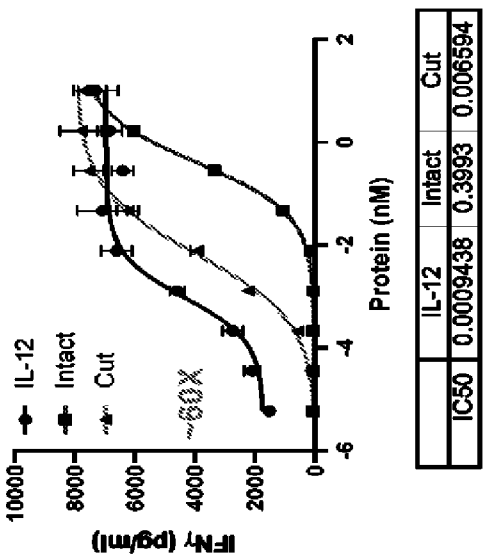
FIG. 7Q





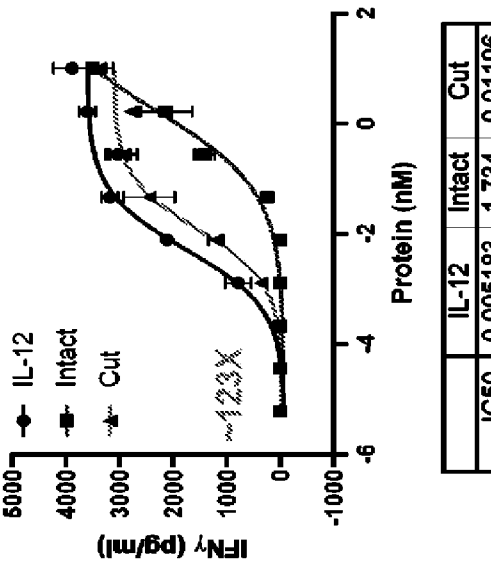
	EC50
rhIL-12	0.02326
WW0768 intact	1.069
WW0768 cleaved	0.008807

FIG. 8A



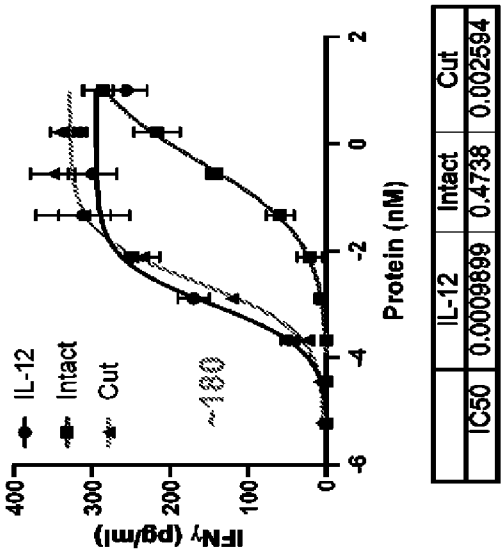
	IL-12	Intact	Cut
IC50	0.0009438	0.3993	0.006594

FIG. 8B



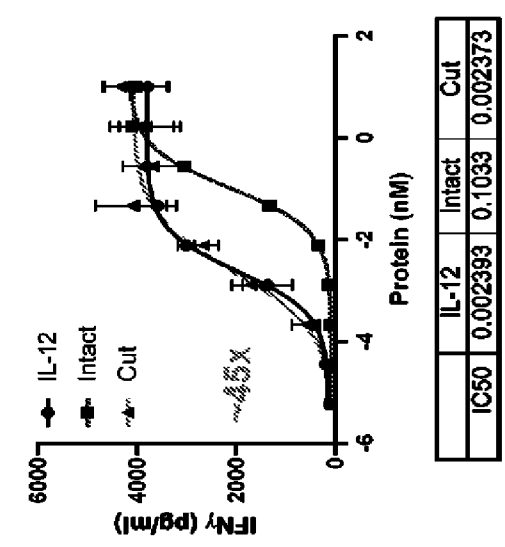
	IL-12	Intact	Cut
IC50	0.005183	1.734	0.01196

FIG. 8C



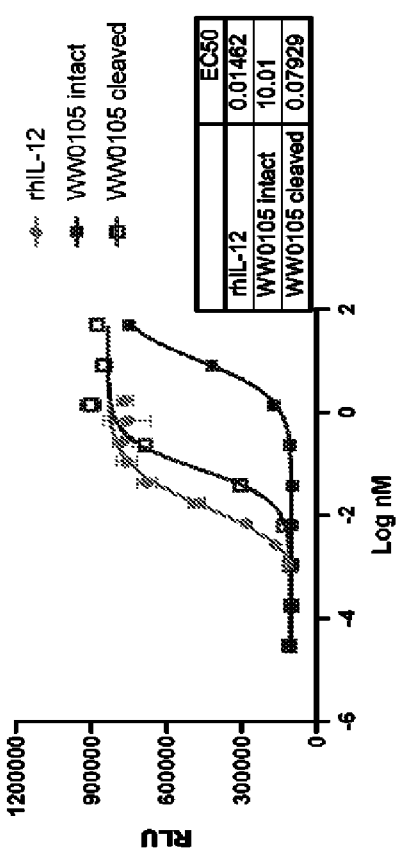
	IL-12	Intact	Cut
IC50	0.0009899	0.4738	0.002584

FIG. 8D



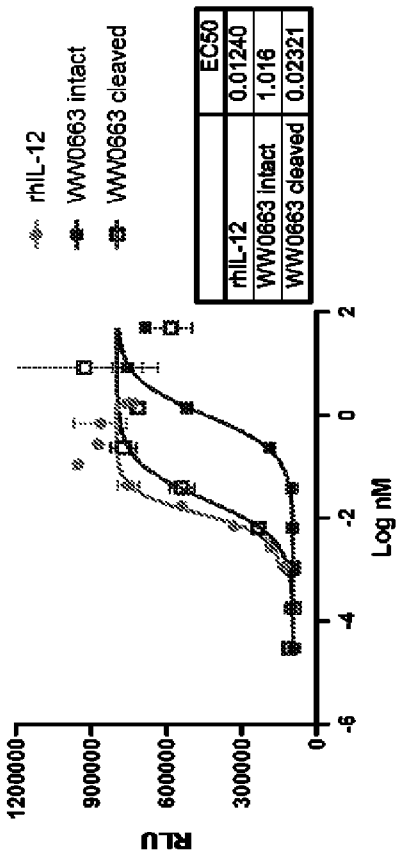
	IL-12	Intact	Cut
IC50	0.002393	0.1033	0.002373

FIG. 9A



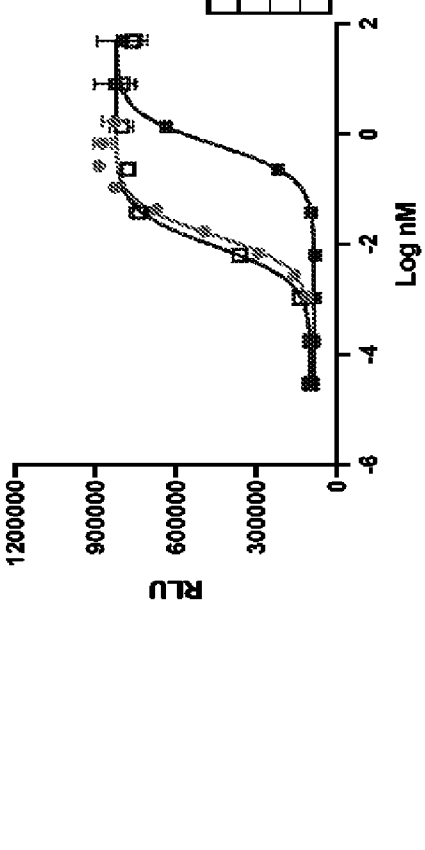
	EC50
rhIL-12	0.01462
WW0105 intact	10.01
WW0105 cleaved	0.07929

FIG. 9B

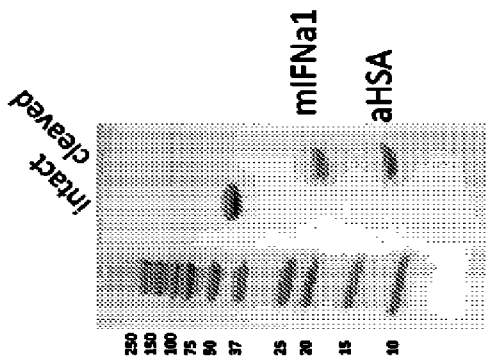


	EC50
rhIL-12	0.01240
WW0663 intact	1.016
WW0663 cleaved	0.02321

FIG. 9C



	EC50
rhIL-12	0.01504
WW0671 intact	0.6527
WW0671 cleaved	0.009547



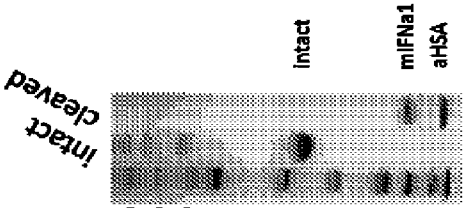
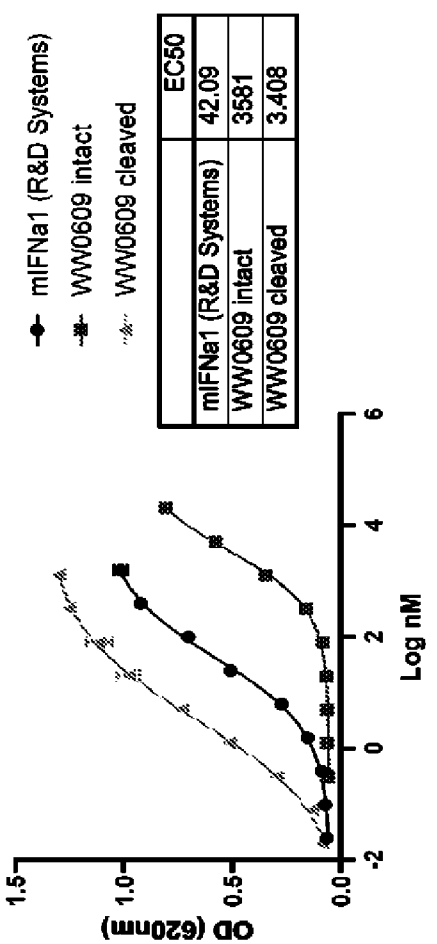
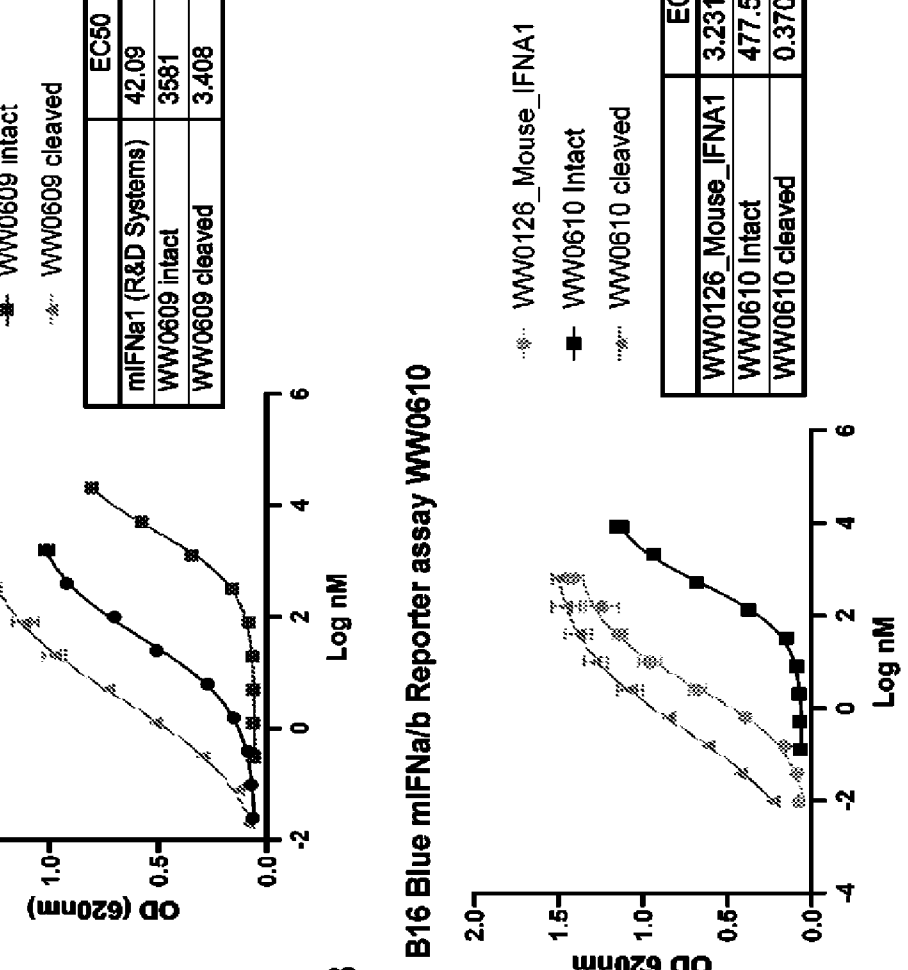


FIG. 10A

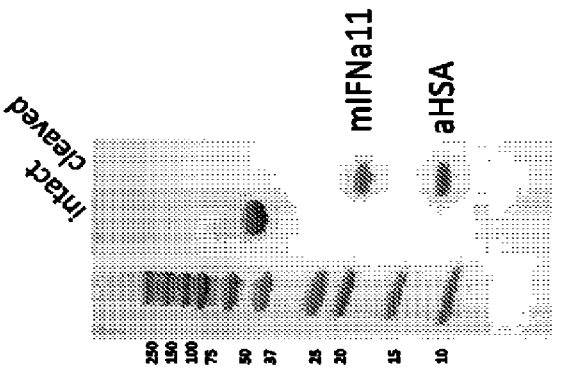


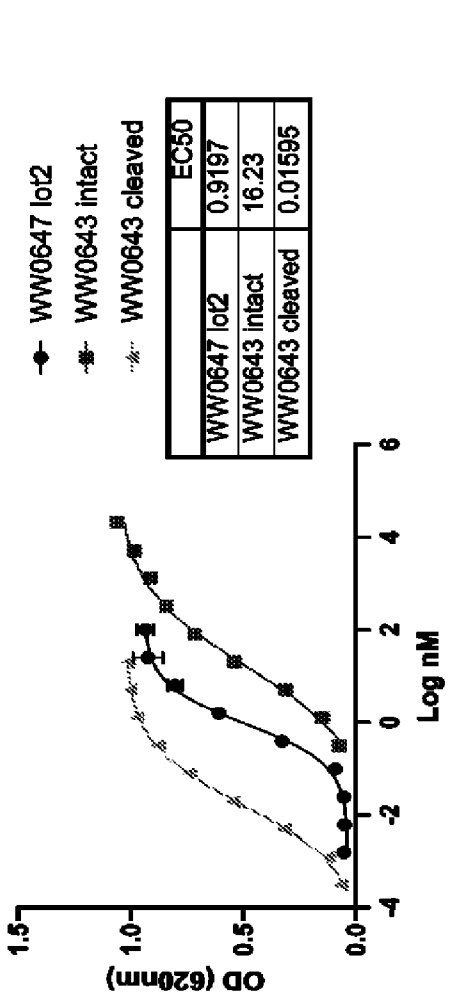
	EC50
mIFNa1 (R&D Systems)	42.09
WW0609 intact	3581
WW0609 cleaved	3.408

FIG. 10B



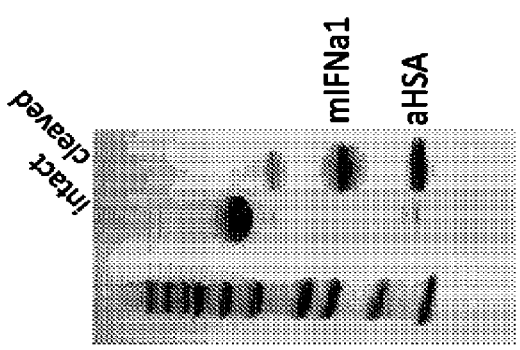
	EC50
WW0126_Mouse_IFNA1	3.231
WW0610 Intact	477.5
WW0610 cleaved	0.3708

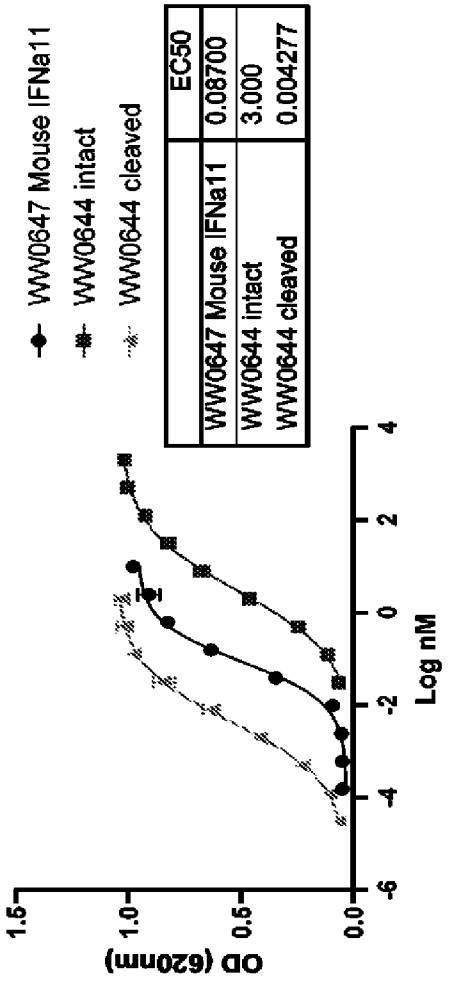




	EC50
WW0647 lot2	0.9197
WW0643 intact	16.23
WW0643 cleaved	0.01595

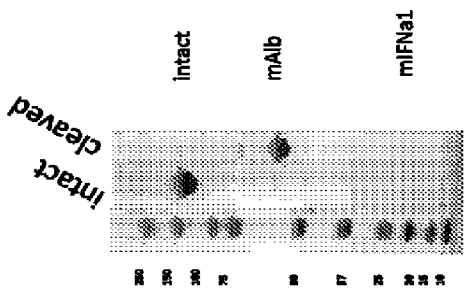
FIG. 10C





	EC50
WW0647 Mouse IFNa11	0.08700
WW0644 intact	3.000
WW0644 cleaved	0.004277

FIG. 10D



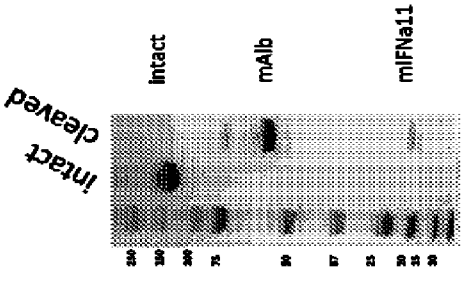
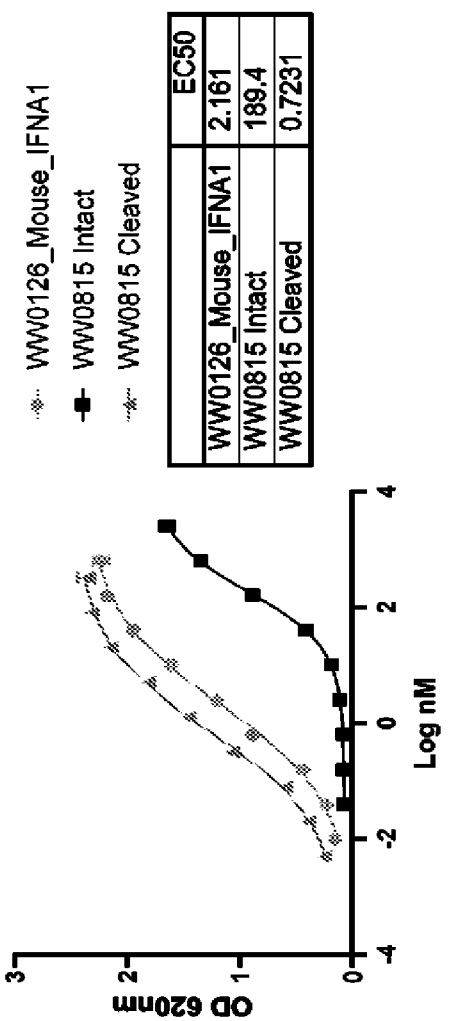
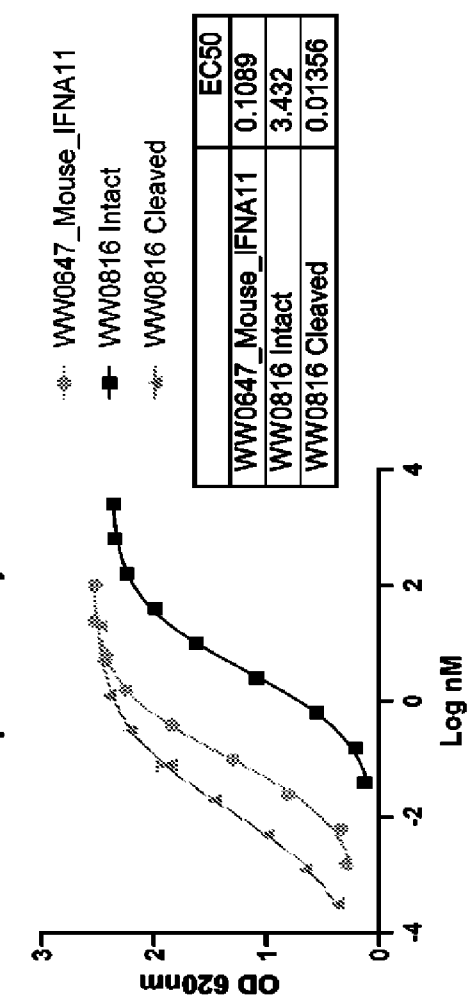


FIG. 10E

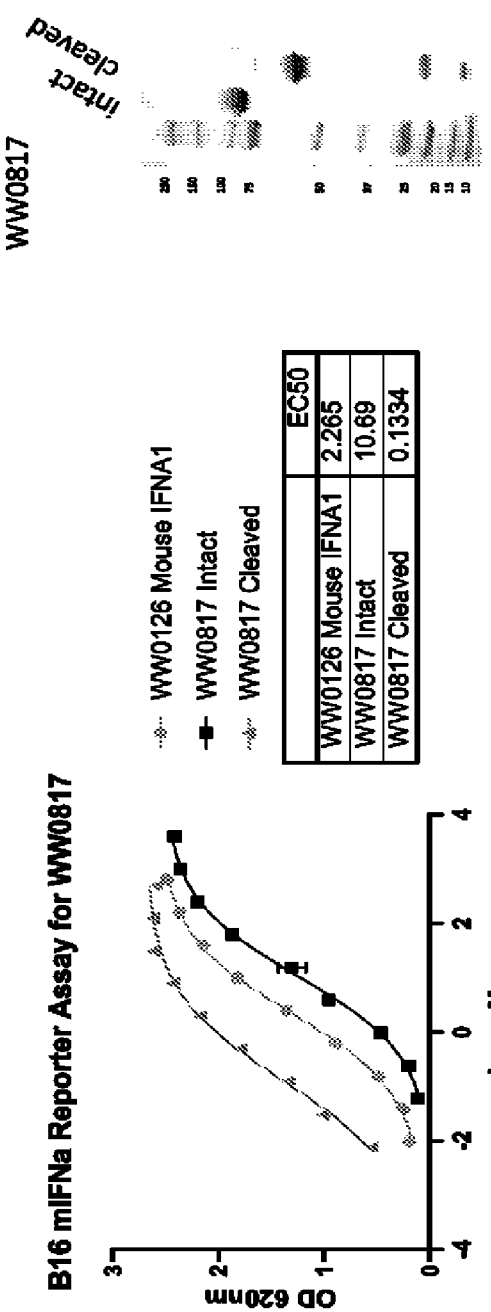


	EC50
WW0126_Mouse_IFNA1	2.161
WW0815 Intact	189.4
WW0815 Cleaved	0.7231

FIG. 10F

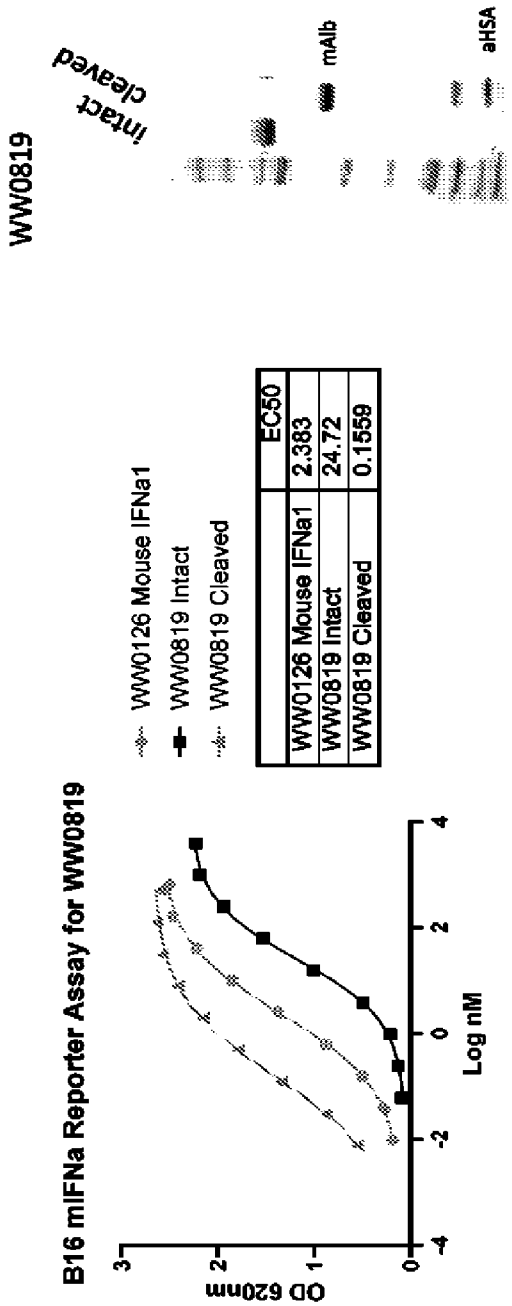


	EC50
WW0647_Mouse_IFNA11	0.1089
WW0816 Intact	3.432
WW0816 Cleaved	0.01356



	EC50
WW0126 Mouse IFNA1	2.265
WW0817 Intact	10.69
WW0817 Cleaved	0.1334

FIG. 10G



	EC50
WW0126 Mouse IFNa1	2.383
WW0819 Intact	24.72
WW0819 Cleaved	0.1559

FIG. 10H

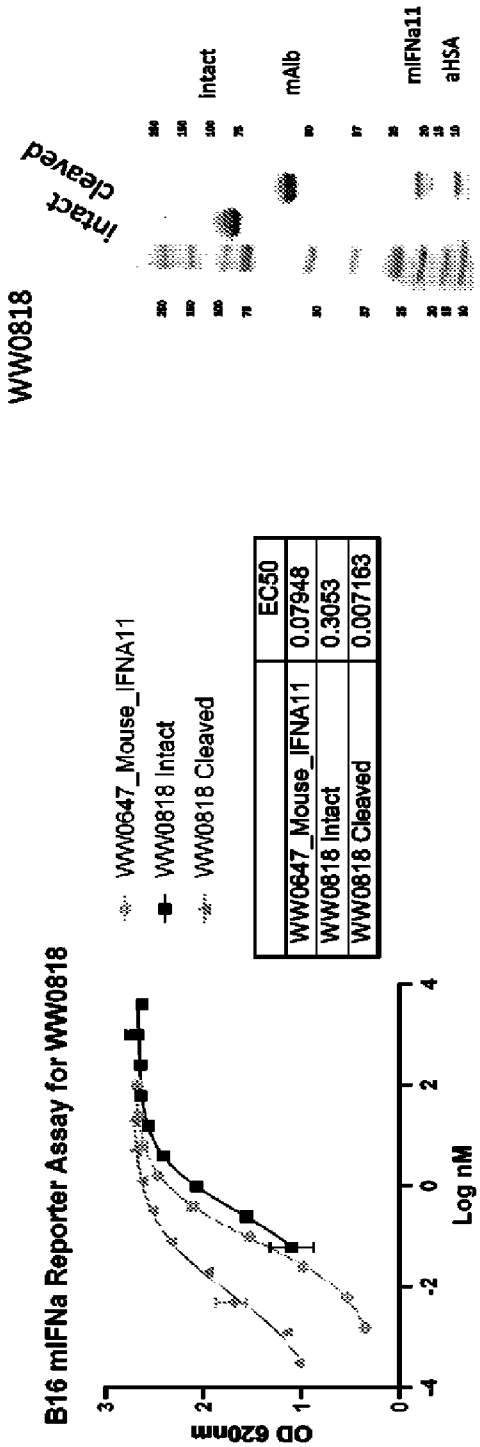


FIG. 10I

FIG. 10J

FIG. 11

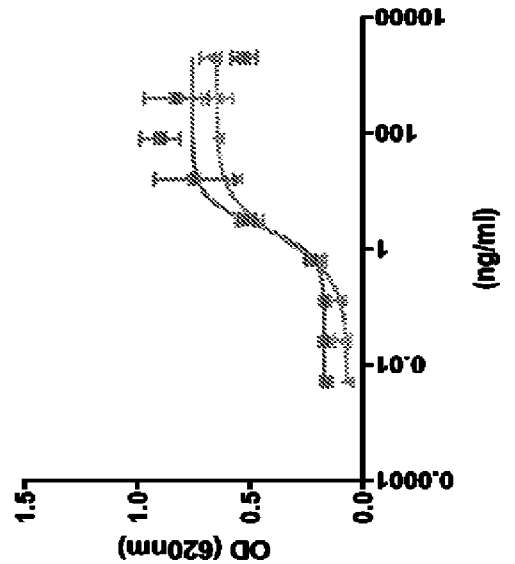


FIG. 11B

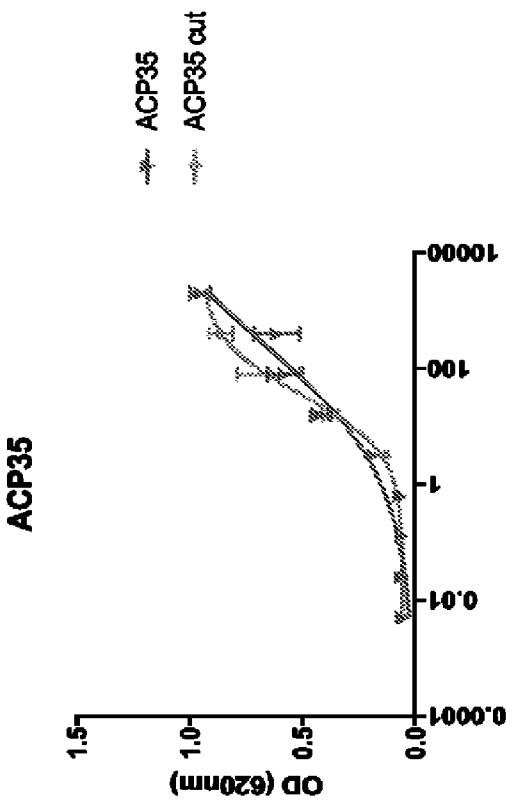


FIG. 11A

FIG. 12A-12D:

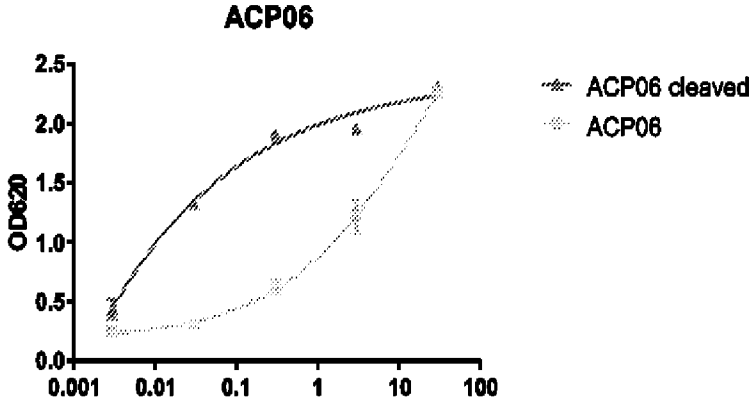


FIG. 12A

ACP08:

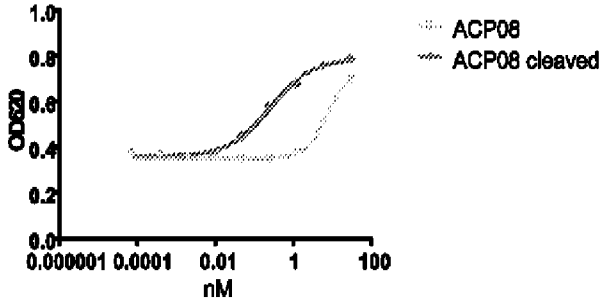


FIG. 12B

ACP07:

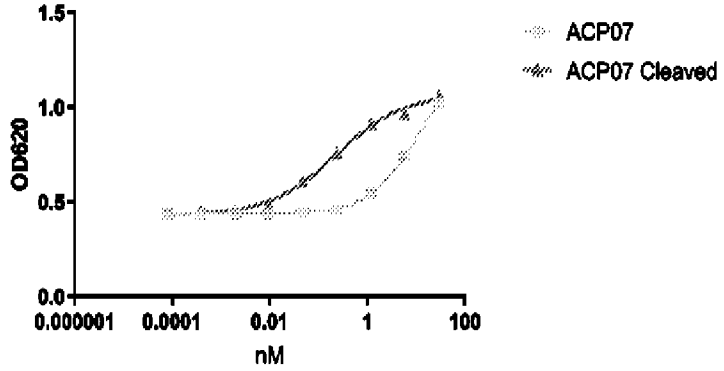


FIG. 12C

ACP09:

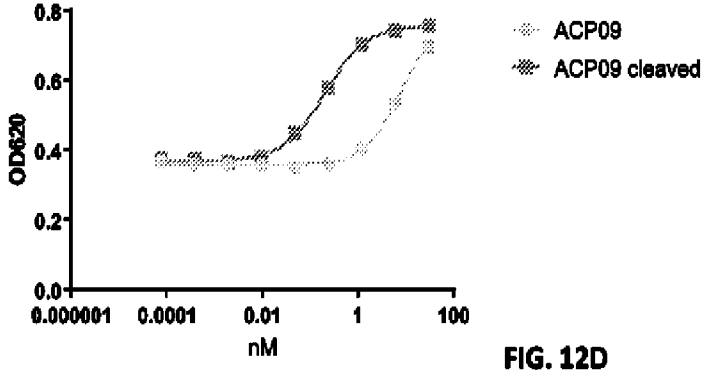


FIG. 12D

FIG. 12E-12F:

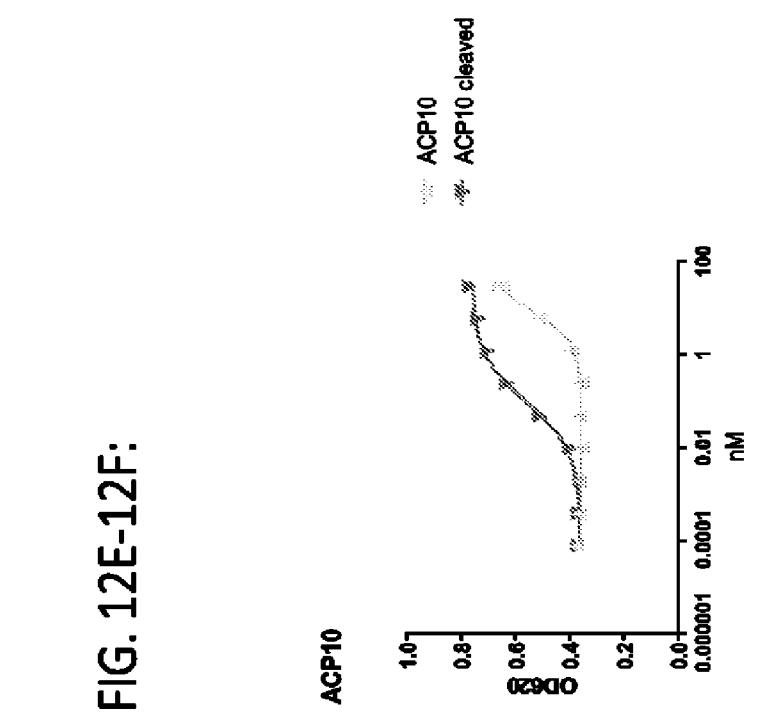


FIG. 12E

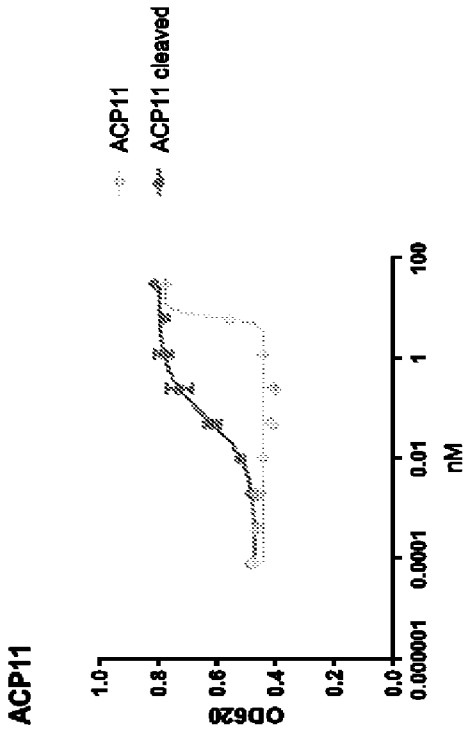


FIG. 12F

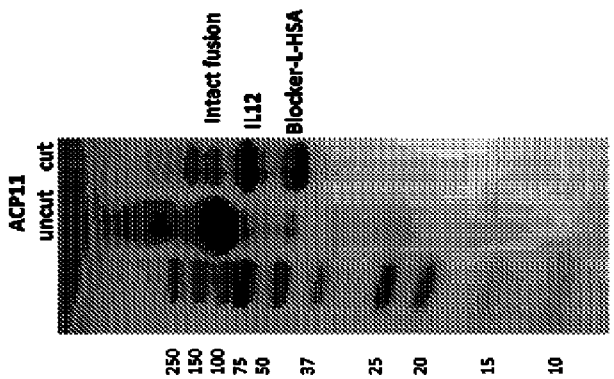

ACP11
uncut cut
Intact fusion
IL12
Blocker-L-HSA
250
150
100
75
50
37
25
20
15
10

FIG. 13:

FIG. 14

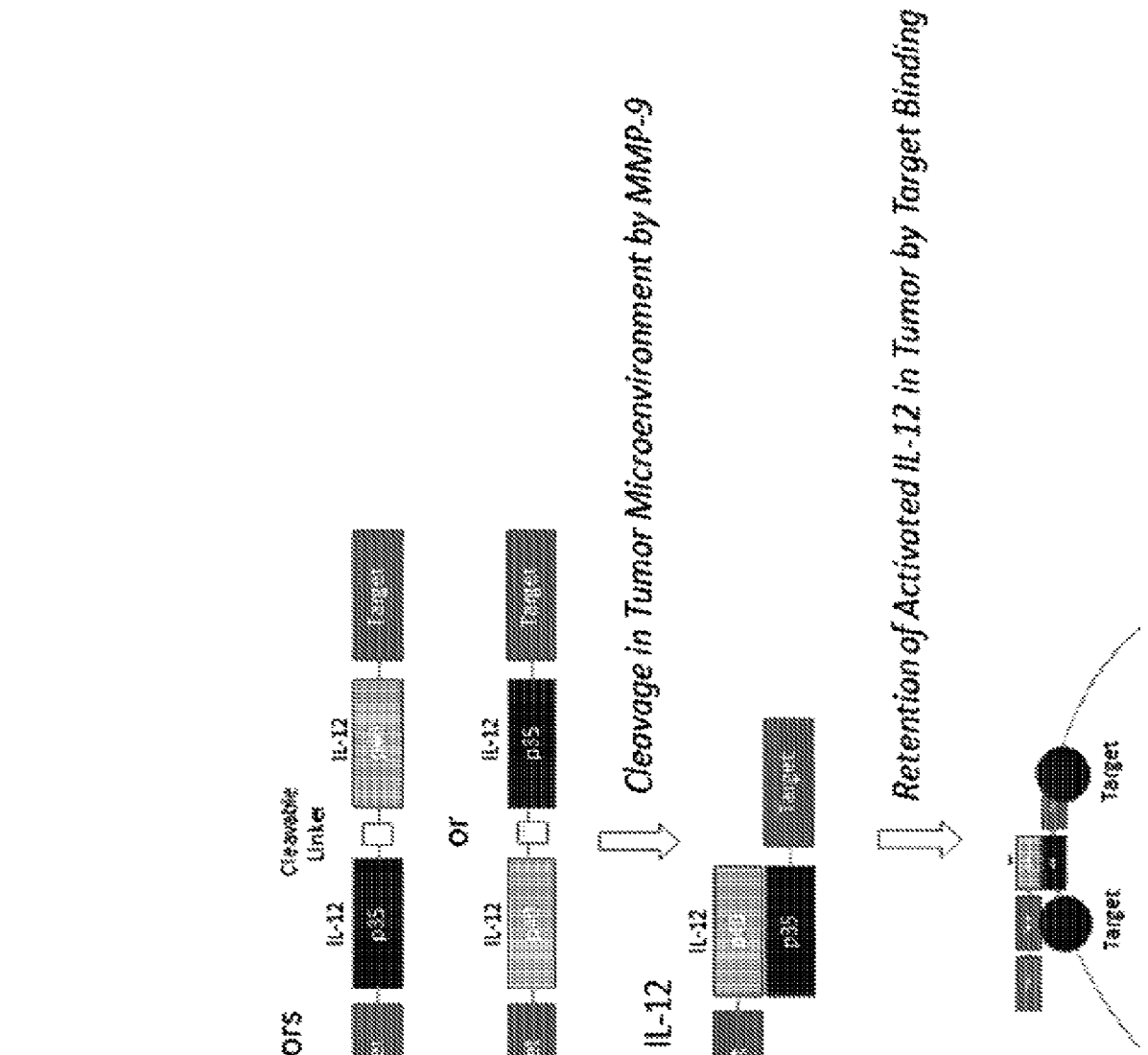

Inactive Precursors
Cleavable Linker
IL-12
p35
Target
or
Cleavage in Tumor Microenvironment by MMP-9
Active, Targeted IL-12
Retention of Activated IL-12 in Tumor by Target Binding
Target
Target

FIG. 15A

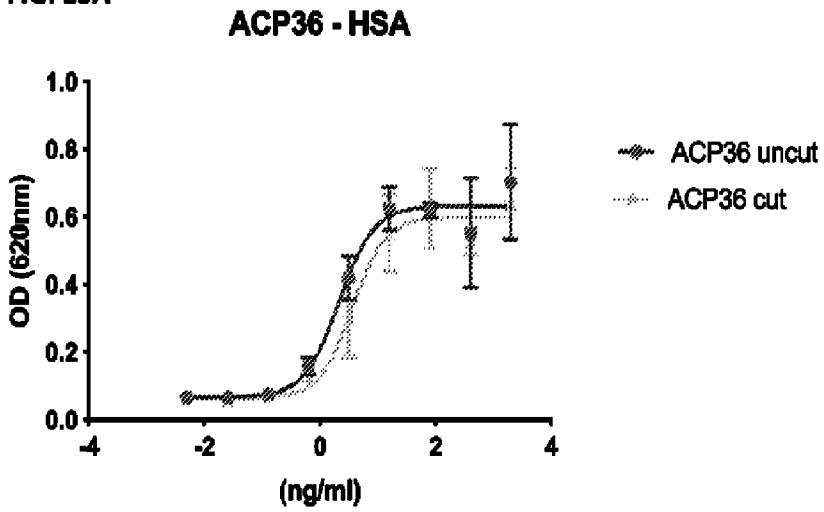


FIG. 15B

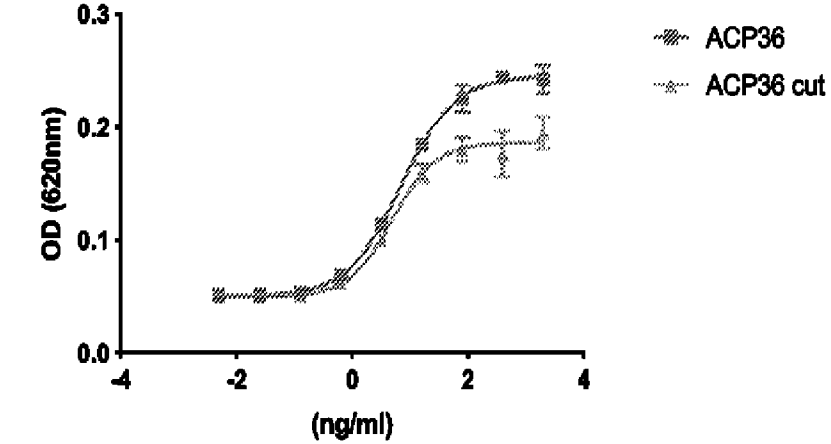


FIG. 15C

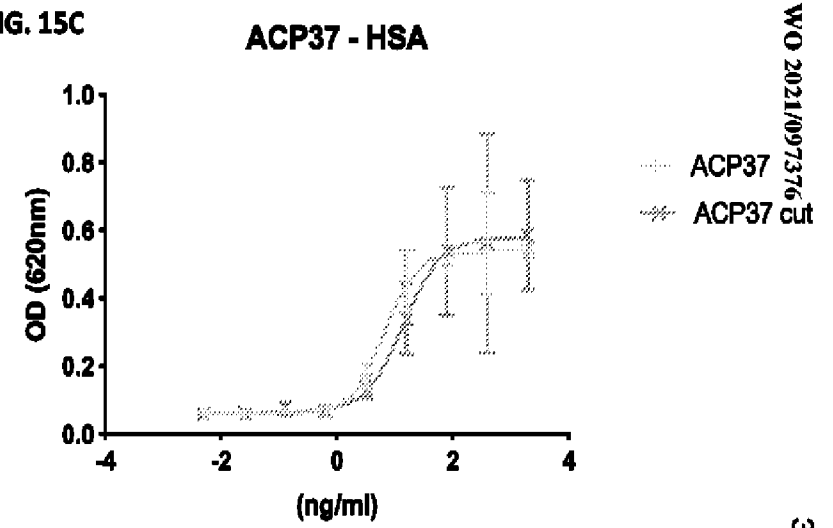


FIG. 15D

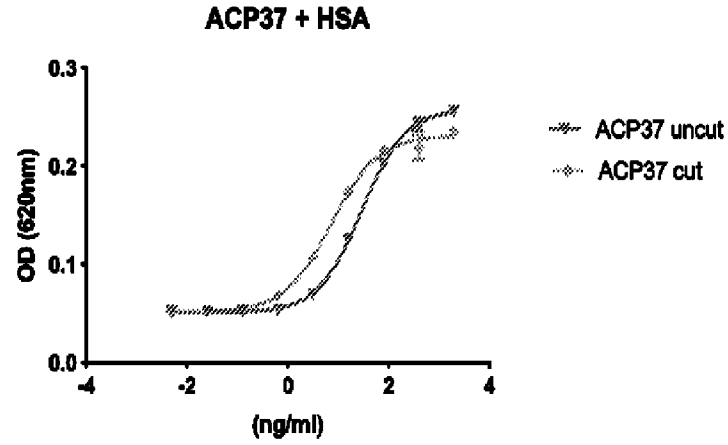
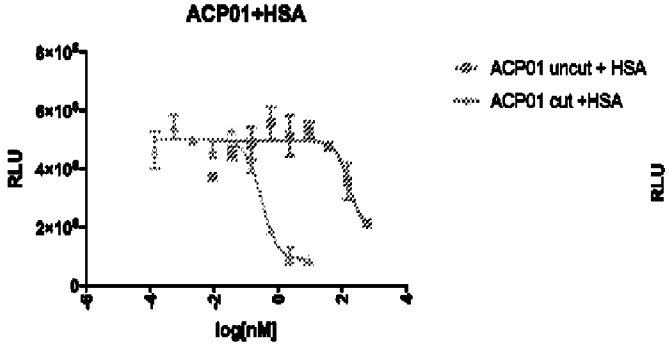
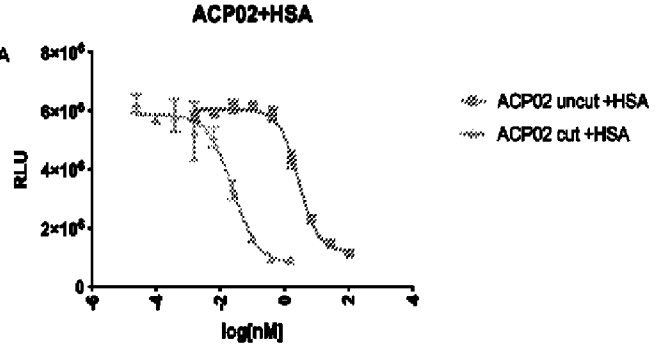


FIG. 16A-16F:



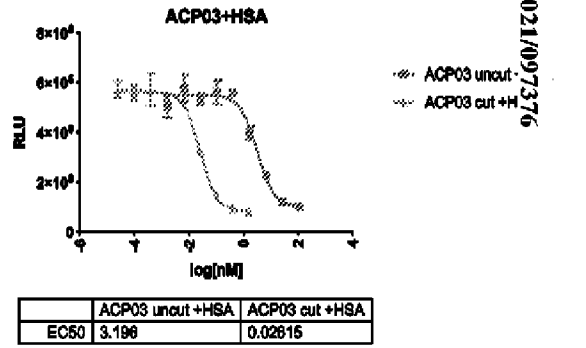
	ACP01 uncut + HSA	ACP01 cut +HSA
EC50	163.4	0.2990

FIG. 16A



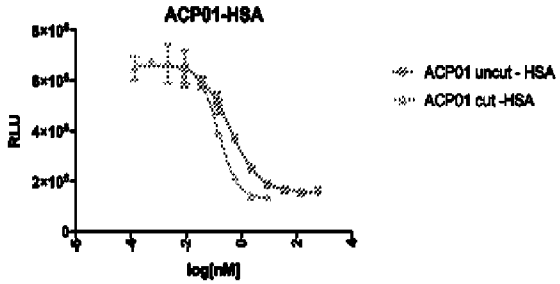
	ACP02 uncut +HSA	ACP02 cut +HSA
EC50	2.797	0.02478

FIG. 16C



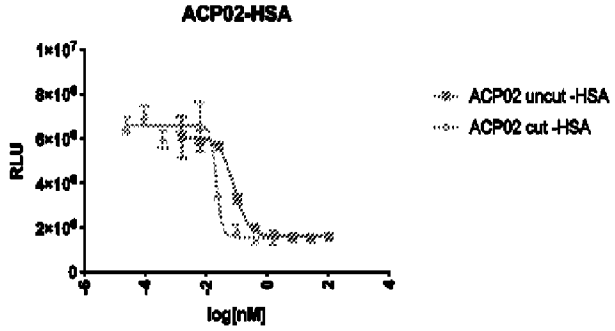
	ACP03 uncut +HSA	ACP03 cut +HSA
EC50	3.196	0.02615

FIG. 16E



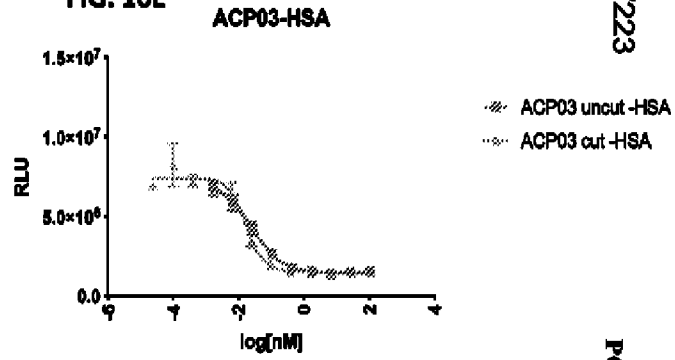
	ACP01 uncut - HSA	ACP01 cut -HSA
EC50	0.3787	0.1521

FIG. 16B



	ACP02 uncut -HSA	ACP02 cut -HSA
EC50	0.08499	0.02230

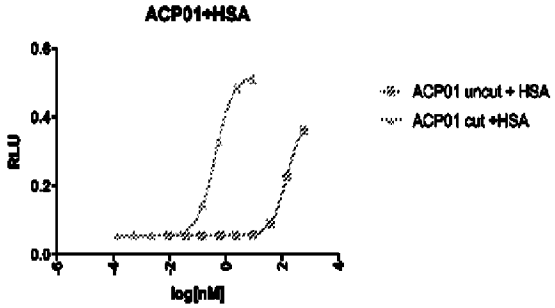
FIG. 16D



	ACP03 uncut -HSA	ACP03 cut -HSA
EC50	0.02611	0.01697

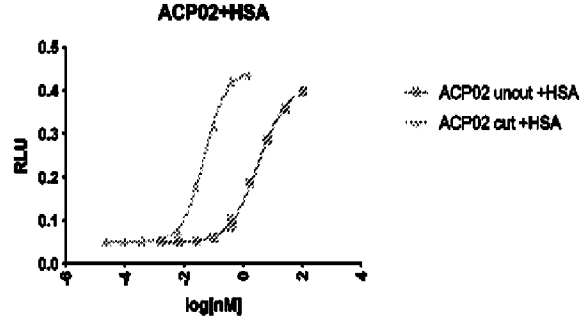
FIG. 16F

FIG. 17A-17F:



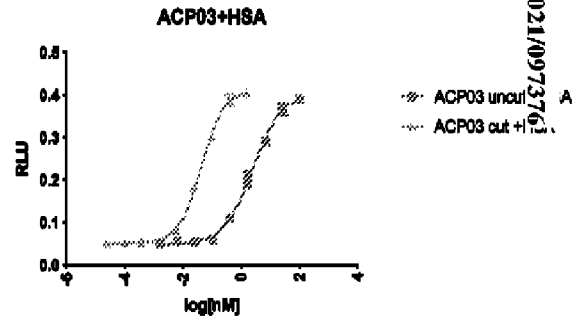
	ACP01 uncut + HSA	ACP01 cut +HSA
EC50	147.0	0.4295

FIG. 17A



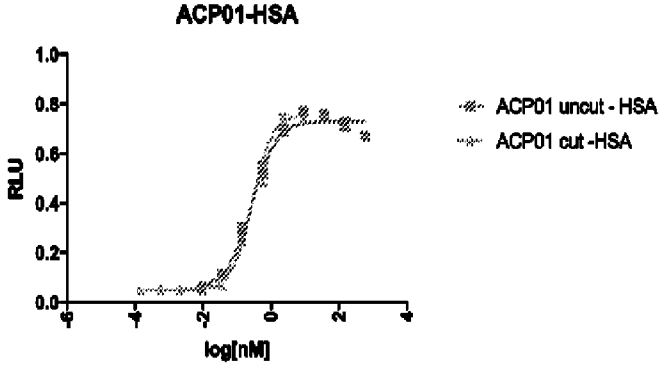
	ACP02 uncut +HSA	ACP02 cut +HSA
EC50	3.234	0.05013

FIG. 17C



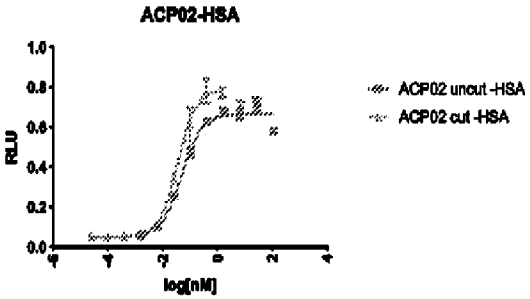
	ACP03 uncut +HSA	ACP03 cut +HSA
EC50	2.587	0.04462

FIG. 17E



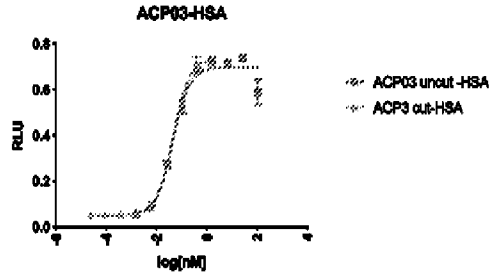
	ACP01 uncut - HSA	ACP01 cut -HSA
EC50	0.2730	0.2869

FIG. 17B



	ACP02 uncut -HSA	ACP02 cut -HSA
EC50	0.05001	0.03578

FIG. 17D



	ACP03 uncut -HSA	ACP3 cut-HSA
EC50	0.04556	0.04677

FIG. 17F

FIG. 18:

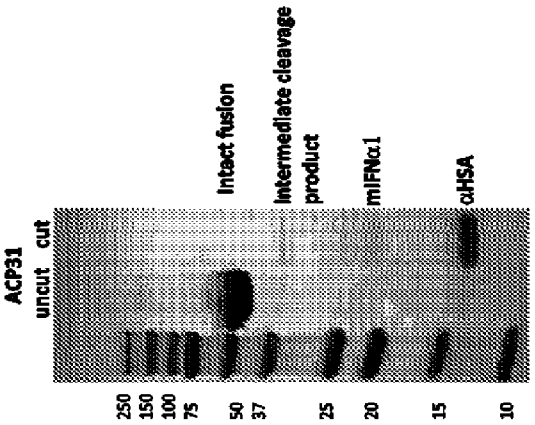


Fig. 18A

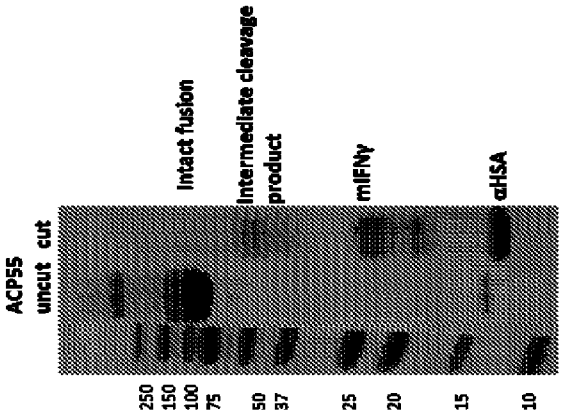


Fig. 18B

FIG 19.

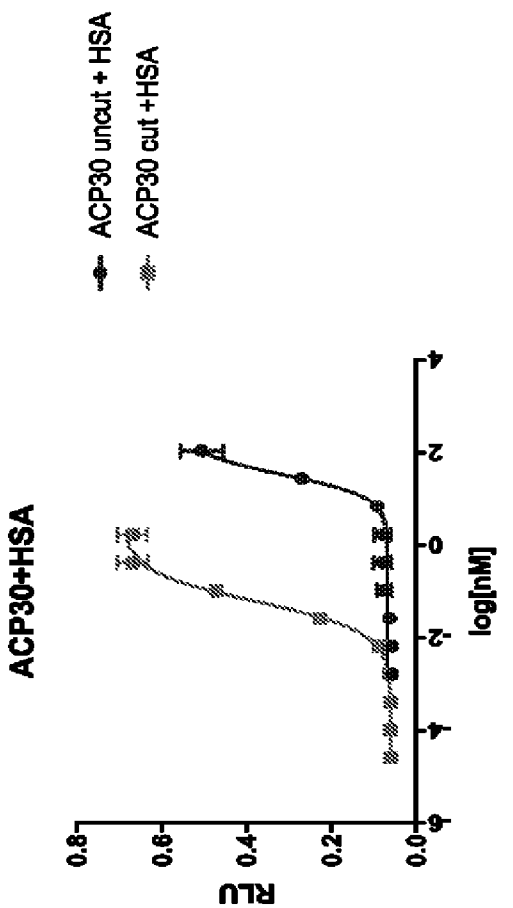


FIG. 19A

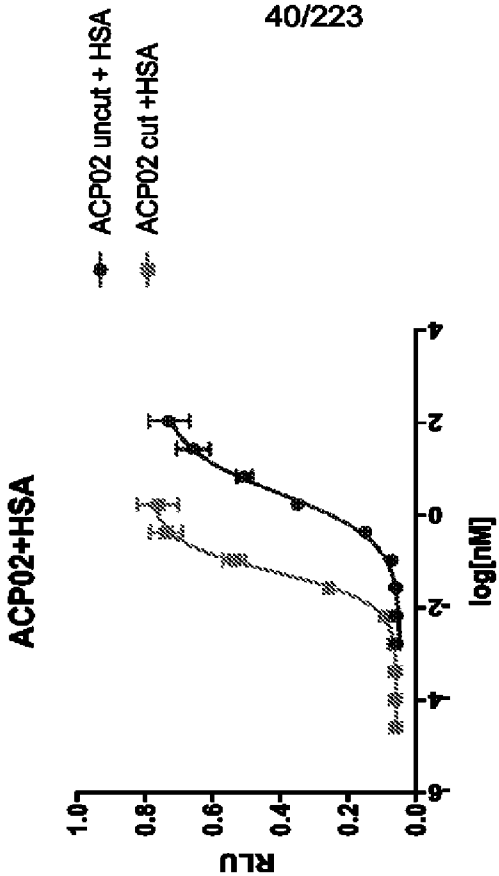
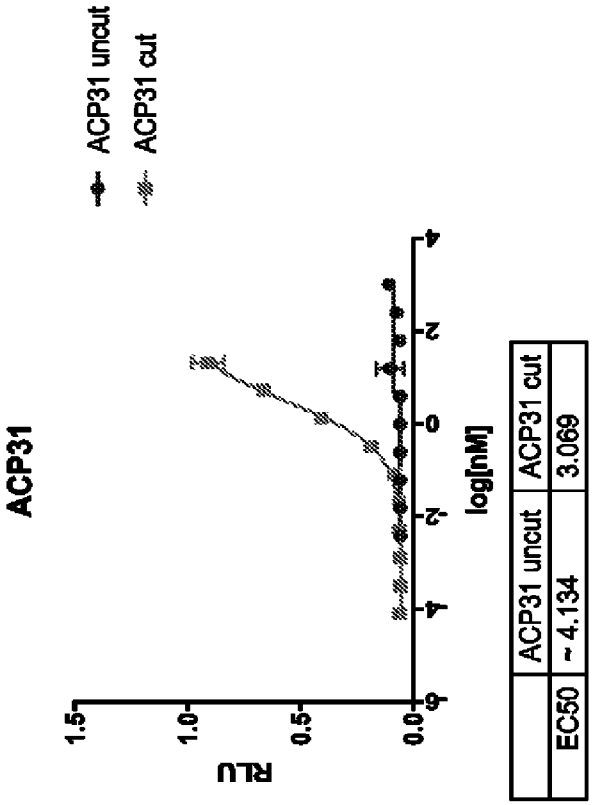


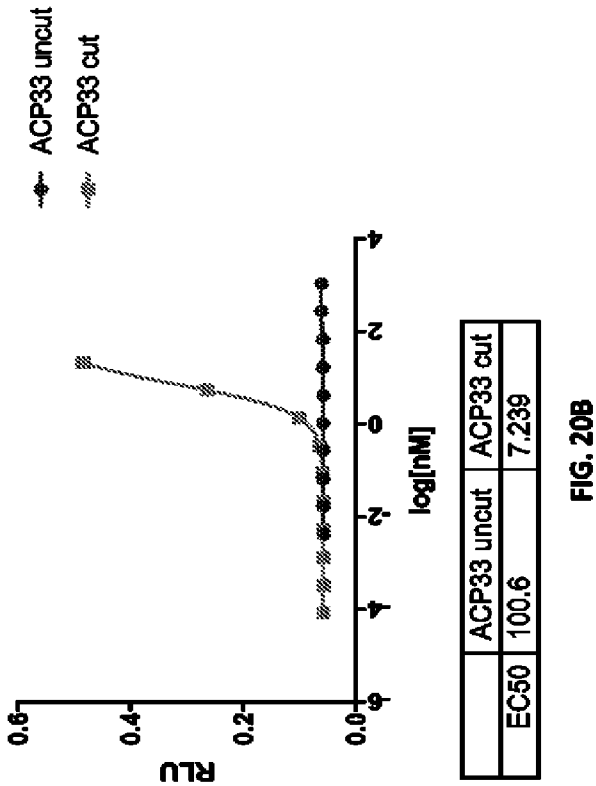
FIG. 19B

FIG. 20



	ACP31 uncut	ACP31 cut
EC50	~ 4.134	3.069

FIG. 20A



	ACP33 uncut	ACP33 cut
EC50	100.6	7.239

FIG. 20B

FIG. 21:

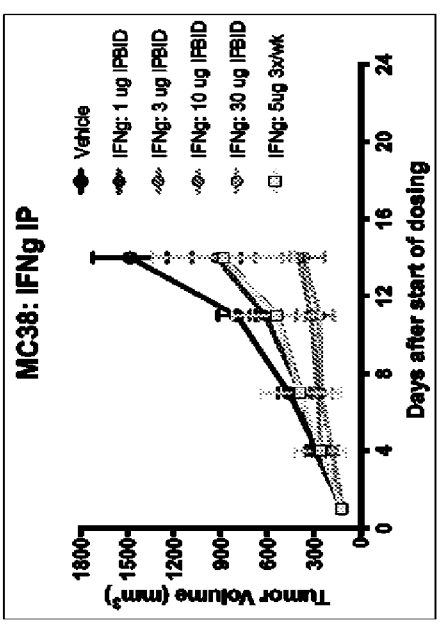


FIG. 21A

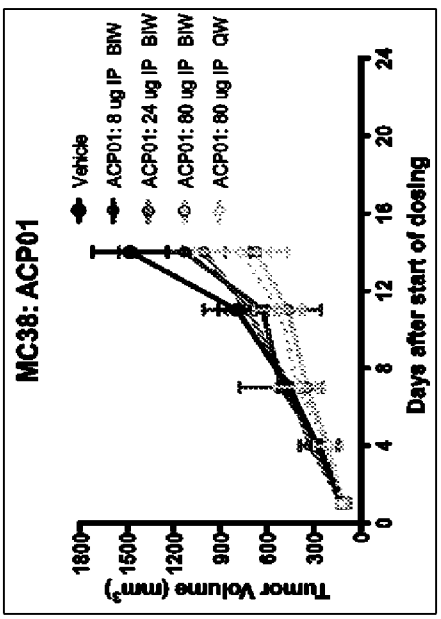


FIG. 21B

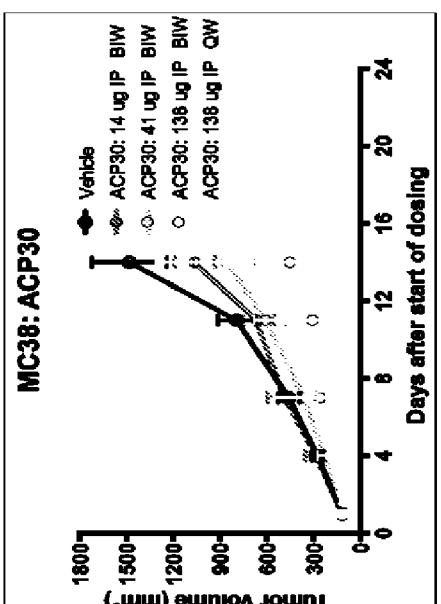


FIG. 21C

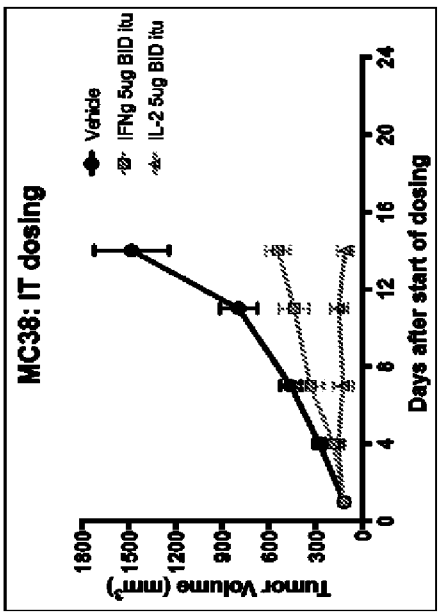
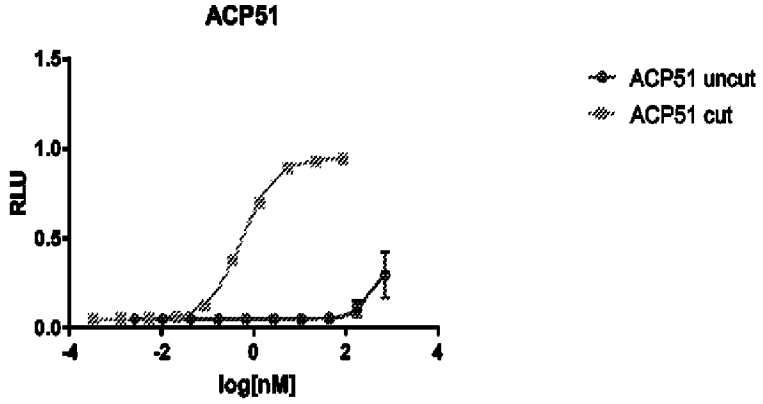


FIG. 21D

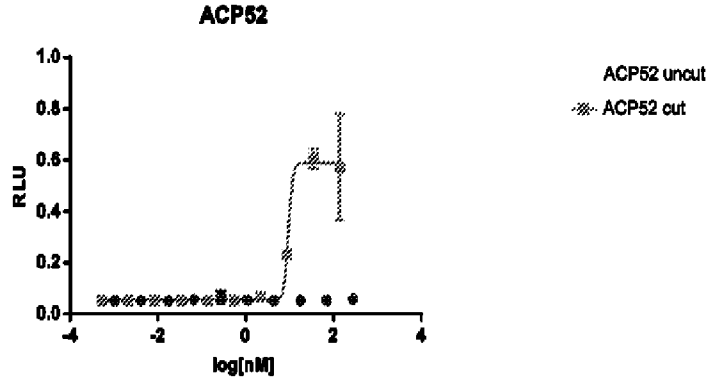
FIG. 22

FIG. 22A



	ACP51 uncut	ACP51 Preactivated MMP9
EC50	343.2	0.5649

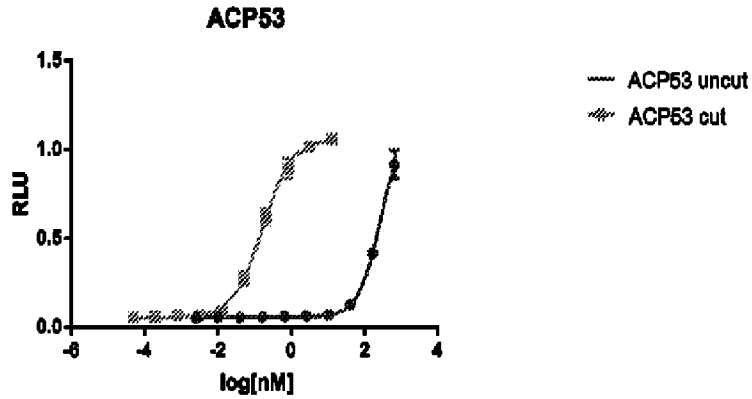
FIG. 22B



	ACP52 uncut	ACP52 Preactivated MMP9
EC50		~ 9.475

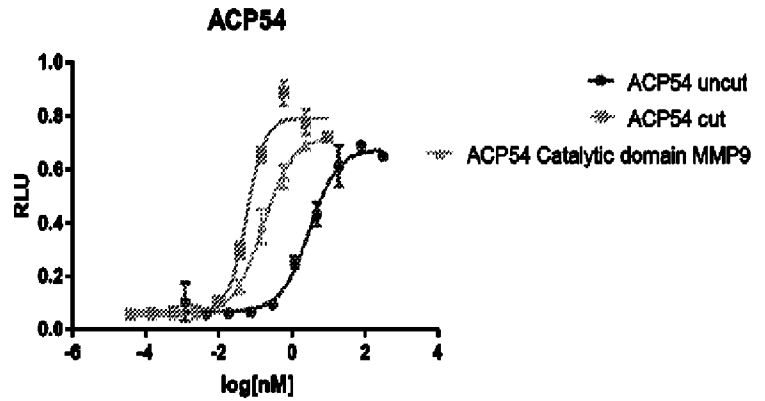
FIG. 23

FIG. 23A



	ACP53 uncut	ACP53 Preactivated MMP9
EC50	283.5	0.164

FIG. 23B



	ACP54 uncut	ACP54 Preactivated MMP9	ACP54 Catalytic domain MMP9
EC50	3.03	0.05893	0.1647

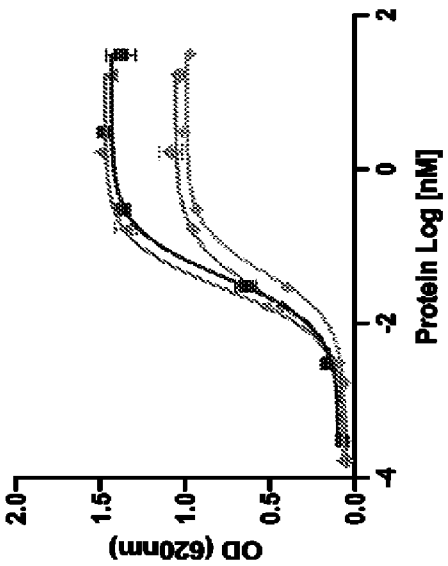
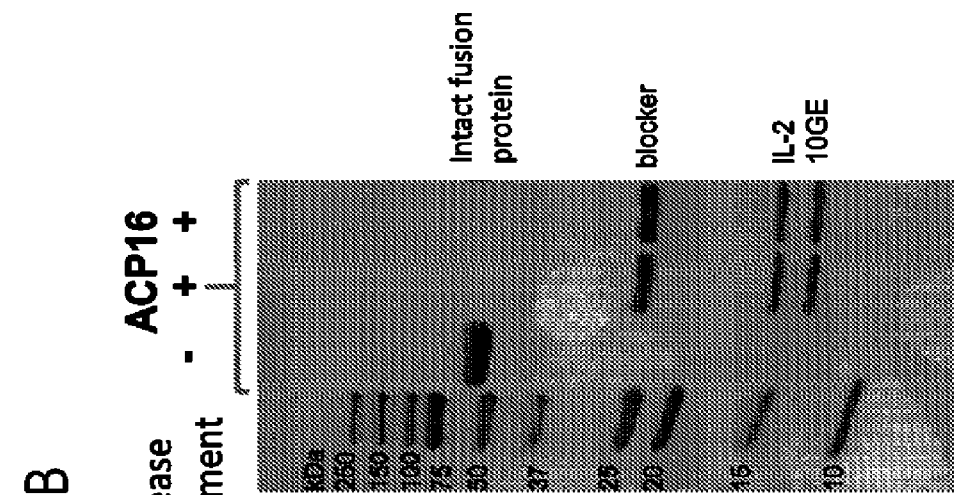

ACP133 (- alb)
ACP132 (- alb)
ACP133 (+ alb)
ACP132(+ alb)
EC50
ACP133 (- alb) 0.03946
ACP132 (- alb) 0.02814
ACP133 (+ alb) 0.04565
ACP132(+ alb) 0.02589
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
Protein Log [nM]

FIG. 24A

FIG. 24B


Protease treatment
ACP16
-
+
+
kDa
260
150
100
75
50
37
25
20
15
10
Intact fusion protein
blocker
IL-2 10GE

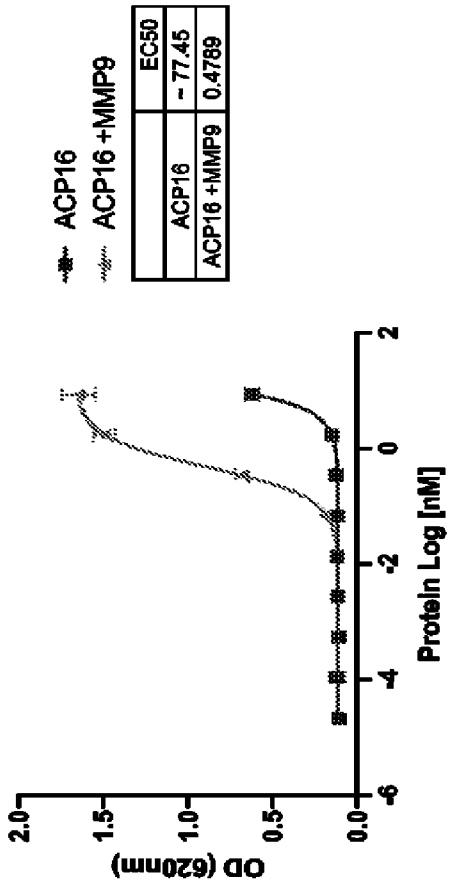
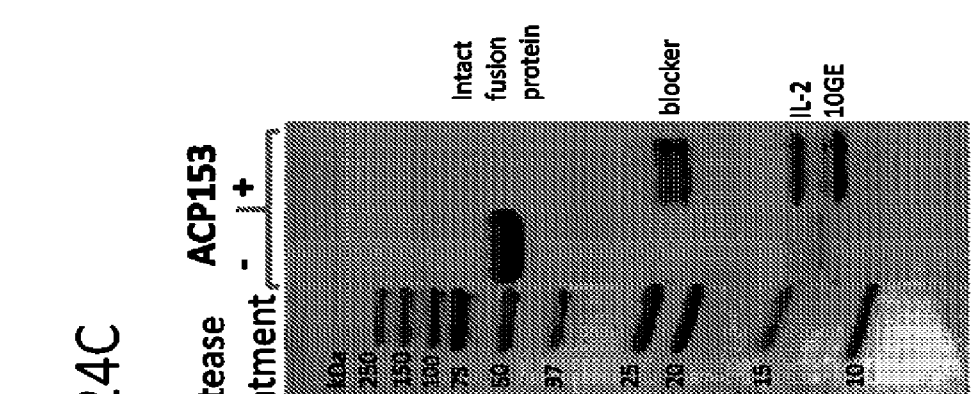

ACP16
ACP16 +MMP9
EC50
ACP16 - 77.45
ACP16 +MMP9 0.4789
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Protein Log [nM]

FIG. 24C


Protease treatment
ACP153
-
+
kDa
250
150
100
75
50
37
25
20
15
10
Intact fusion protein
blocker
IL-2
10GE

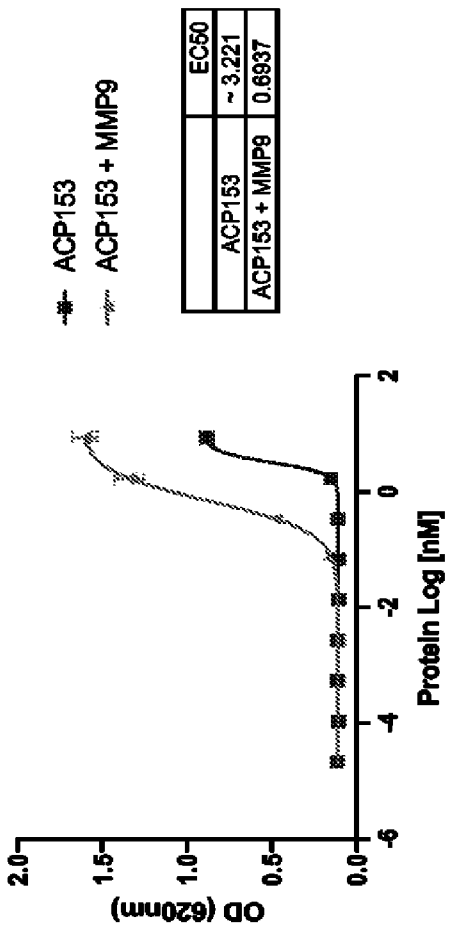

ACP153
ACP153 + MMP9
EC50
ACP153
~ 3.221
ACP153 + MMP9
0.6937
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Protein Log [nM]

FIG. 24D

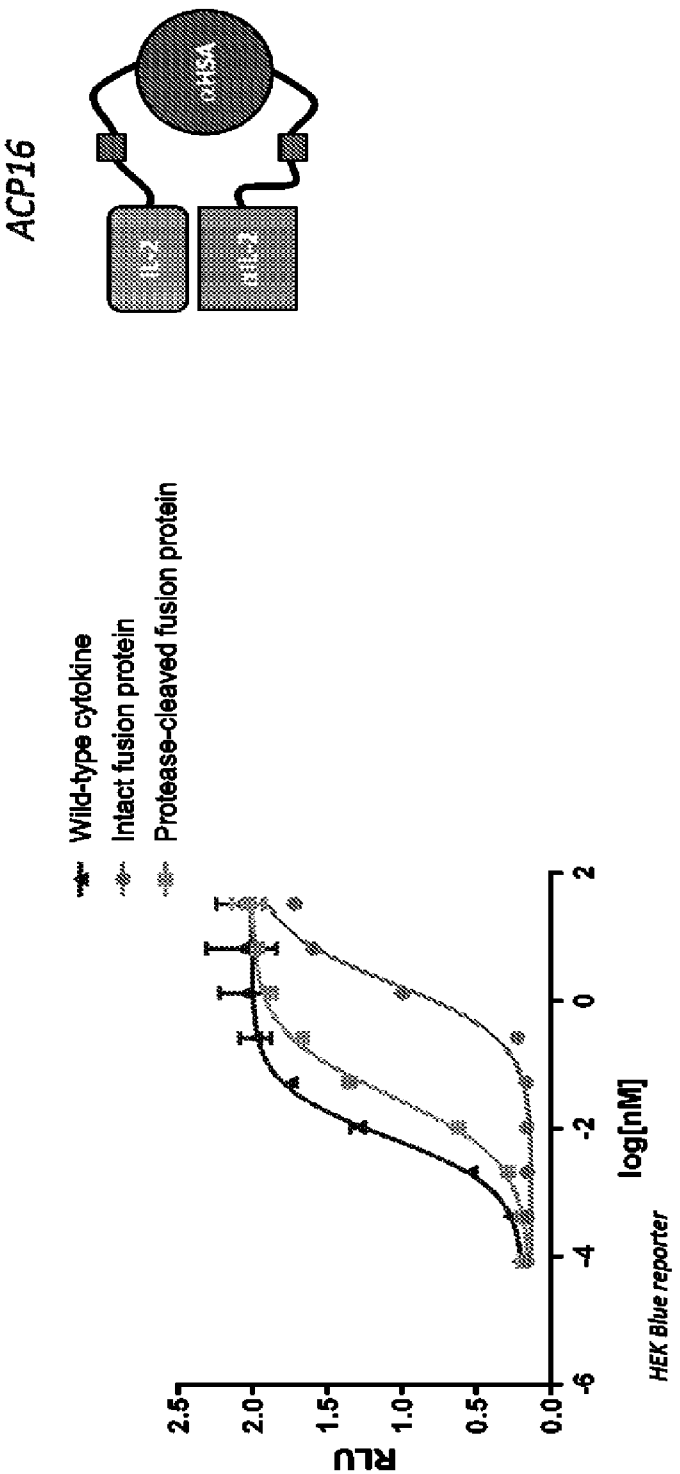
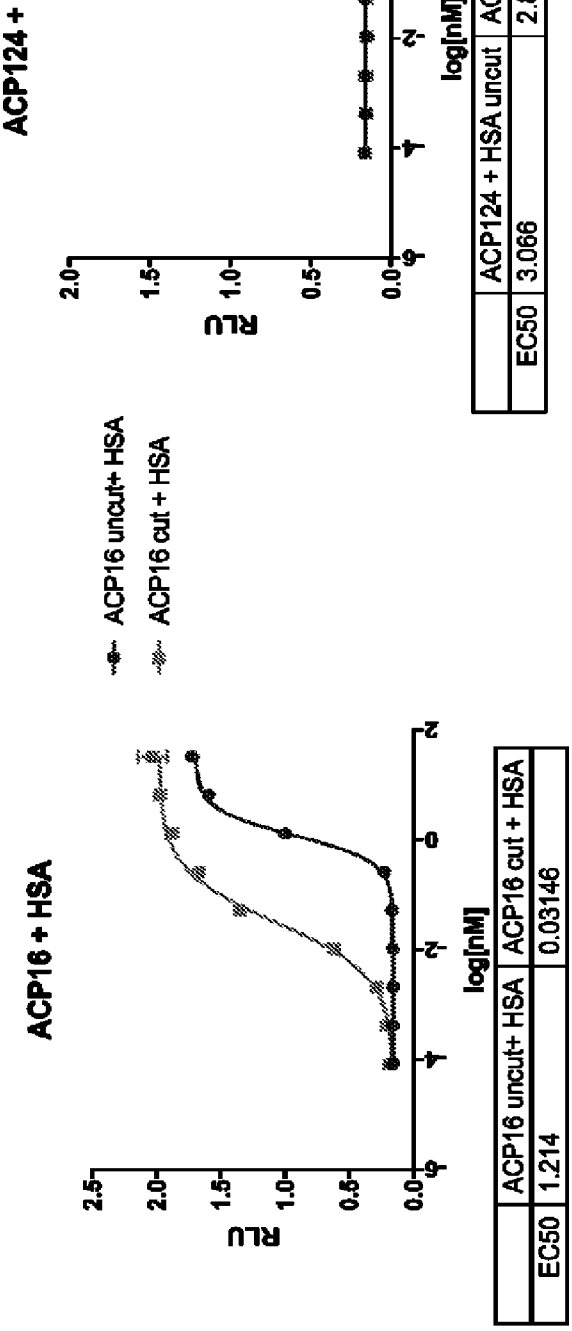

ACP16
IL-2
anti-HSA
anti-IL-2
Wild-type cytokine
Intact fusion protein
Protease-cleaved fusion protein
RLU
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
log[nM]
HEK Blue reporter

FIG. 25



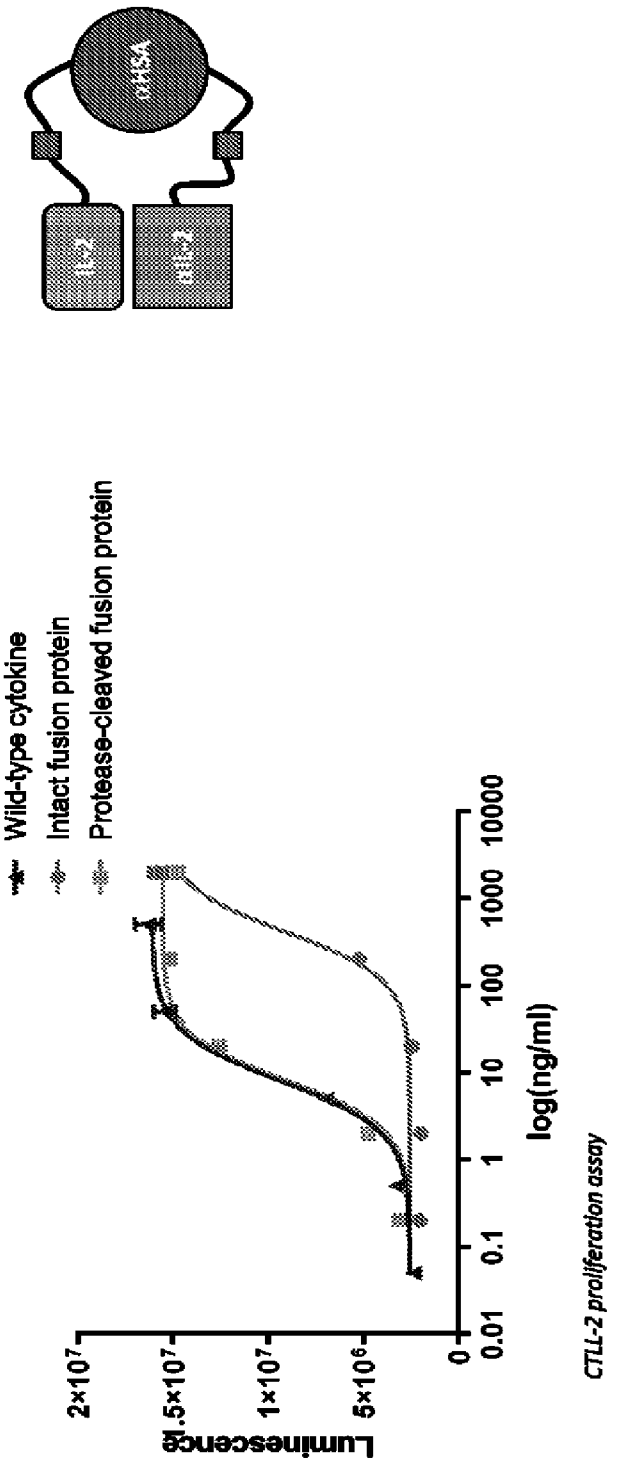
	ACP16 uncut+ HSA	ACP16 cut + HSA
EC50	1.214	0.03146

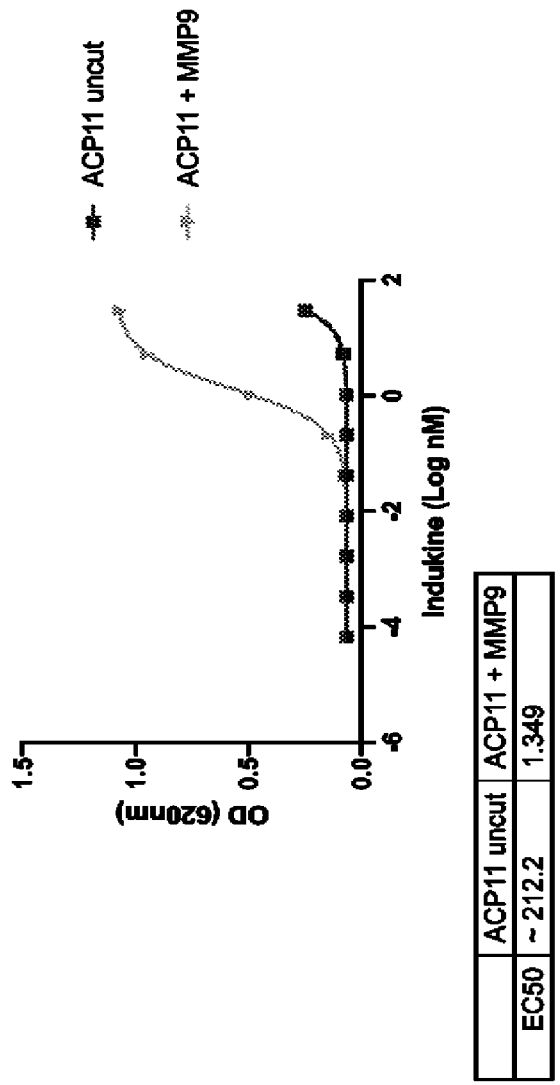
FIG. 25A

	ACP124 + HSA uncut	ACP124+ HSA cut
EC50	3.066	2.865

FIG. 25B

FIG. 25C


ACP16
IL-2
anti-HSA
anti-IL-2
Wild-type cytokine
Intact fusion protein
Protease-cleaved fusion protein
Luminescence
2×10^7
1.5×10^7
1×10^7
5×10^6
0
0.01
0.1
1
10
100
1000
10000
log(ng/ml)
CTLL-2 proliferation assay



	ACP11 uncut	ACP11 + MMP9
EC50	~ 212.2	1.349

FIG. 26C

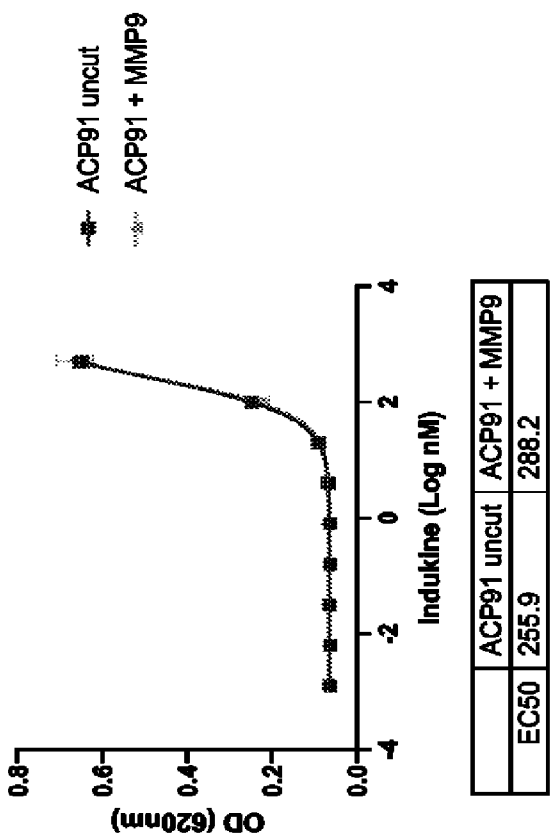

ACP91 uncut
ACP91 + MMP9
OD (620nm)
0.0
0.2
0.4
0.6
0.8
-4
-2
0
2
4
Indukine (Log nM)
ACP91 uncut
ACP91 + MMP9
EC50
255.9
288.2

FIG. 26B

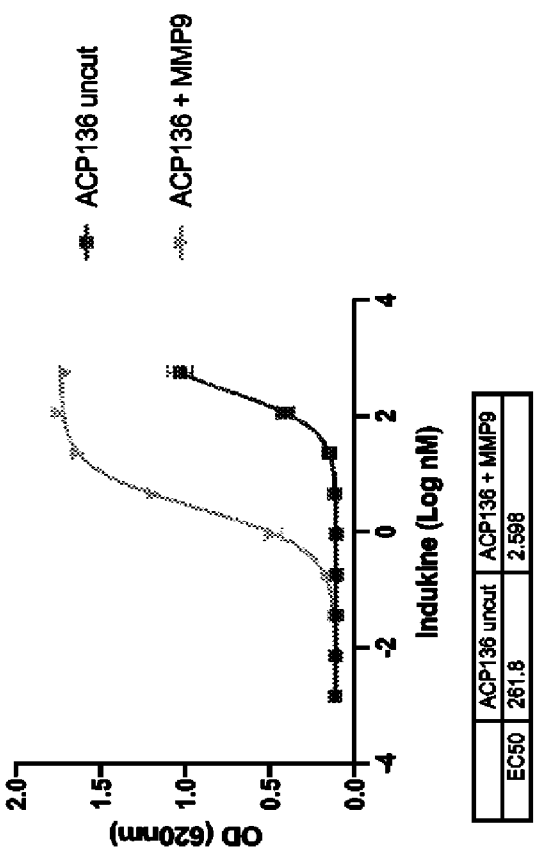
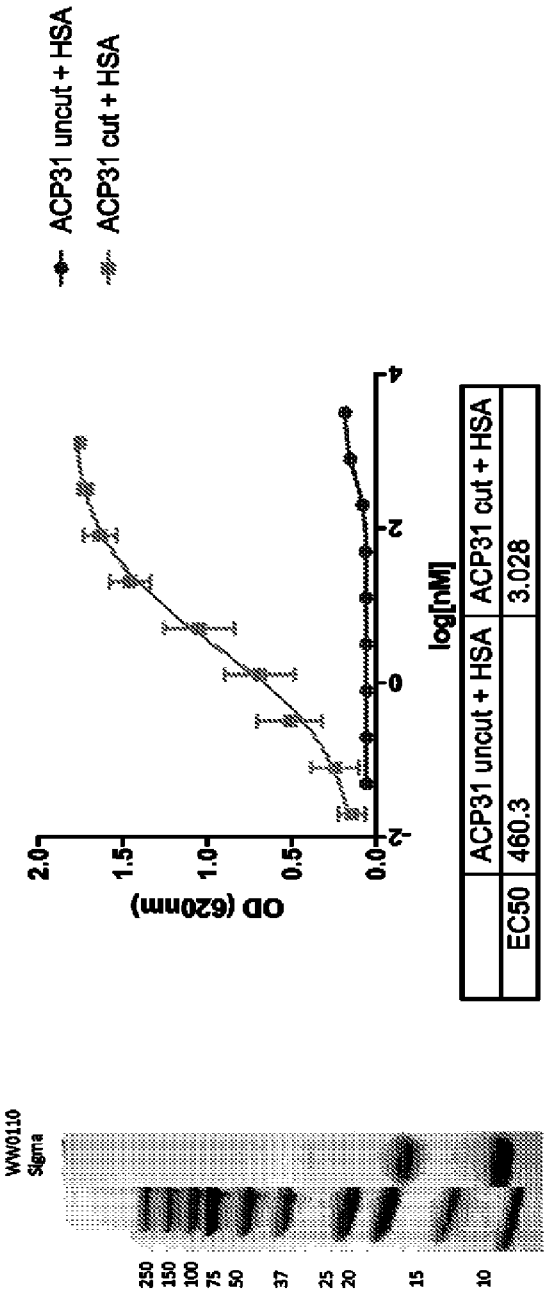

ACP136 uncut
ACP136 + MMP9
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
4
Indukine (Log nM)
ACP136 uncut
ACP136 + MMP9
EC50
261.8
2.598

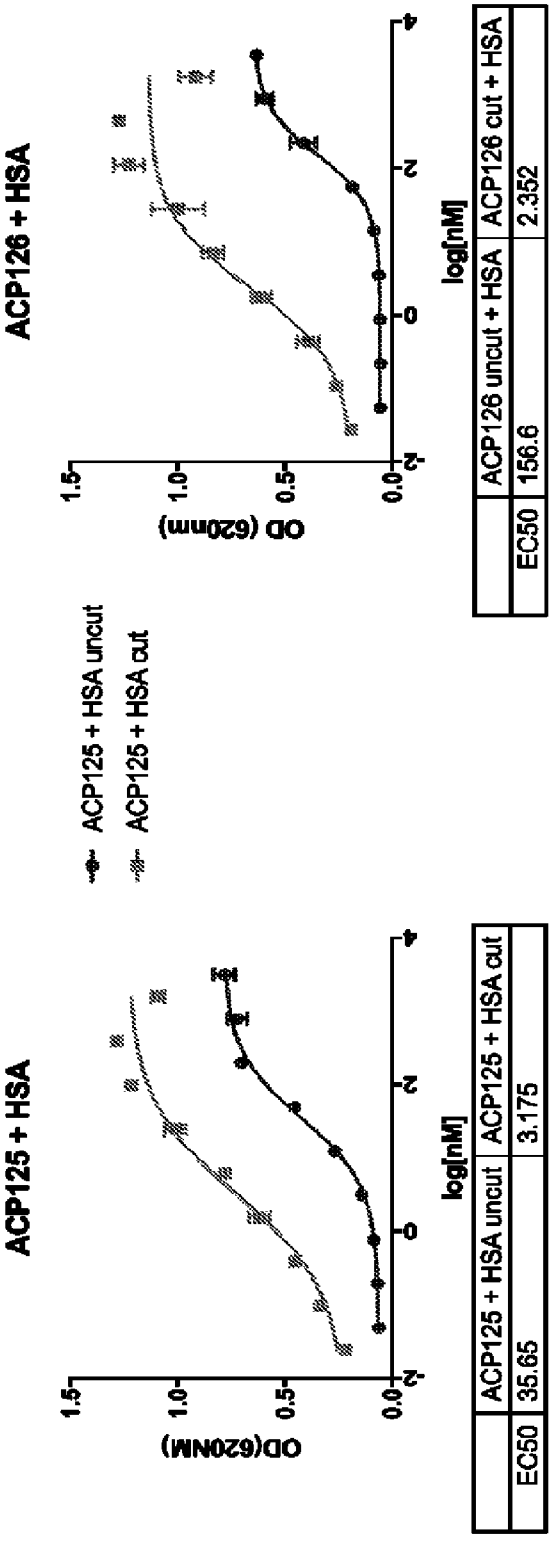
FIG. 26C

FIG. 27A



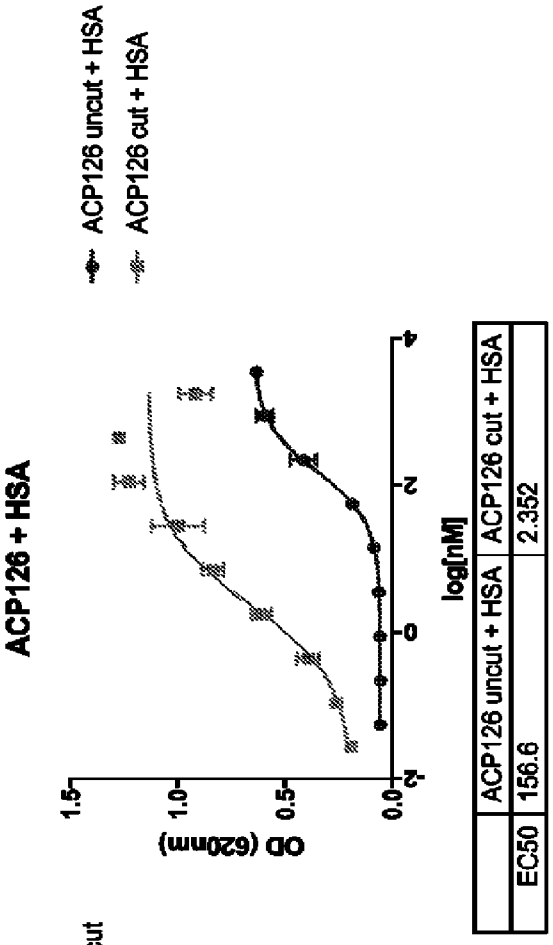
	ACP31 uncut + HSA	ACP31 cut + HSA
EC50	460.3	3.028

FIG. 27



	ACP125 + HSA uncut	ACP125 + HSA cut
EC50	35.65	3.175

Fig 27B

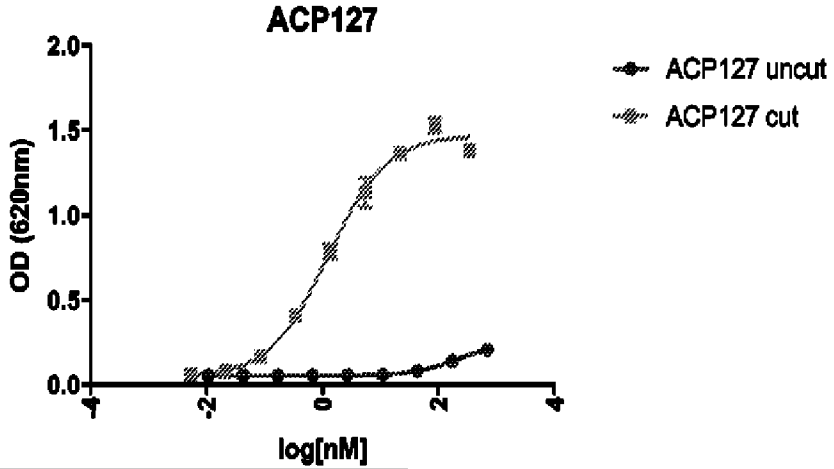


	ACP126 uncut + HSA	ACP126 cut + HSA
EC50	156.6	2.352

Fig 27C

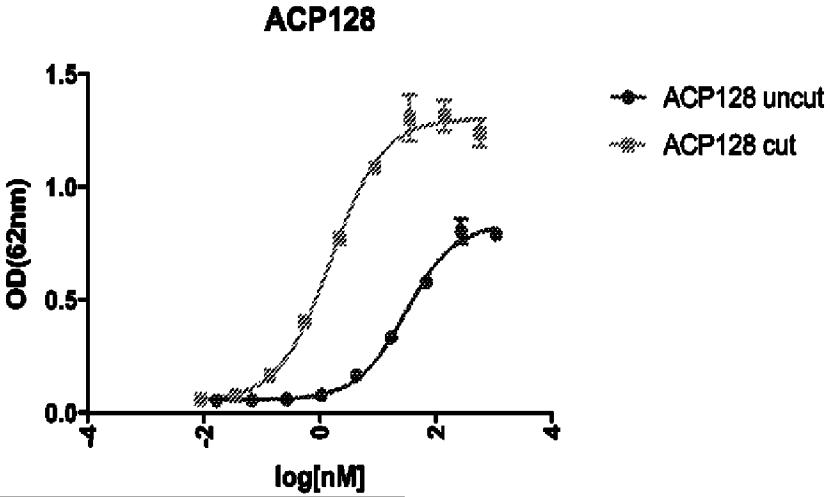
FIG. 27

Fig 27D



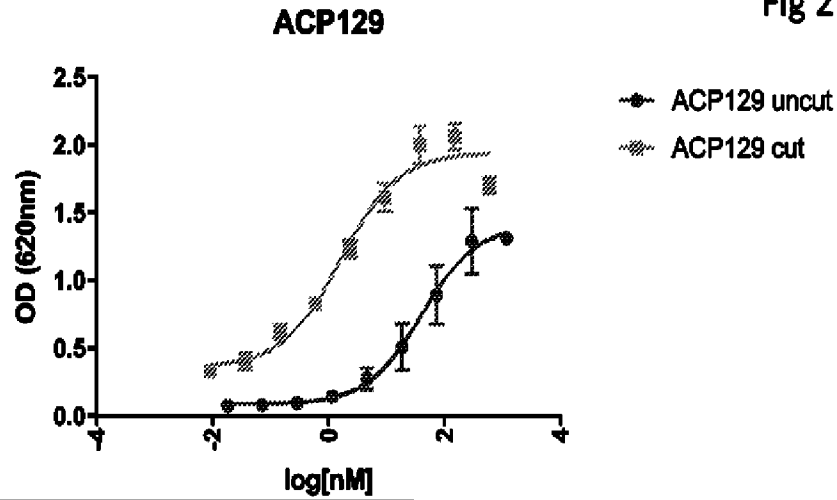
	ACP127 uncut	ACP127 cut
EC50	183.5	1.245

Fig 27E



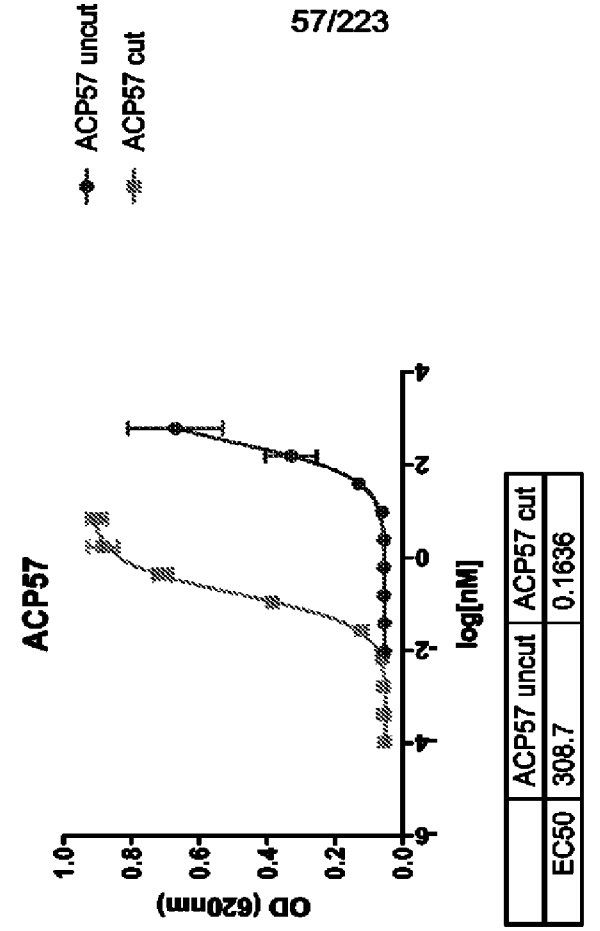
	ACP128 uncut	ACP128 cut
EC50	30.71	1.563

Fig 27F



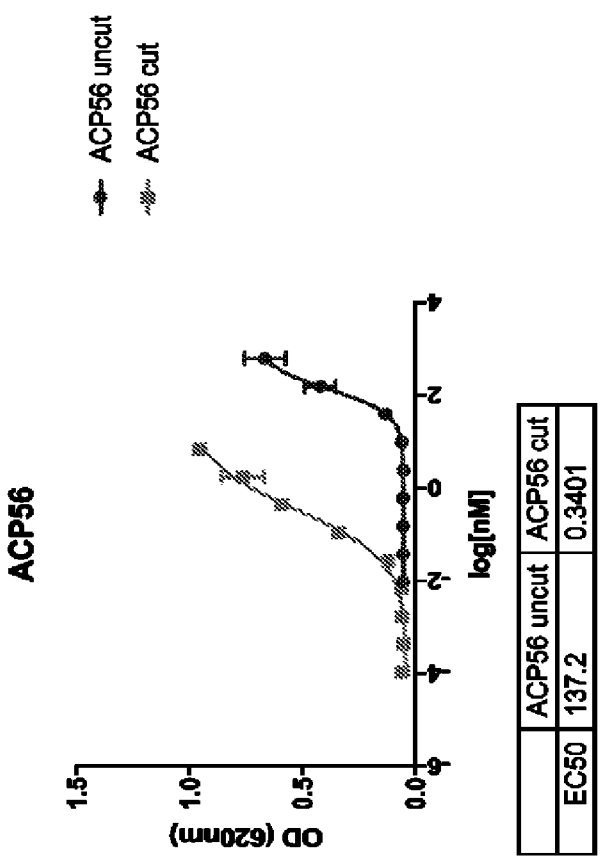
	ACP129 uncut	ACP129 cut
EC50	40.93	1.638

FIG. 28



	ACP57 uncut	ACP57 cut
EC50	308.7	0.1636

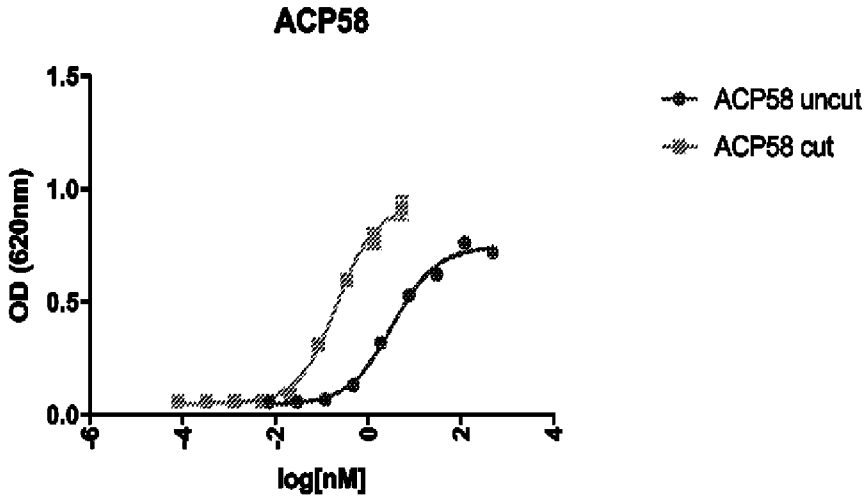
Fig 28B



	ACP56 uncut	ACP56 cut
EC50	137.2	0.3401

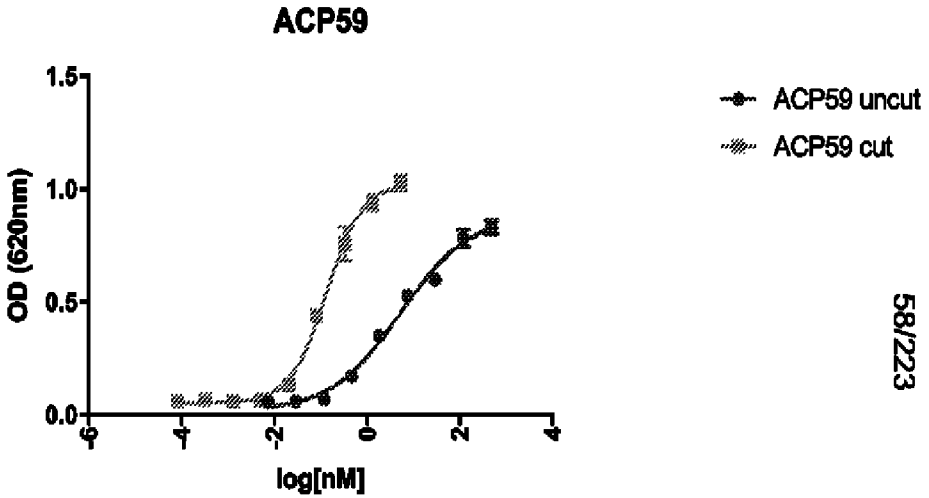
Fig 28A

FIG. 28



	ACP58 uncut	ACP58 cut
EC50	3.360	0.2114

Fig 28C



	ACP59 uncut	ACP59 cut
EC50	5.263	0.1355

Fig 28D

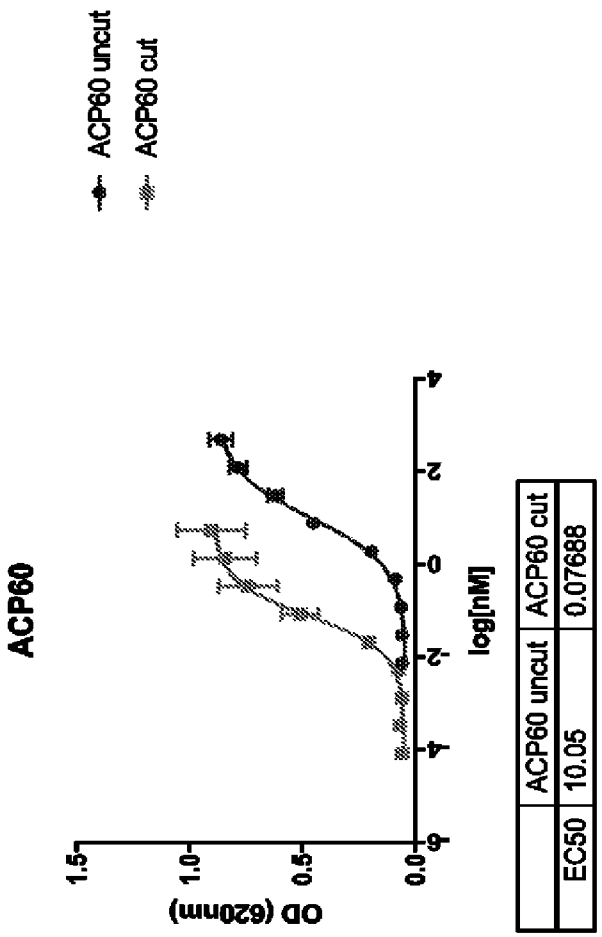

ACP60 uncut
ACP60 cut
ACP60
OD (620nm)
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
4
log[nM]
ACP60 uncut
ACP60 cut
EC50
10.05
0.07688

FIG. 28E

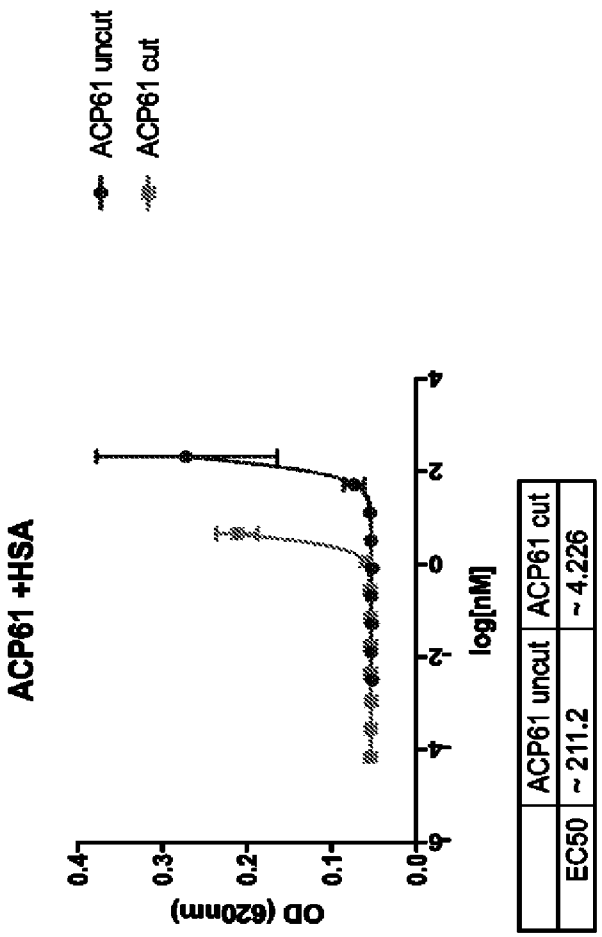
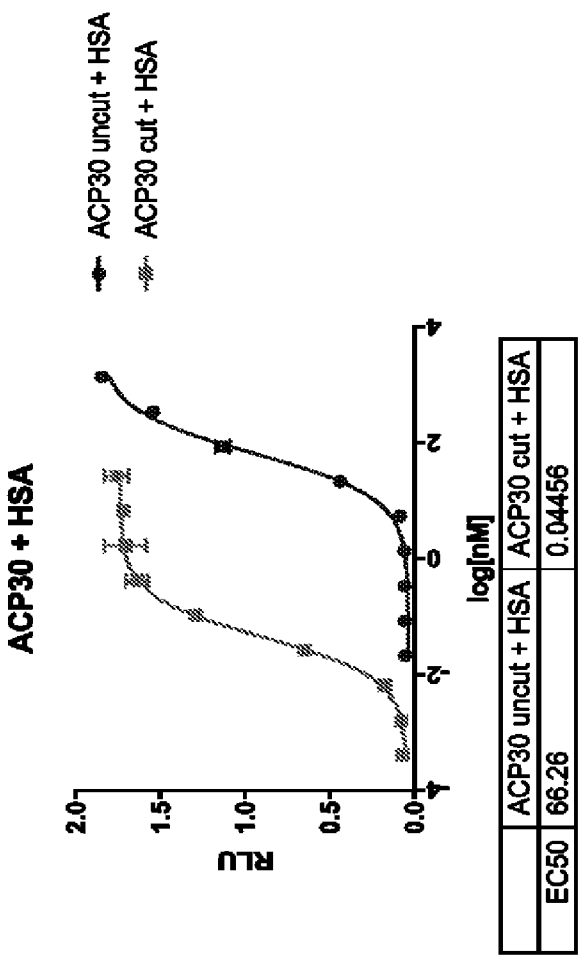

ACP61 uncut
ACP61 cut
ACP61 +HSA
OD (620nm)
0.4
0.3
0.2
0.1
0.0
-6
-4
-2
0
2
4
log[nM]
ACP61 uncut
ACP61 cut
EC50
~ 211.2
~ 4.226

FIG. 28F



	ACP30 uncut + HSA	ACP30 cut + HSA
EC50	66.26	0.04456

FIG. 28G

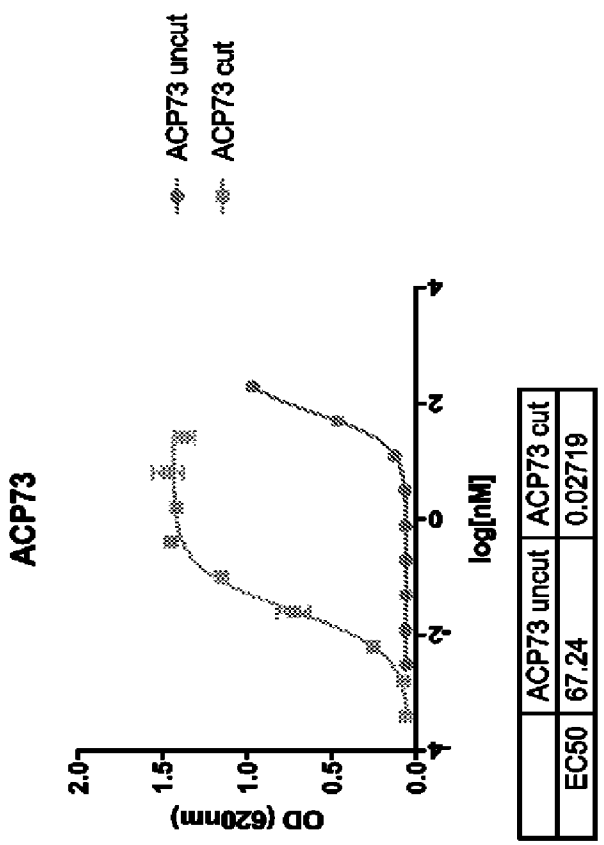
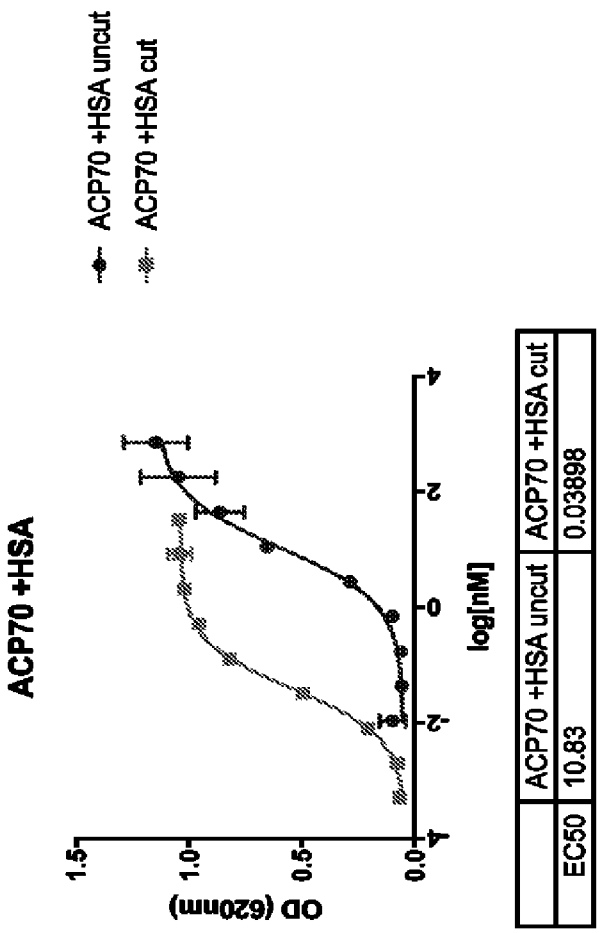

ACP73
ACP73 uncut
ACP73 cut
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
4
log[nM]
ACP73 uncut
ACP73 cut
EC50
67.24
0.02719

FIG. 28H

FIG. 28I



	ACP70 +HSA uncut	ACP70 +HSA cut
EC50	10.83	0.03898

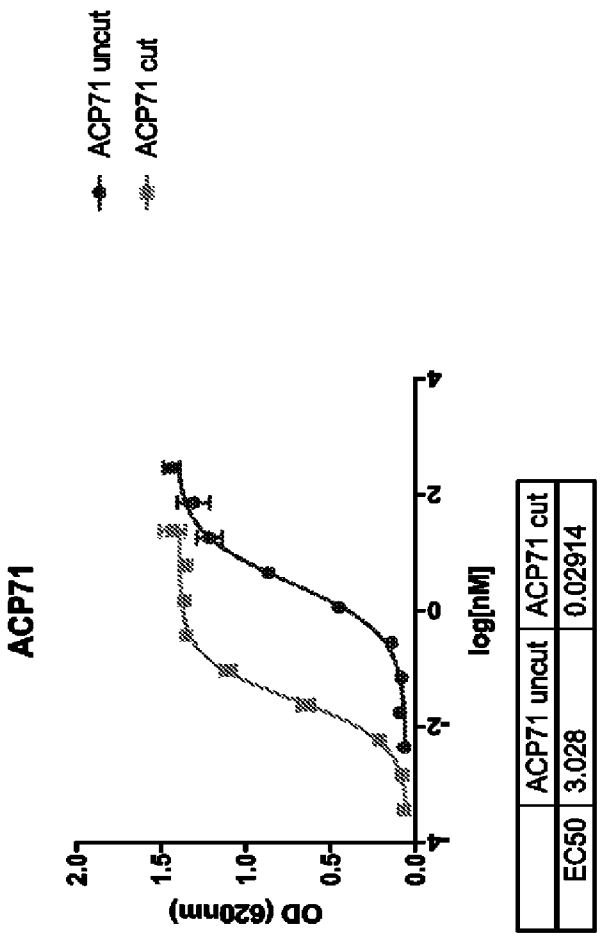

ACP71 uncut
ACP71 cut
ACP71
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
4
log[nM]
ACP71 uncut
ACP71 cut
EC50
3.028
0.02914

FIG. 28J

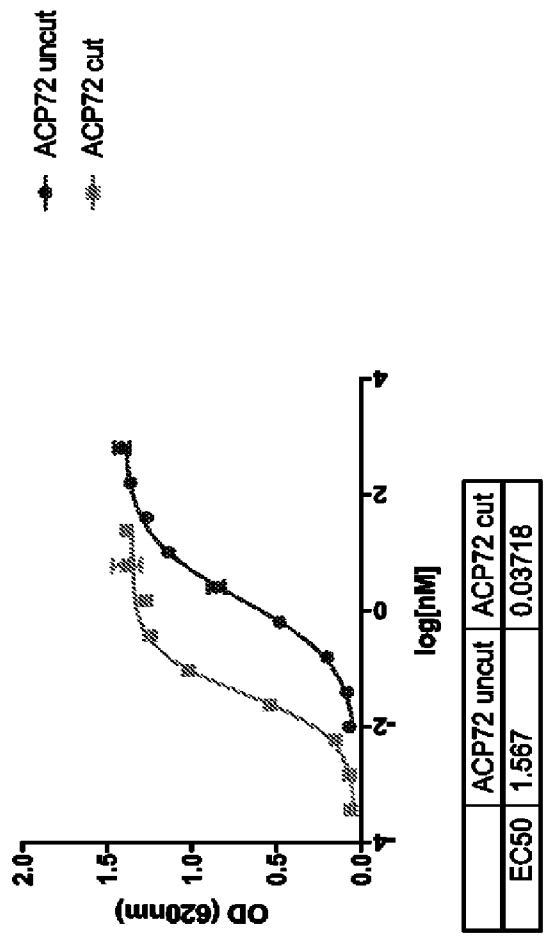

ACP72 uncut
ACP72 cut
ACP72
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
4
log[nM]
ACP72 uncut
ACP72 cut
EC50
1.567
0.03718

FIG. 28K

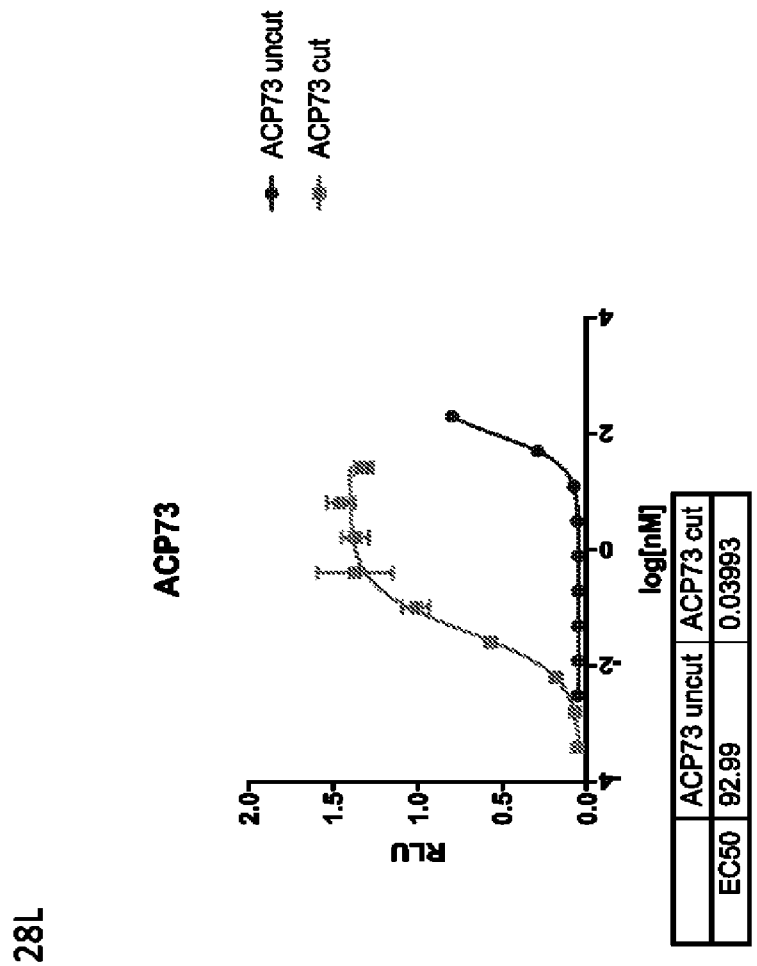
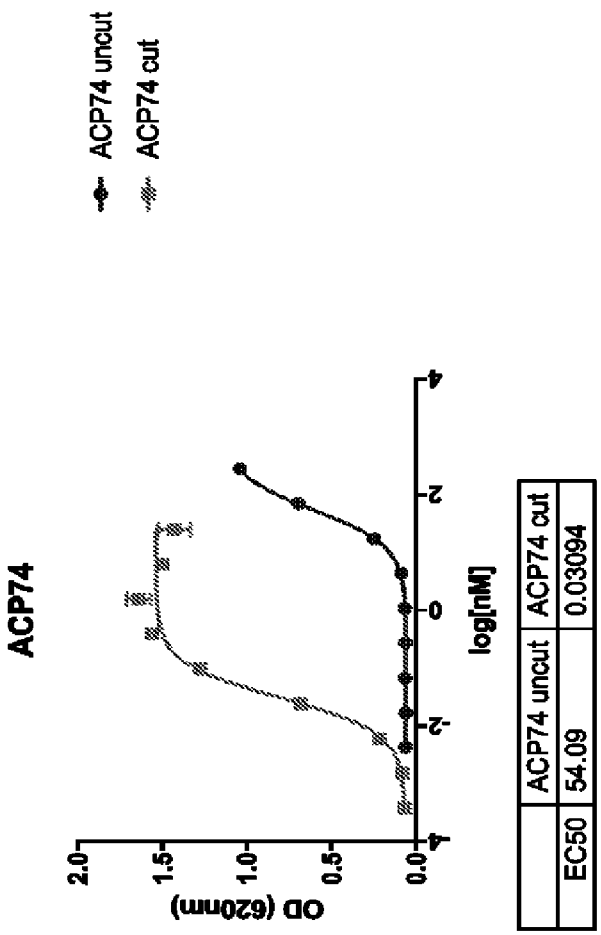

ACP73
ACP73 uncut
ACP73 cut
RLU
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
4
log[nM]
ACP73 uncut
ACP73 cut
EC50
92.99
0.03993

FIG. 28L

FIG. 28M



	ACP74 uncut	ACP74 cut
EC50	54.09	0.03094

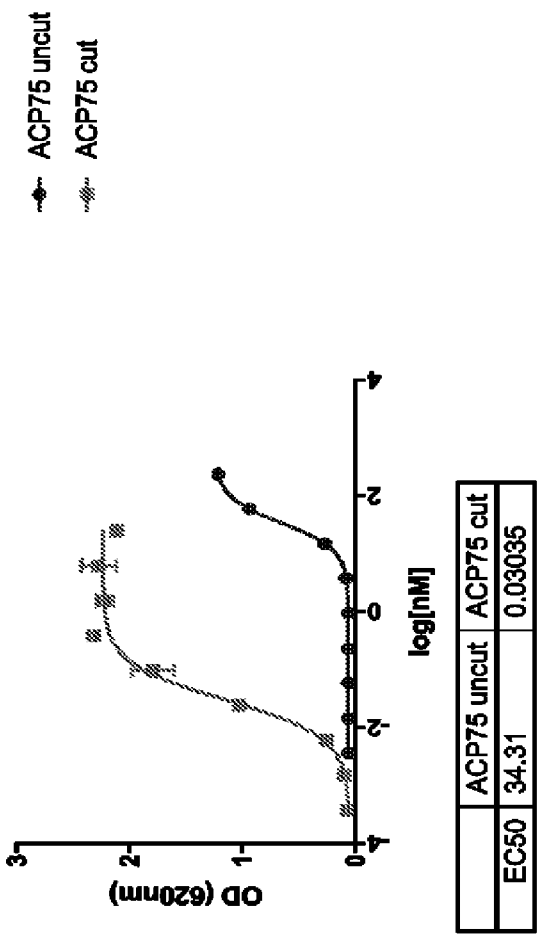

ACP75 uncut
ACP75 cut
ACP75
OD (620nm)
log[nM]
EC50
ACP75 uncut
34.31
ACP75 cut
0.03035

FIG. 28N

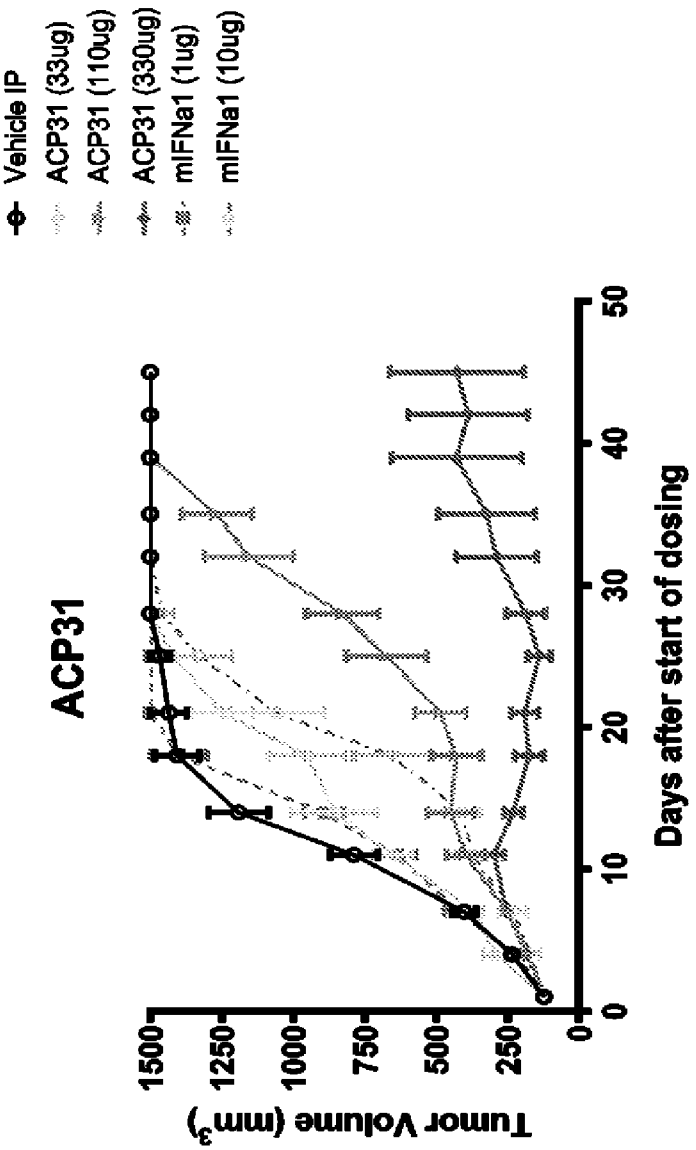

Vehicle IP
ACP31 (33ug)
ACP31 (110ug)
ACP31 (330ug)
mIFNa1 (1ug)
mIFNa1 (10ug)
ACP31
Tumor Volume (mm3)
1500
1250
1000
750
500
250
0
0
10
20
30
40
50
Days after start of dosing

FIG. 29A

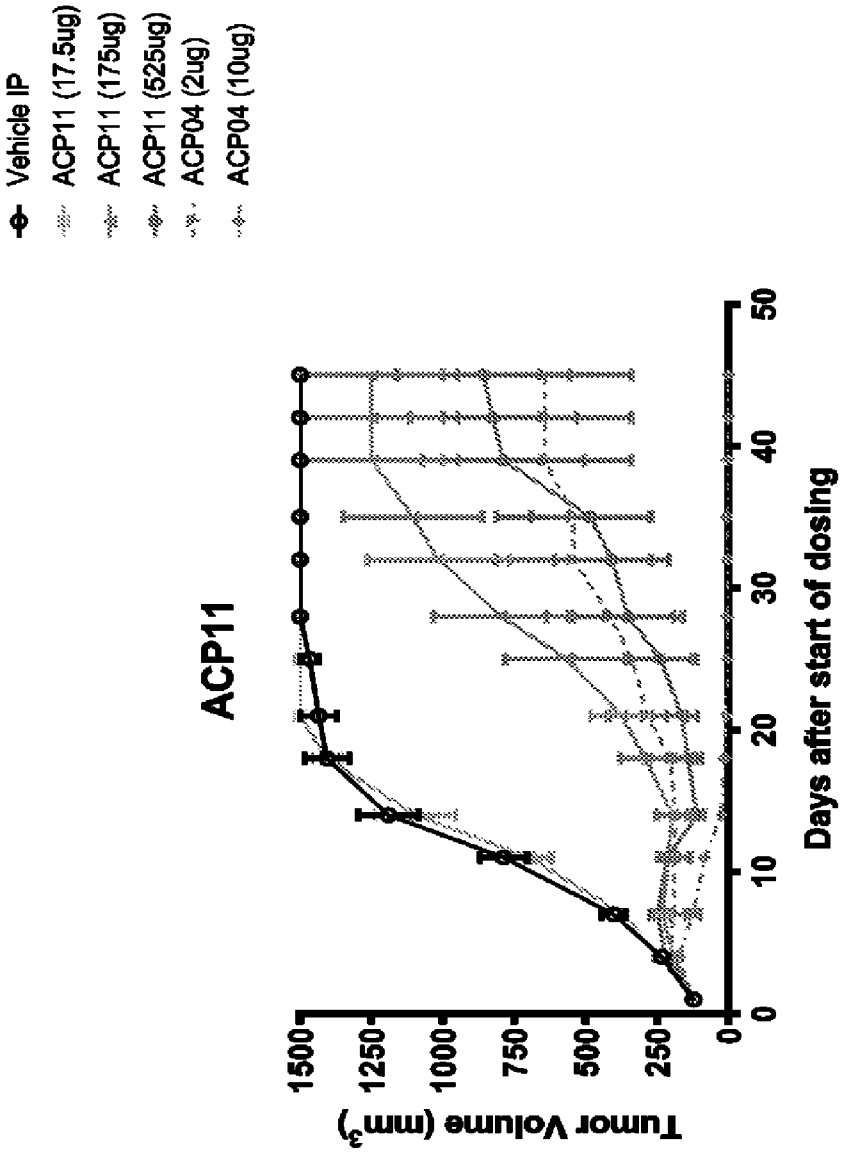

Vehicle IP
ACP11 (17.5ug)
ACP11 (175ug)
ACP11 (525ug)
ACP04 (2ug)
ACP04 (10ug)
ACP11
Tumor Volume (mm3)
1500
1250
1000
750
500
250
0
0
10
20
30
40
50
Days after start of dosing

FIG. 29B

FIG. 30

FIG. 30A

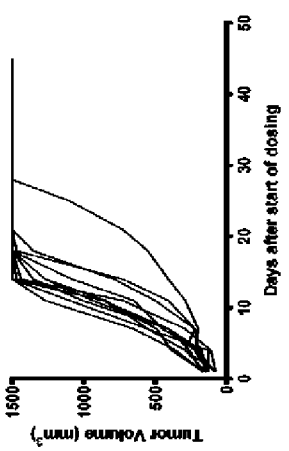


FIG. 30B

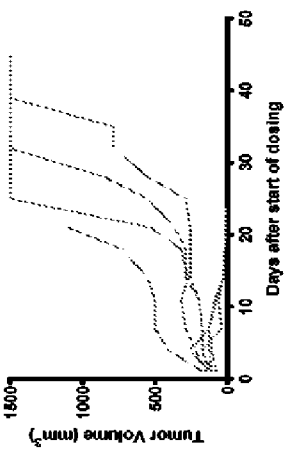


FIG. 30C

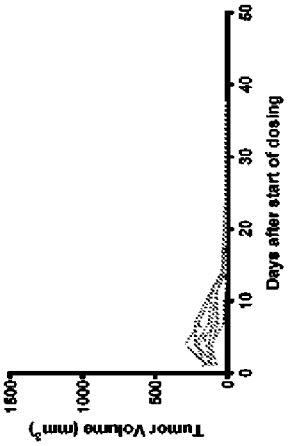


FIG. 30D

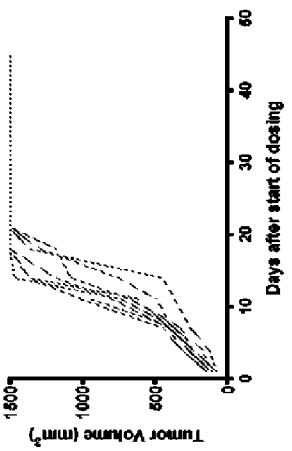


FIG. 30E

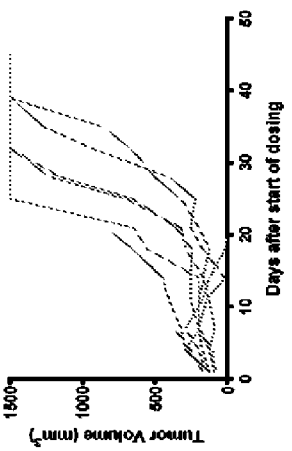
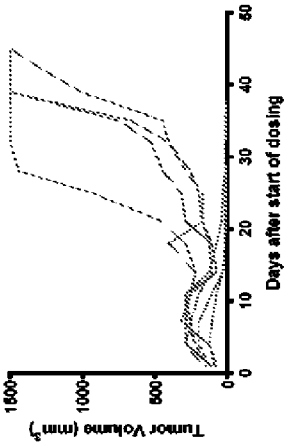


FIG. 30F



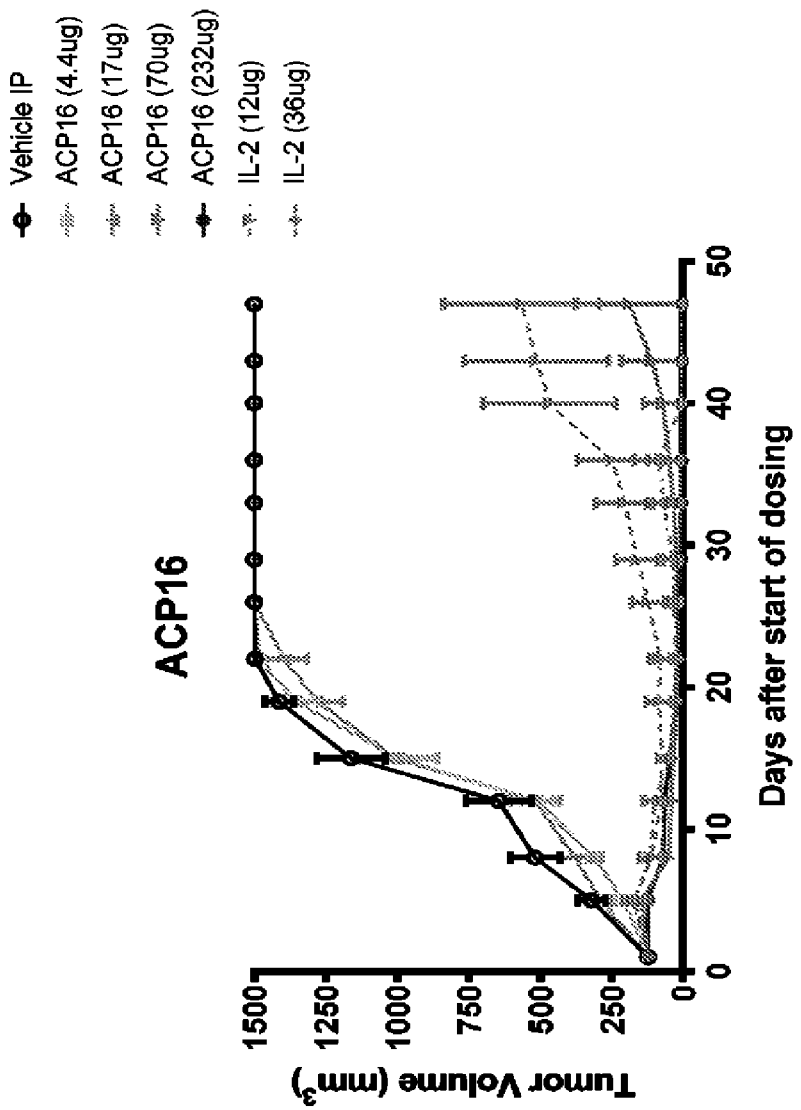

Vehicle IP
ACP16 (4.4ug)
ACP16 (17ug)
ACP16 (70ug)
ACP16 (232ug)
IL-2 (12ug)
IL-2 (36ug)
ACP16
Tumor Volume (mm3)
1500
1250
1000
750
500
250
0
0
10
20
30
40
50
Days after start of dosing

FIG. 31A

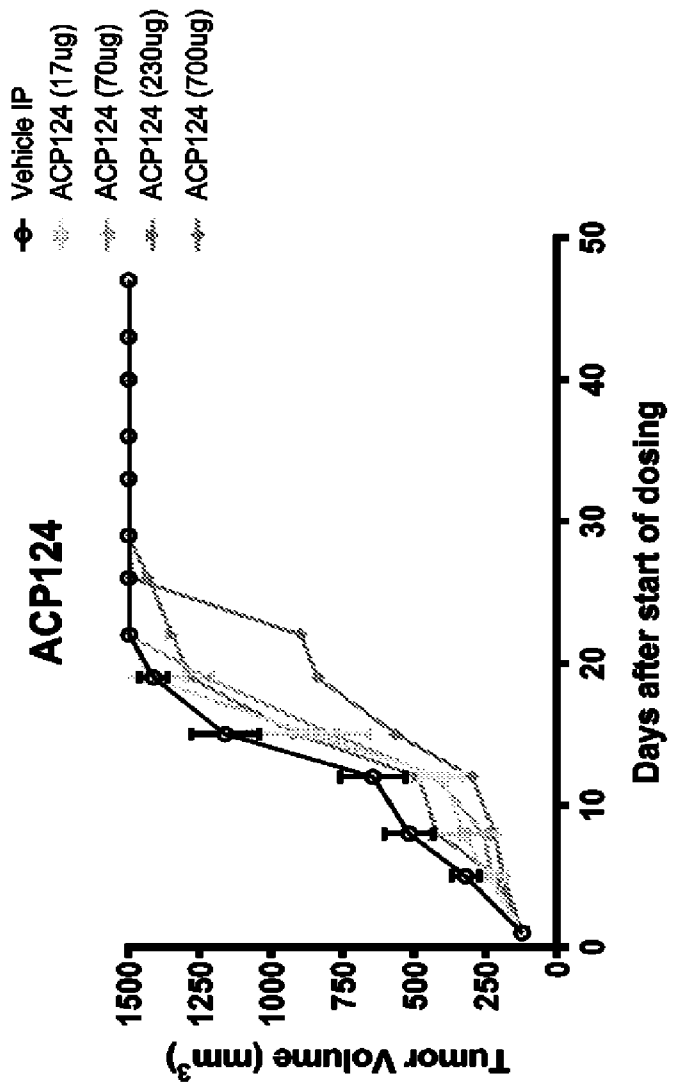

ACP124
Vehicle IP
ACP124 (17ug)
ACP124 (70ug)
ACP124 (230ug)
ACP124 (700ug)
Tumor Volume (mm3)
1500
1250
1000
750
500
250
0
0
10
20
30
40
50
Days after start of dosing

FIG. 31B

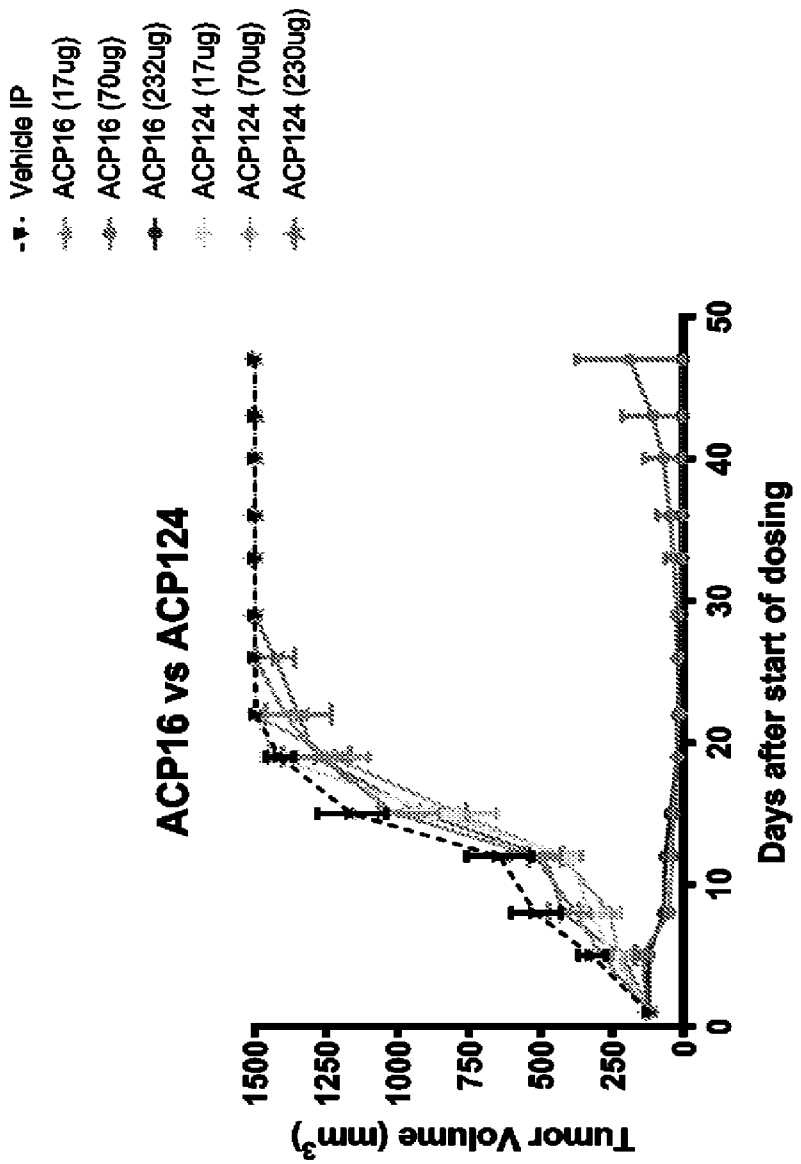

ACP16 vs ACP124
Vehicle IP
ACP16 (17ug)
ACP16 (70ug)
ACP16 (232ug)
ACP124 (17ug)
ACP124 (70ug)
ACP124 (230ug)
Tumor Volume (mm3)
1500
1250
1000
750
500
250
0
0
10
20
30
40
50
Days after start of dosing

FIG. 31C

FIG. 32A

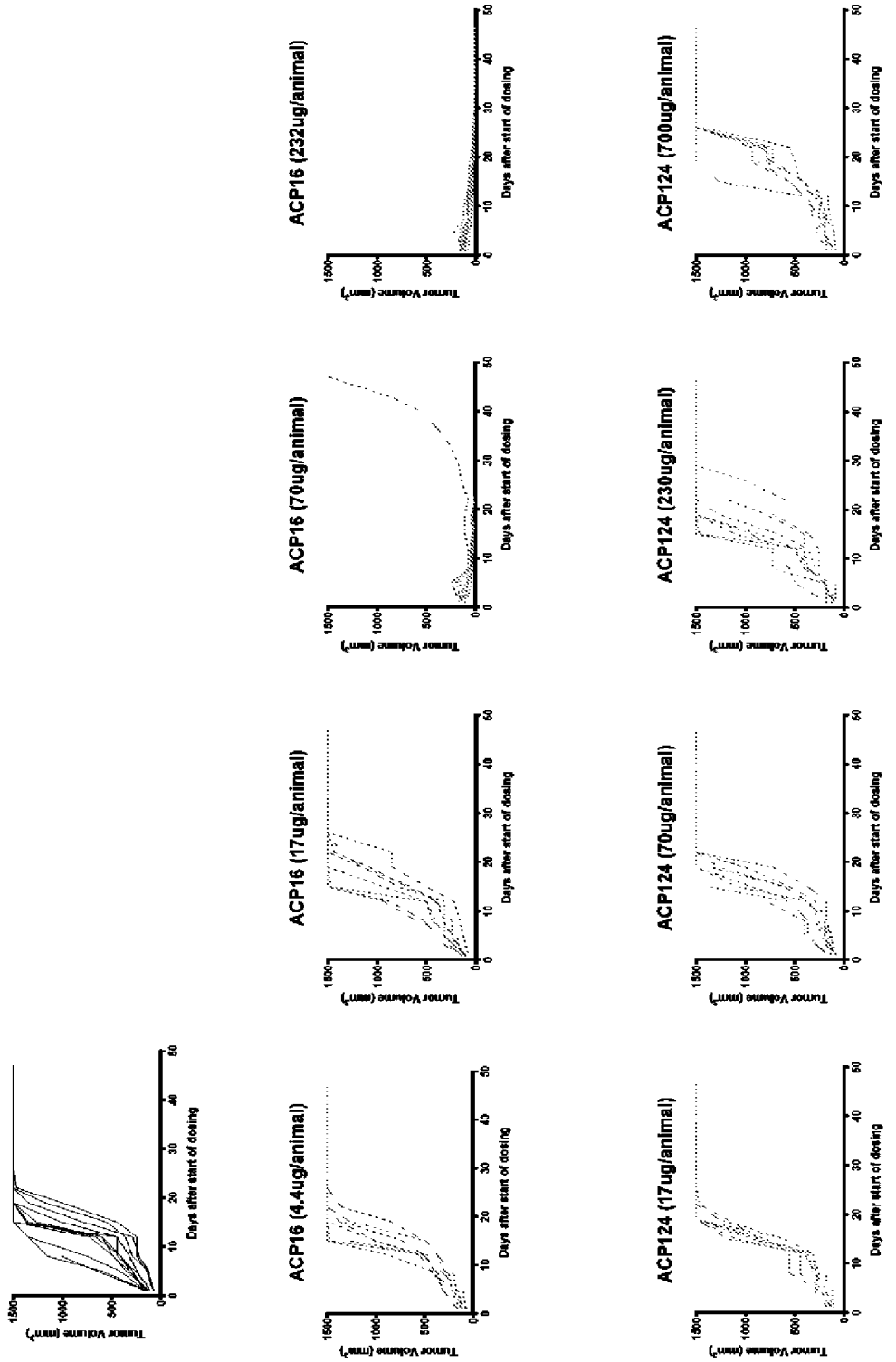
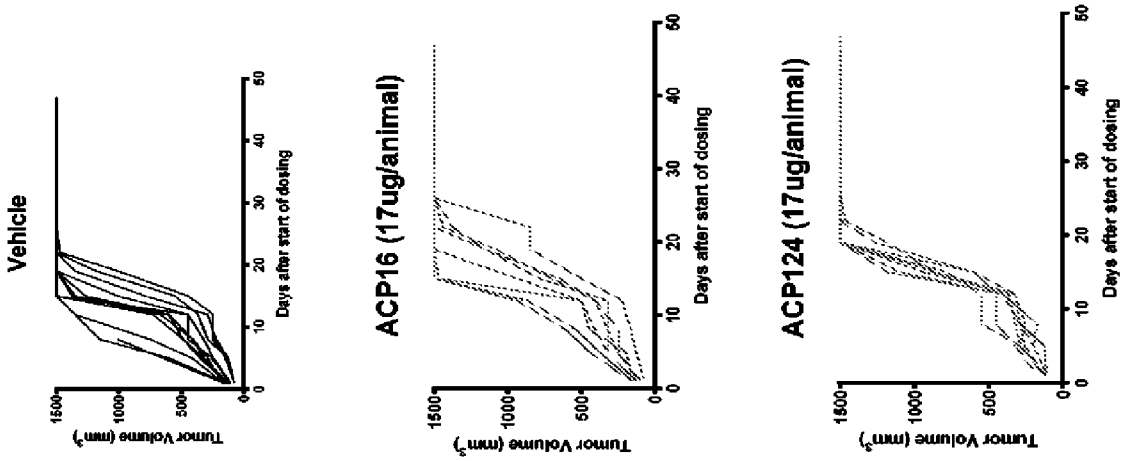

Vehicle
ACP16 (4.4ug/animal)
ACP16 (17ug/animal)
ACP16 (70ug/animal)
ACP16 (232ug/animal)
ACP124 (17ug/animal)
ACP124 (70ug/animal)
ACP124 (230ug/animal)
ACP124 (700ug/animal)
Tumor Volume (mm³)
Days after start of dosing

FIG. 32B


Vehicle
ACP16 (232ug/animal)
ACP16 (70ug/animal)
ACP124 (230ug/animal)
ACP16 (17ug/animal)
ACP124 (70ug/animal)
ACP124 (17ug/animal)
Tumor Volume (mm³)
Days after start of dosing
0
500
1000
1500
0
10
20
30
40
50
60

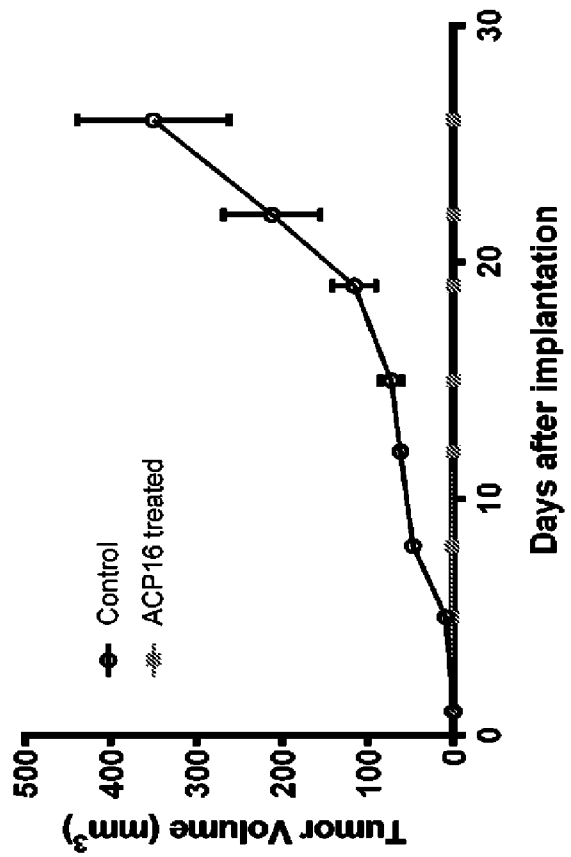

Tumor Growth
Control
ACP16 treated
Tumor Volume (mm³)
0
100
200
300
400
500
0
10
20
30
Days after implantation

FIG. 33

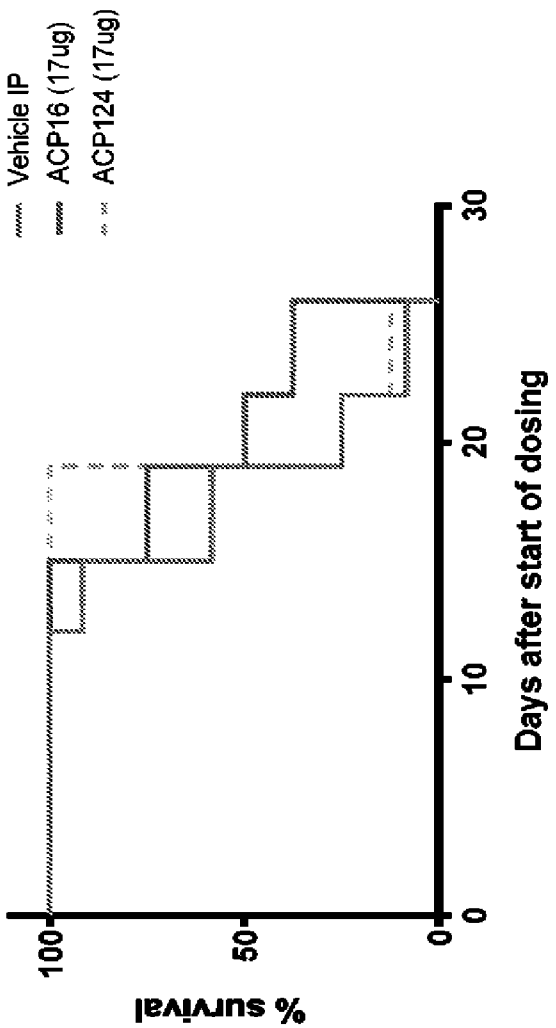

Vehicle IP
ACP16 (17ug)
ACP124 (17ug)
% survival
100
50
0
0
10
20
30
Days after start of dosing

FIG. 34A

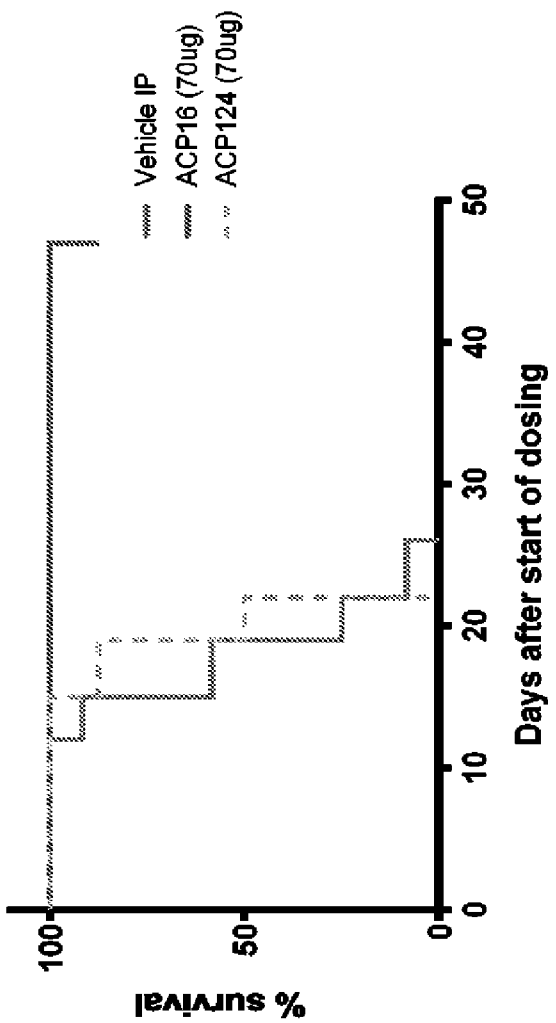

Vehicle IP
ACP16 (70ug)
ACP124 (70ug)
% survival
100
50
0
0
10
20
30
40
50
Days after start of dosing

FIG. 34B

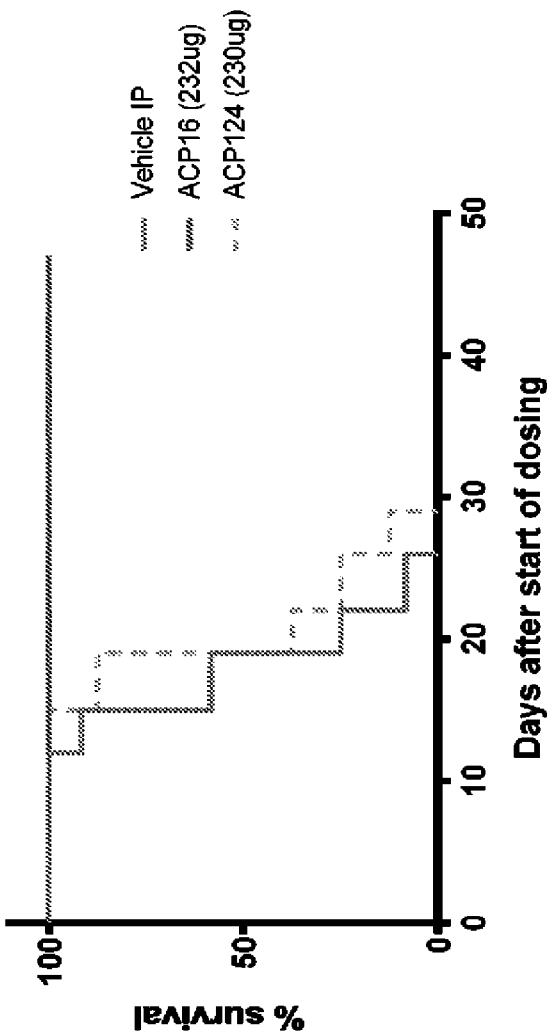

Vehicle IP
ACP16 (232ug)
ACP124 (230ug)
% survival
100
50
0
0
10
20
30
40
50
Days after start of dosing

FIG. 34C

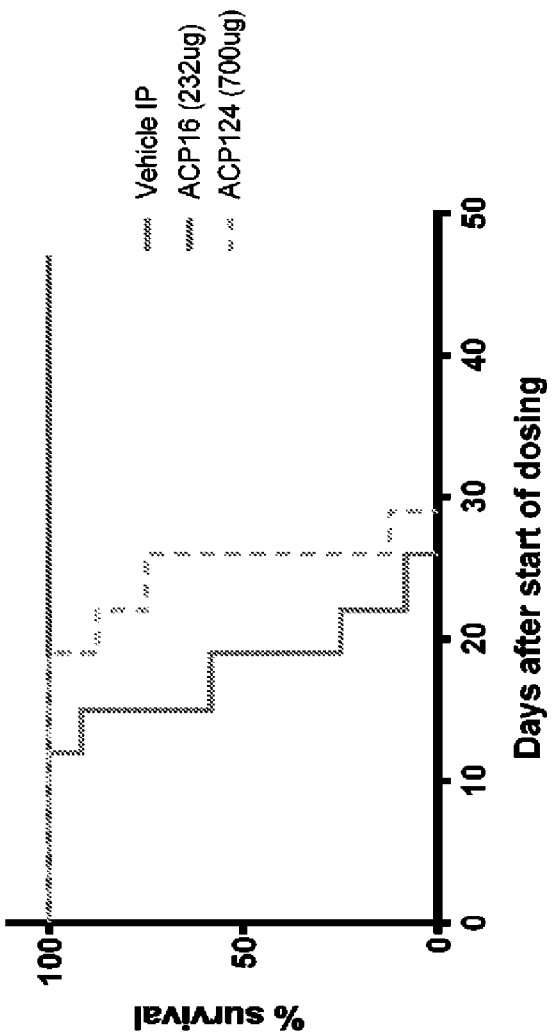

Vehicle IP
ACP16 (232ug)
ACP124 (700ug)
% survival
100
50
0
0
10
20
30
40
50
Days after start of dosing

FIG. 34D

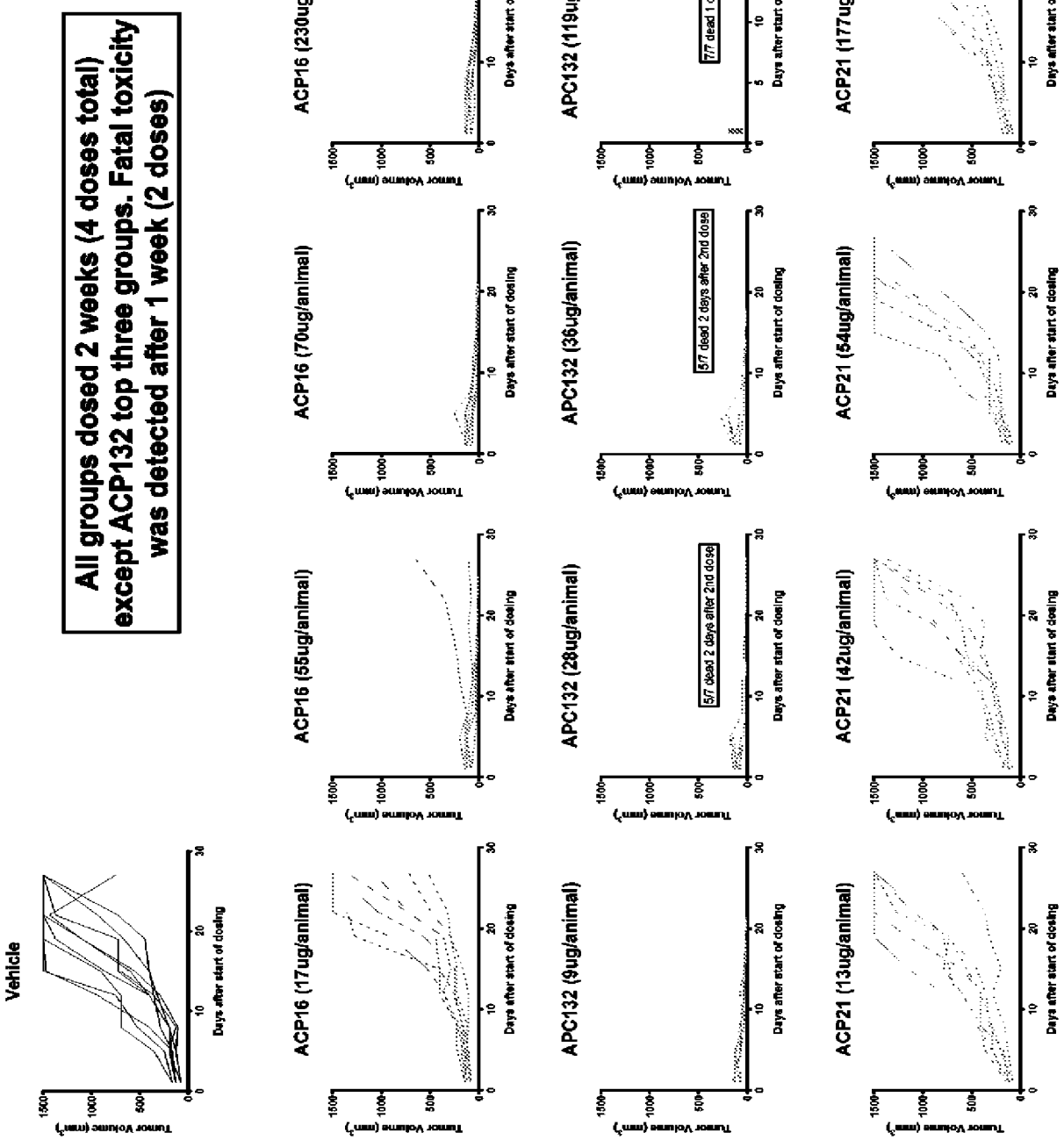
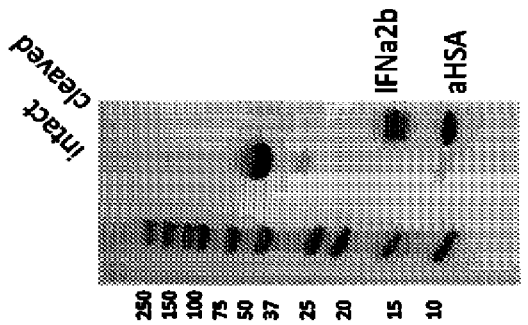

All groups dosed 2 weeks (4 doses total) except ACP132 top three groups. Fatal toxicity was detected after 1 week (2 doses)
Vehicle
ACP16 (17ug/animal)
ACP16 (55ug/animal)
ACP16 (70ug/animal)
ACP16 (230ug/animal)
APC132 (9ug/animal)
APC132 (28ug/animal)
5/7 dead 2 days after 2nd dose
APC132 (36ug/animal)
5/7 dead 2 days after 2nd dose
APC132 (119ug/animal)
7/7 dead 1 day after 2nd dose
ACP21 (13ug/animal)
ACP21 (42ug/animal)
ACP21 (54ug/animal)
ACP21 (177ug/animal)
Tumor Volume (mm³)
Days after start of dosing

FIG. 35



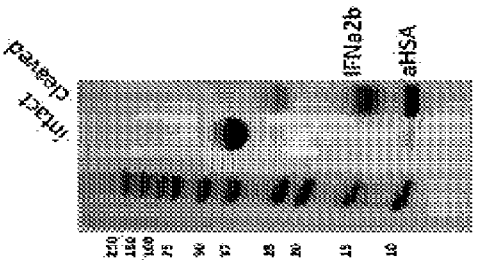
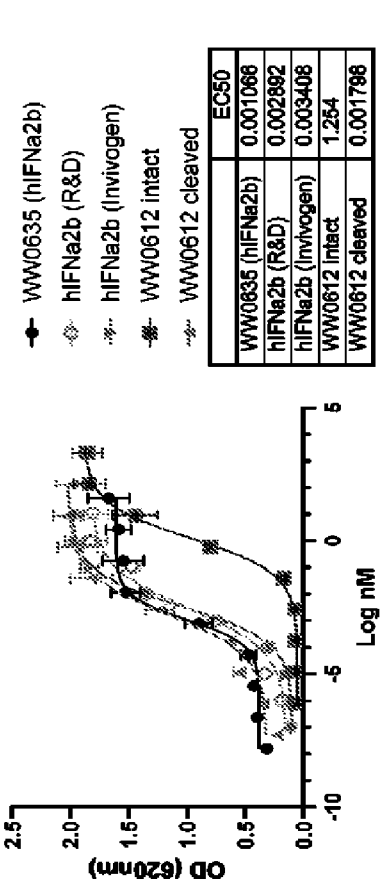
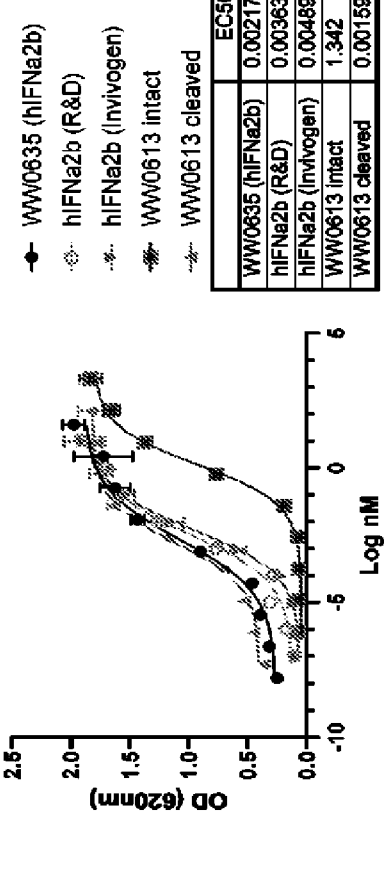


FIG. 36A

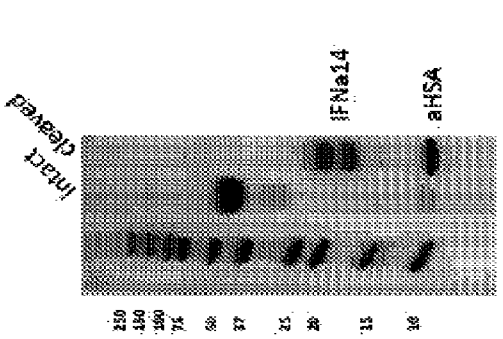


	EC50
WW0635 (hIFNa2b)	0.001066
hIFNa2b (R&D)	0.002892
hIFNa2b (Invivogen)	0.003408
WW0612 intact	1.254
WW0612 cleaved	0.001798

FIG. 36B



	EC50
WW0635 (hIFNa2b)	0.002171
hIFNa2b (R&D)	0.003637
hIFNa2b (Invivogen)	0.004893
WW0613 intact	1.342
WW0613 cleaved	0.001599



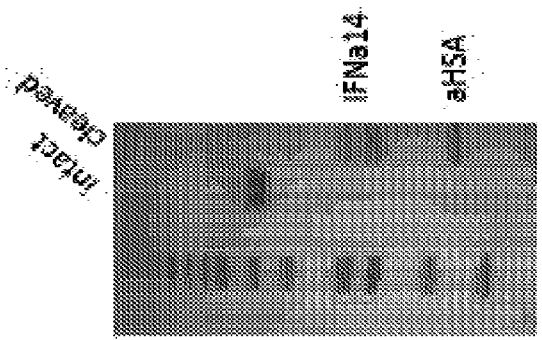
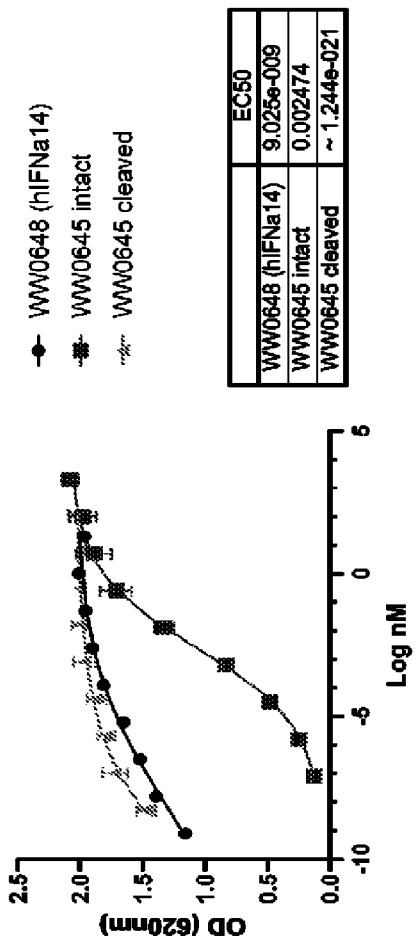
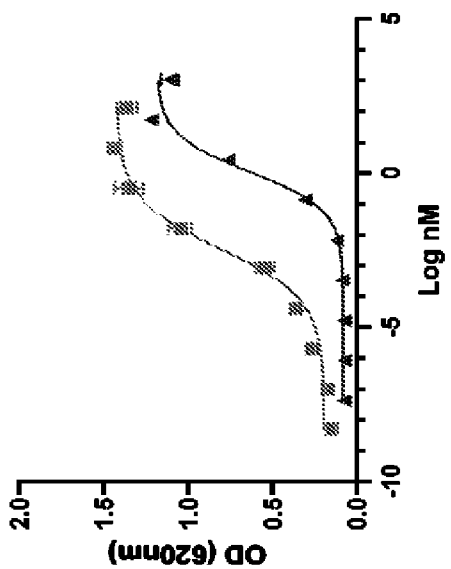


FIG. 36C



	EC50
WW0648 (hIFNa14)	9.025e-009
WW0645 intact	0.002474
WW0645 cleaved	~1.244e-021

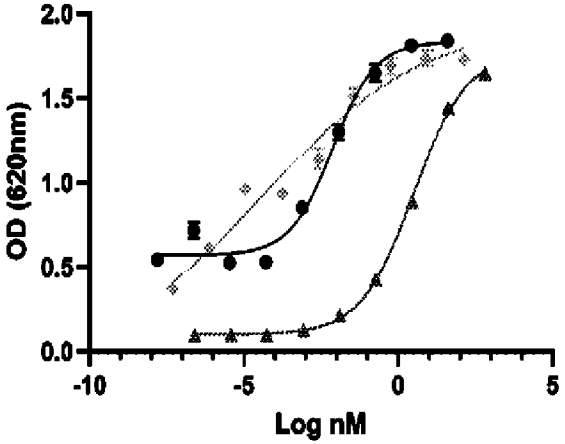
FIG. 36D



	EC50
WW0646 intact	1.101
WW0646 cleaved	0.003484

FIG. 36E

HEK-Blue hIFNa/b Reporter Assay Using WW0821



	EC50
WW0635 (hIFNa2b)	0.007553
WW0821 intact	3.183
WW0821 cleaved	5.519e-005

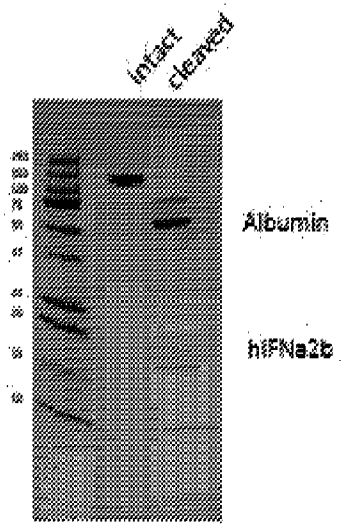
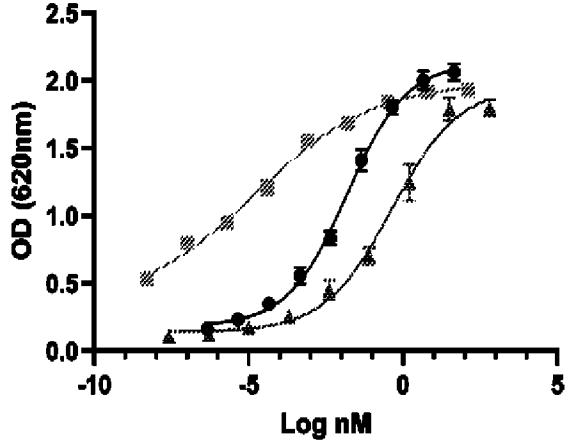


FIG. 36F

HEK-Blue hIFNa/b Reporter Assay Using WW0822



	EC50
rhIFNa14 (Invivogen)	0.01530
WW0822 intact	0.4337
WW0822 cleaved	1.595e-005
WW0822 CTSL cleaved	0.001199

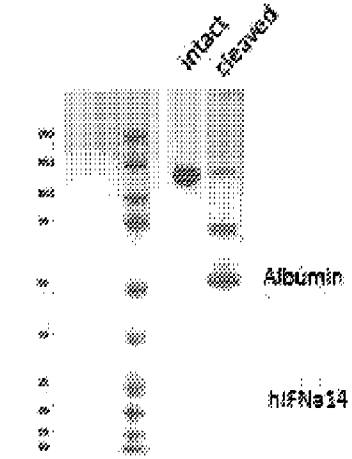
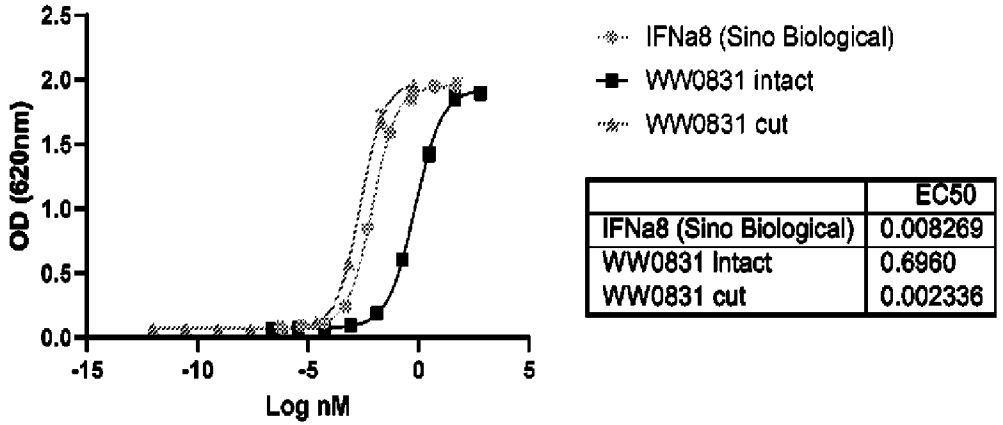


FIG. 36G



	EC50
IFNa8 (Sino Biological)	0.008269
WW0831 Intact	0.6960
WW0831 cut	0.002336

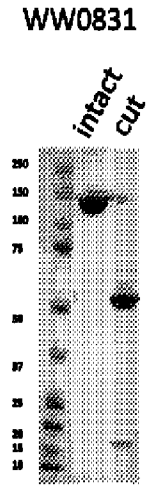
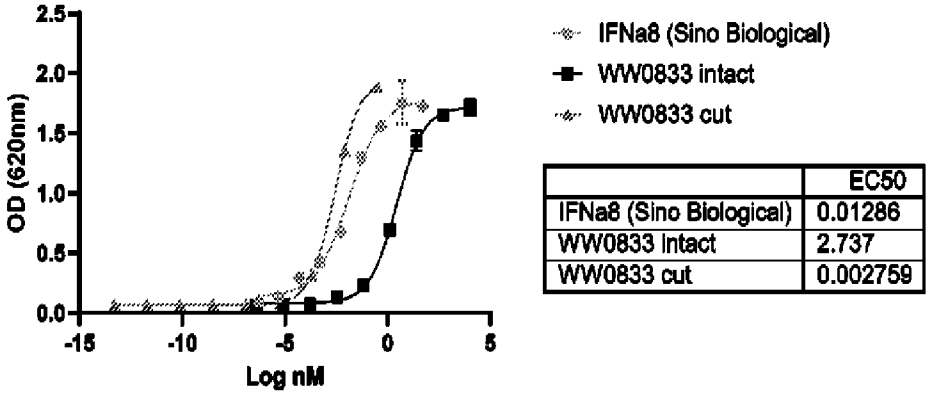


FIG. 36H



	EC50
IFNa8 (Sino Biological)	0.01286
WW0833 Intact	2.737
WW0833 cut	0.002759

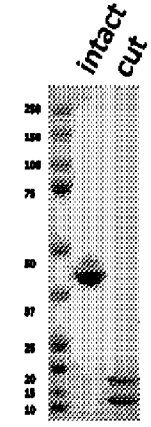
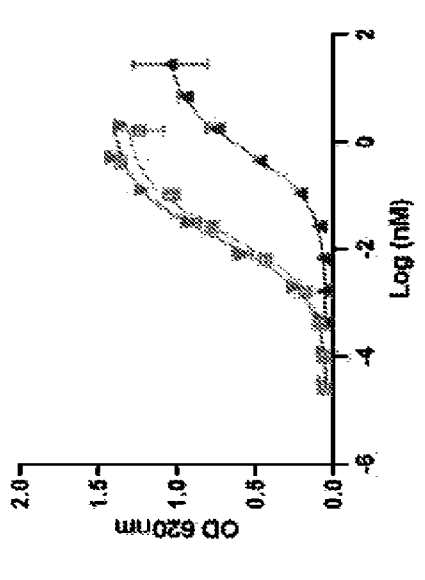


FIG. 37A

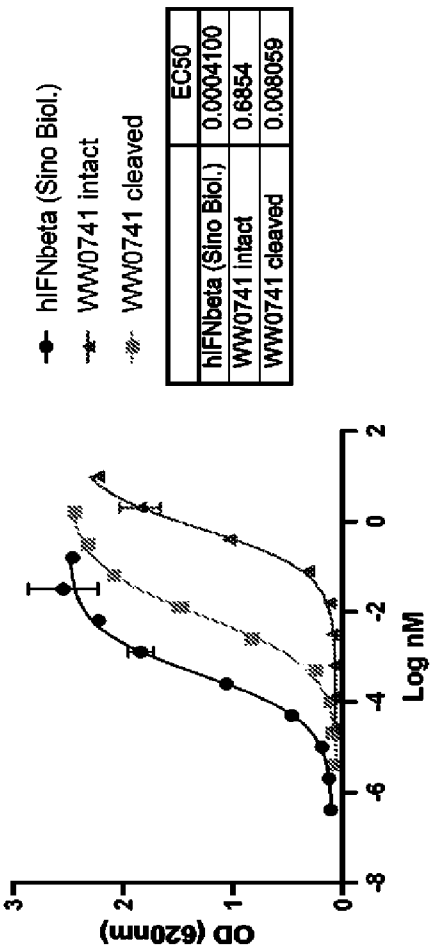


	EC50
Sino Biological mIFNbeta	0.01842
WW0737 intact	0.6664
WW0737 cleaved	0.01455

FIG. 37B

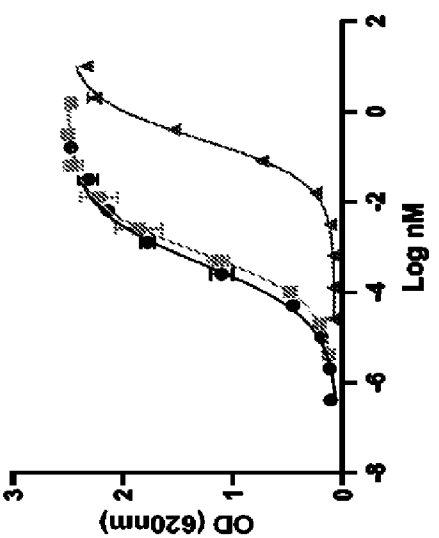
	EC50
Sino Biological mIFNbeta	0.02781
WW0739 intact	1.436
WW0739 cleaved	0.03685

FIG. 37C



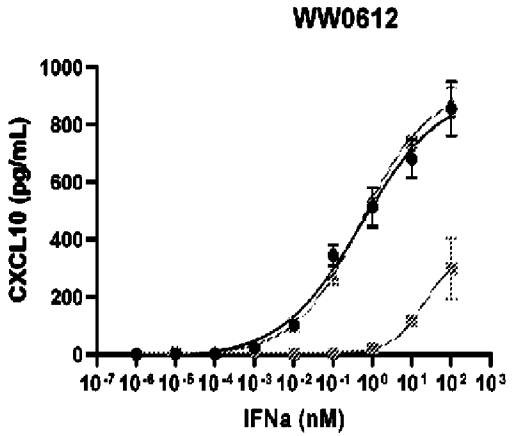
	EC50
hIFNbeta (Sino Biol.)	0.0004100
WW0741 intact	0.6854
WW0741 cleaved	0.008059

FIG. 37D



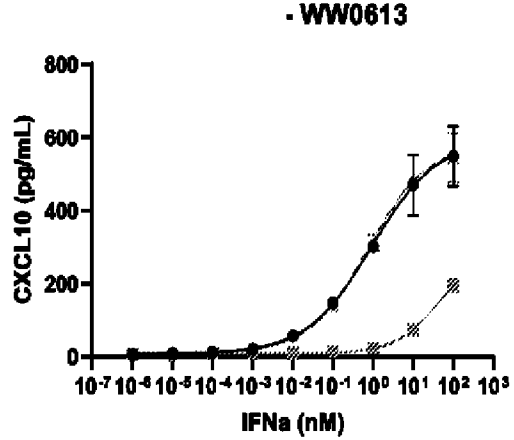
	EC50
hIFNbeta (Sino Biol.)	0.0004189
WW0743 intact	0.2435
WW0743 cleaved	0.0007304

FIG. 38A



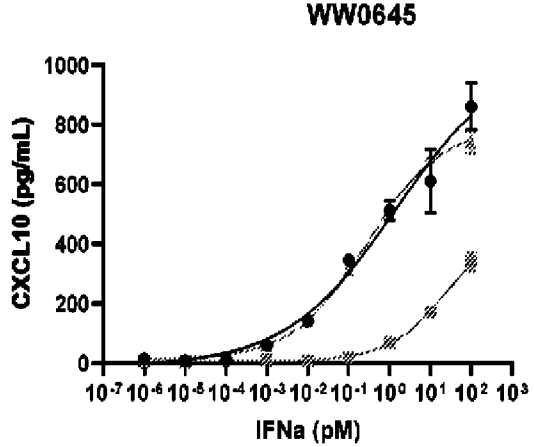
	WW0635	Intact WW0612	Cut WW0612
EC50	0.5252	21.63	0.5189

FIG. 38B



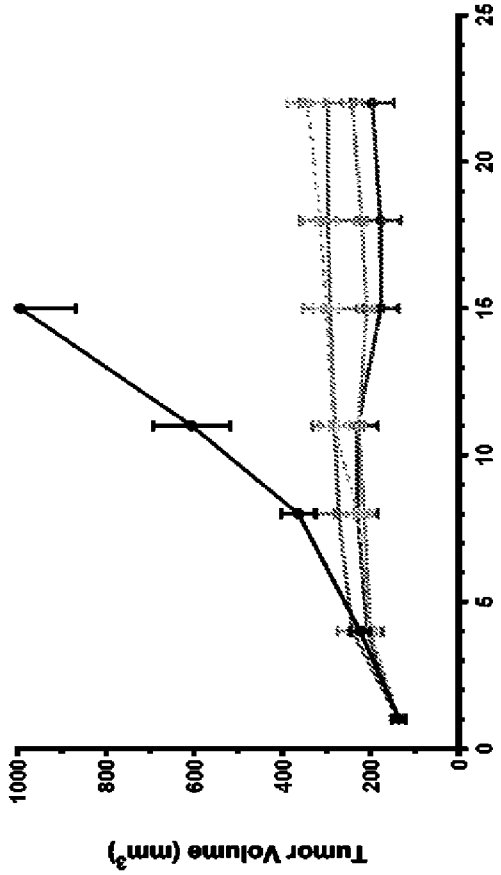
	WW0635	Intact WW0613	Cut WW0613
EC50	0.9388	63.63	0.7485

FIG. 38C



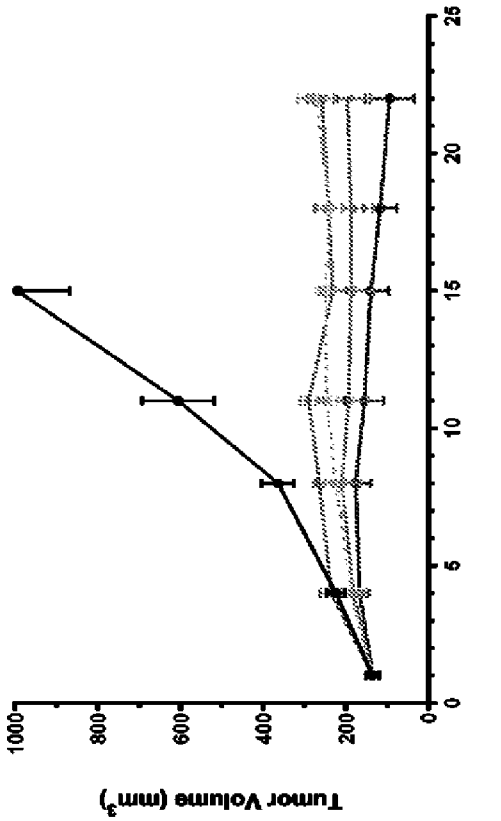
	WW0648	Intact WW0645	Cut WW0645
EC50	1.438	39.00	0.2899

FIG. 39A



Treatment	Dead	Day
610 (369 µg, x4)		
610 (553 µg, x4)	1	15
610 (830 µg, x4)		
610 (1,245 µg, x4)	1	22

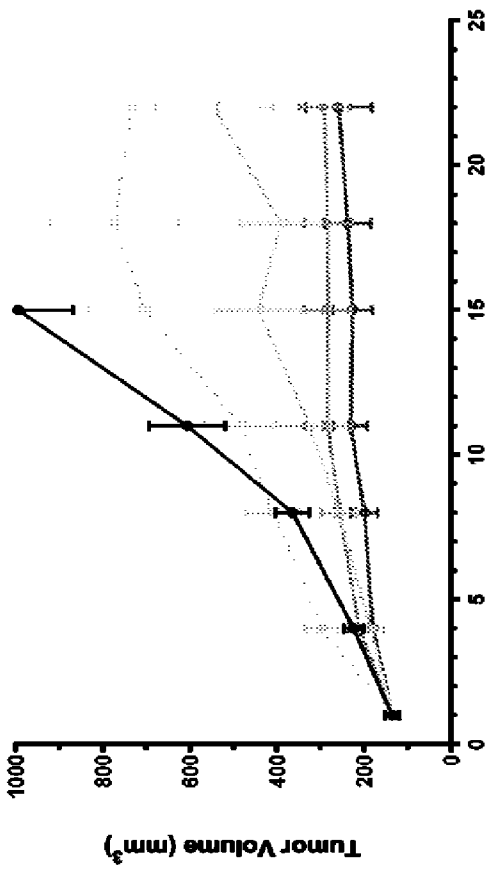
FIG. 39B



Treatment	Dead	Day
815 (1,231 µg, x4)		
815 (1,845 µg, x4)		
815 (2,770 µg, x4)	1	8
815 (4,154 µg, x4)	3	4, 22, 22

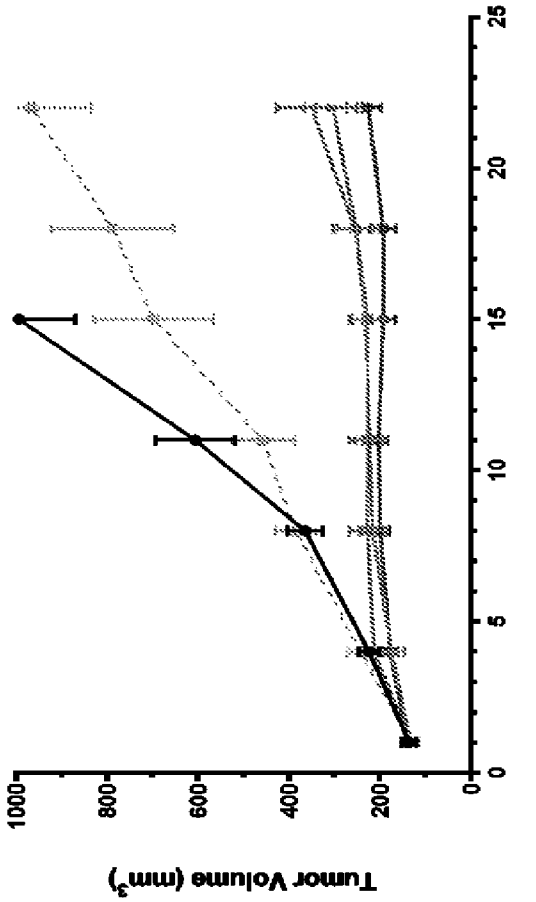
CA 03155981 2022-4-25

FIG. 39C



Treatment	Dead	Day
644 (4.6 µg, x4)		
644 (9.3 µg, x4)		
644 (19 µg, x4)		
644 (37 µg, x4)	3	15, 18, 22

FIG. 39D



Treatment	Dead	Day
816 (31 µg, x4)		
816 (62 µg, x4)		
816 (123 µg, x4)		
816 (247 µg, x4)	3	15, 22, 22

FIG. 39E

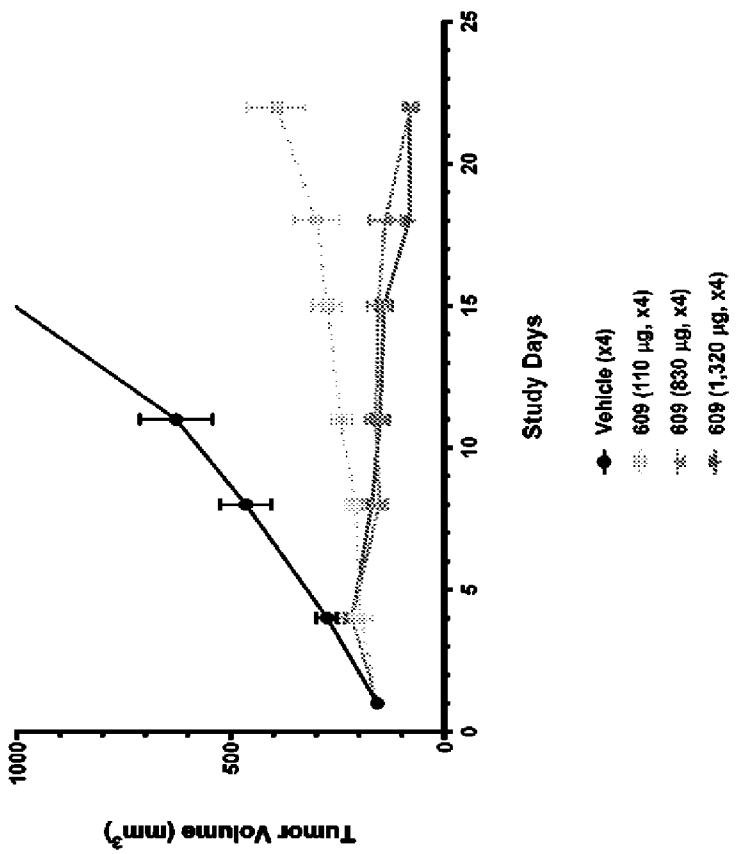
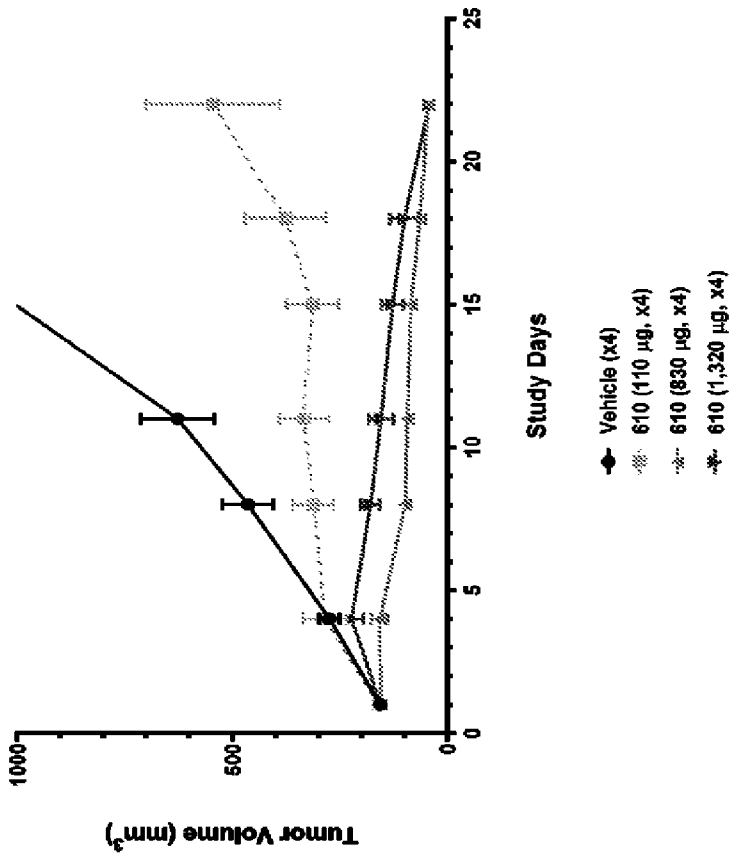


FIG. 39F



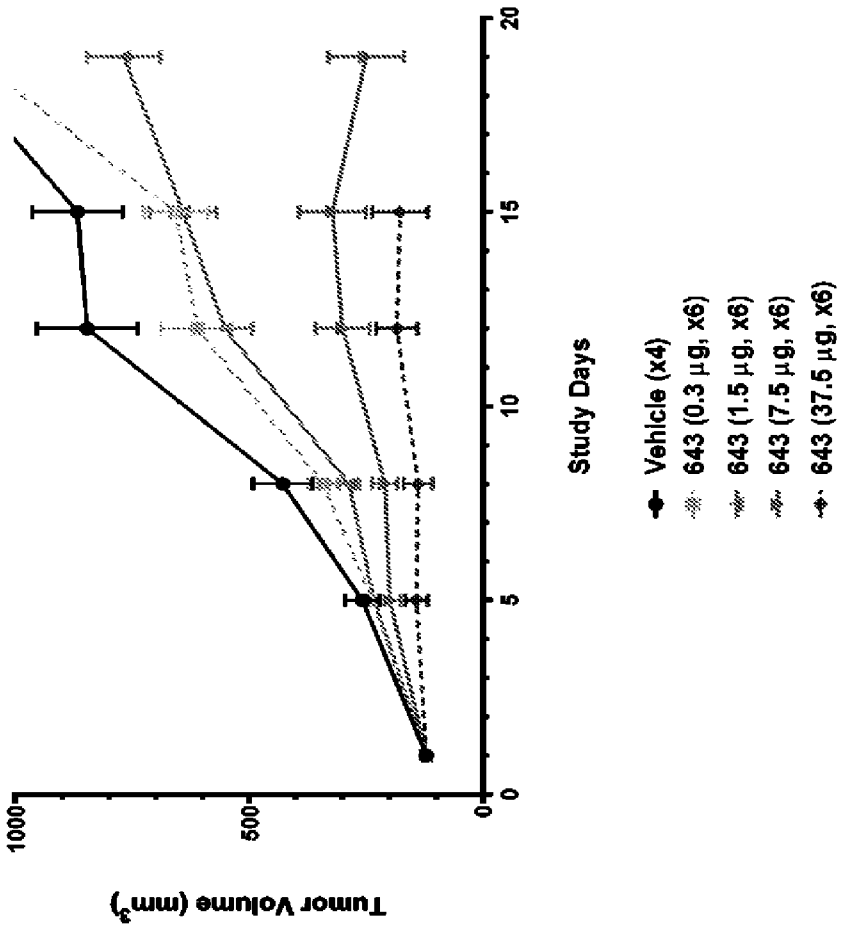

Tumor Volume (mm³)
1000
500
0
0
5
10
15
20
Study Days
Vehicle (x4)
643 (0.3 µg, x6)
643 (1.5 µg, x6)
643 (7.5 µg, x6)
643 (37.5 µg, x6)

FIG. 39G

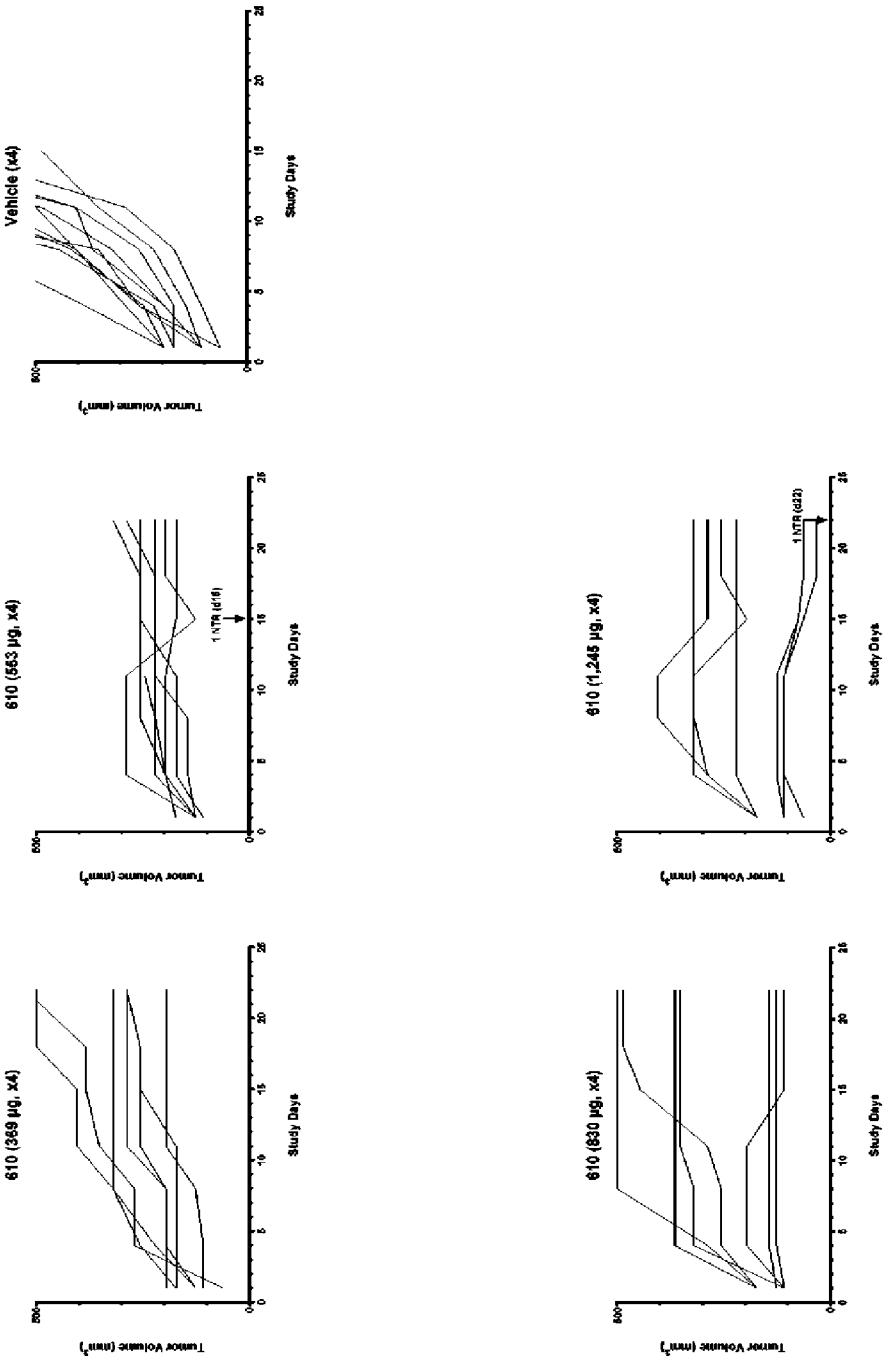

Vehicle (x4)
610 (369 µg, x4)
610 (553 µg, x4)
610 (830 µg, x4)
610 (1,245 µg, x4)
Tumor Volume (mm³)
Study Days
1 NTR (d16)
1 NTR (d22)

FIG. 40A

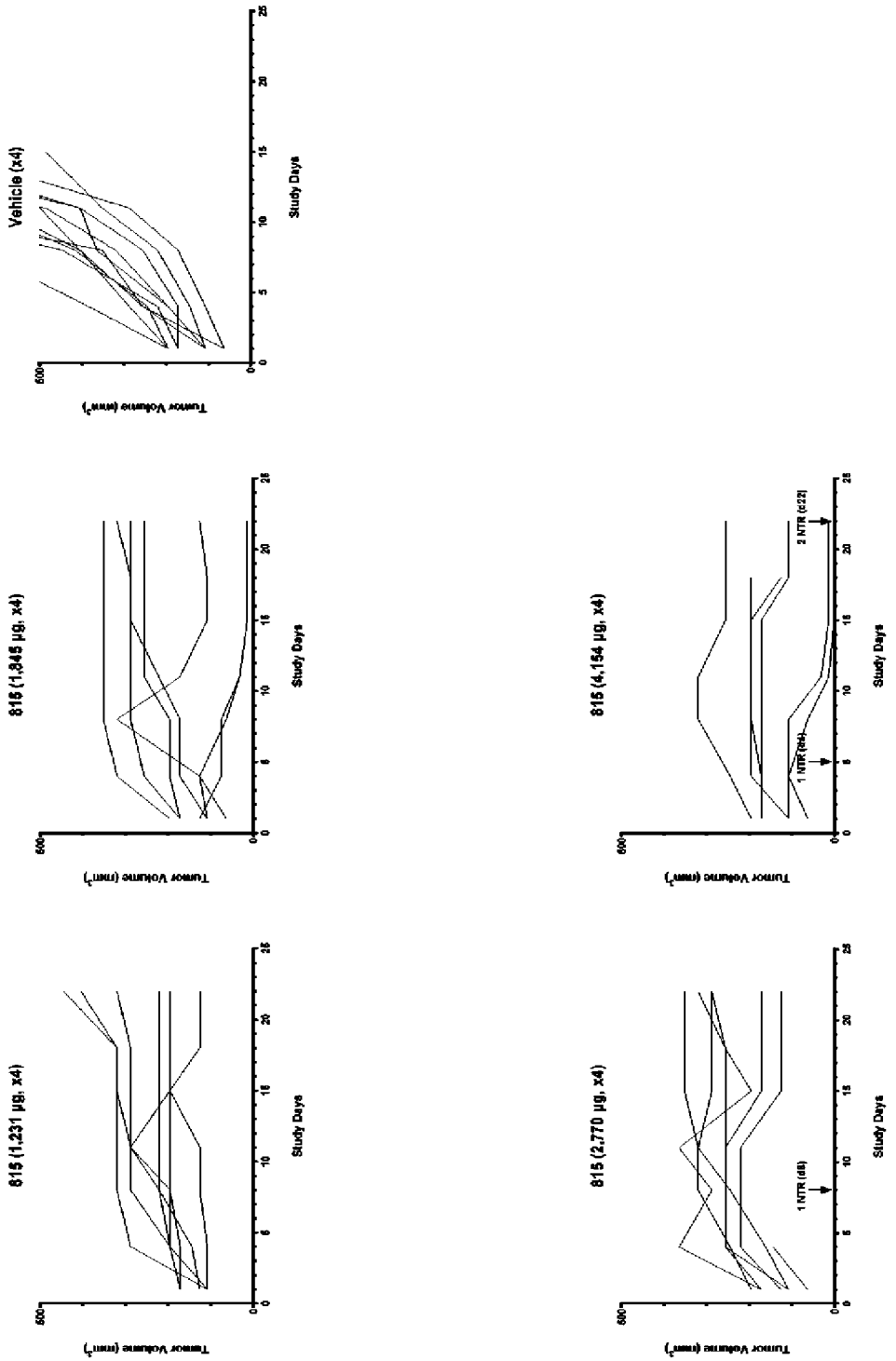

Vehicle (x4)
815 (1,845 µg, x4)
815 (4,154 µg, x4)
815 (1,231 µg, x4)
815 (2,770 µg, x4)
Tumor Volume (mm³)
Study Days
1 NTR (d4)
2 NTR (d22)

FIG. 40B

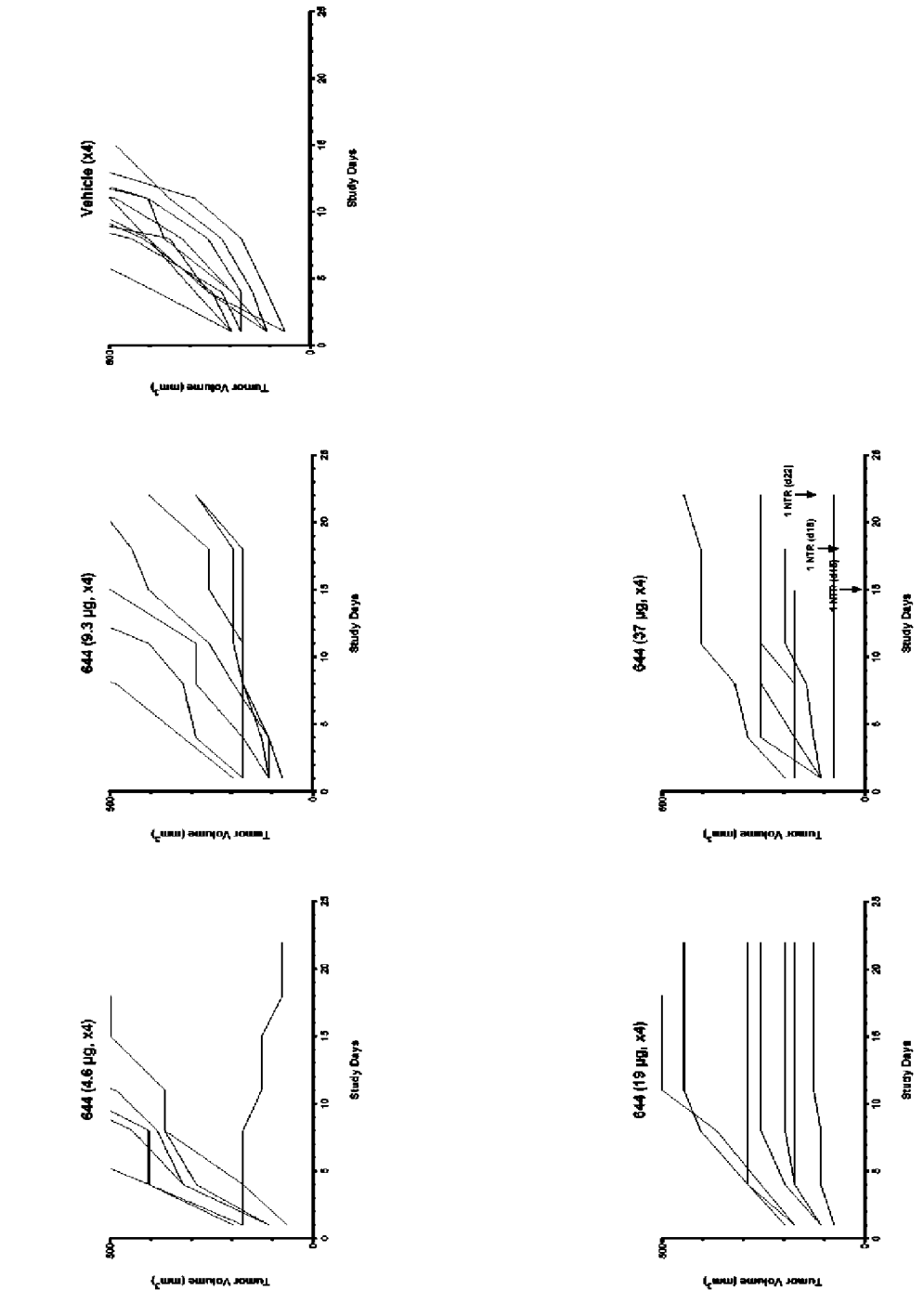

Vehicle (x4)
644 (4.6 µg, x4)
644 (9.3 µg, x4)
644 (19 µg, x4)
644 (37 µg, x4)
1 NTR (d22)
1 NTR (d18)
1 NTR (d14)
Tumor Volume (mm³)
Study Days

FIG. 40C

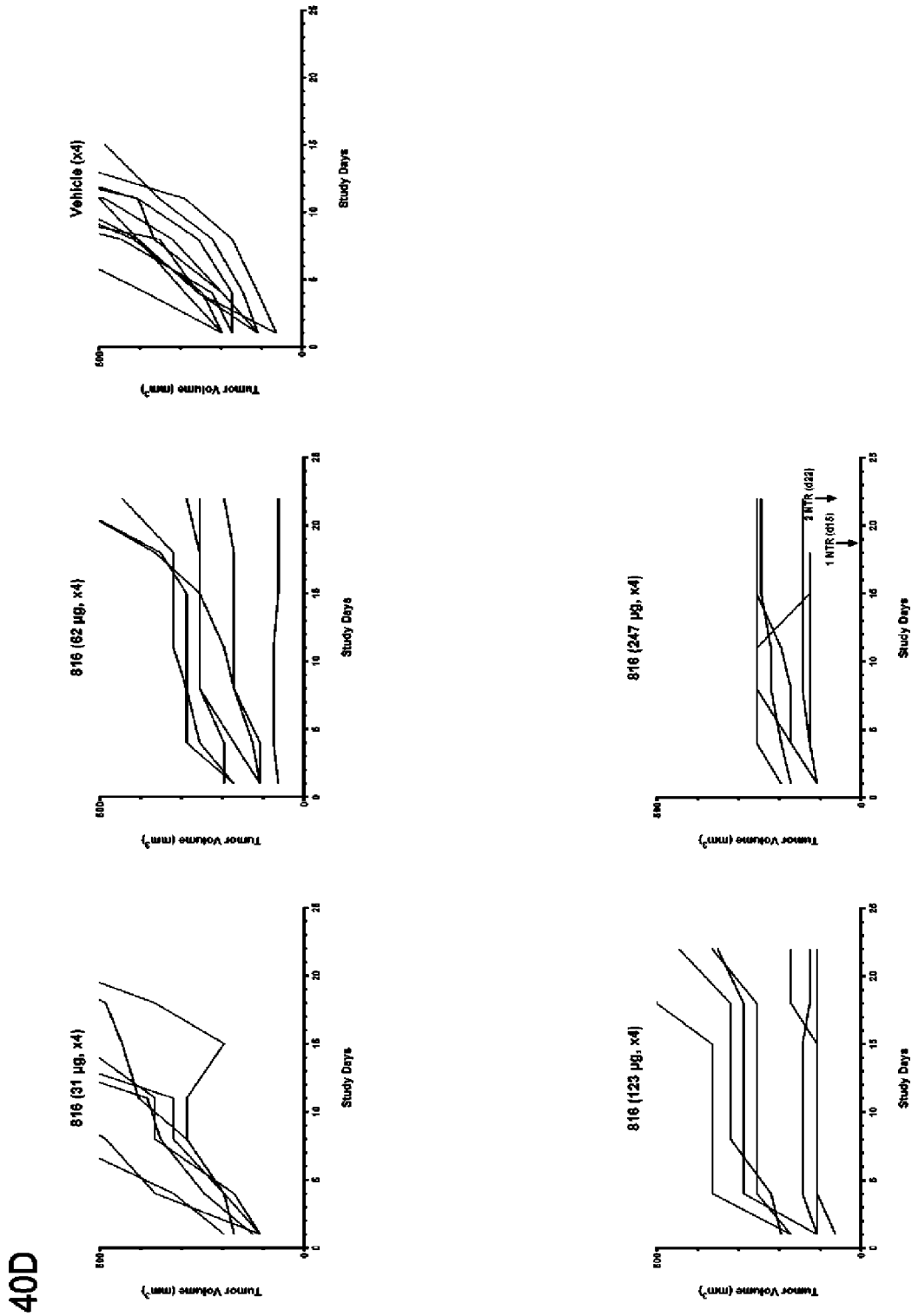

Vehicle (x4)
816 (31 µg, x4)
816 (62 µg, x4)
816 (123 µg, x4)
816 (247 µg, x4)
Tumor Volume (mm³)
Study Days
1 NTR (d15)
2 NTR (d22)

FIG. 40D

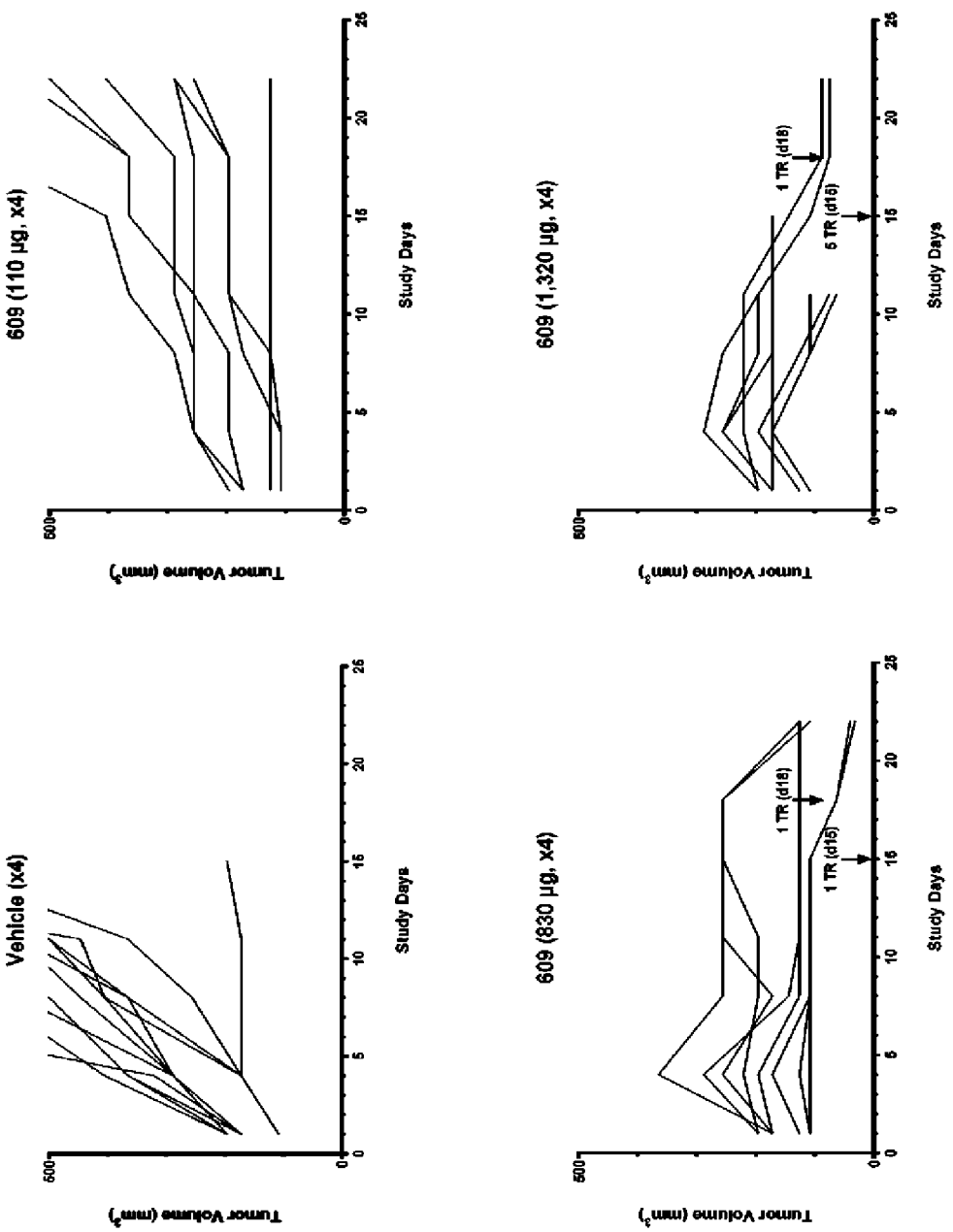

Vehicle (x4)
609 (110 µg, x4)
609 (830 µg, x4)
609 (1,320 µg, x4)
Tumor Volume (mm³)
Study Days
0
500
5
10
15
20
25
1 TR (d18)
1 TR (d15)
5 TR (d15)

FIG. 40E

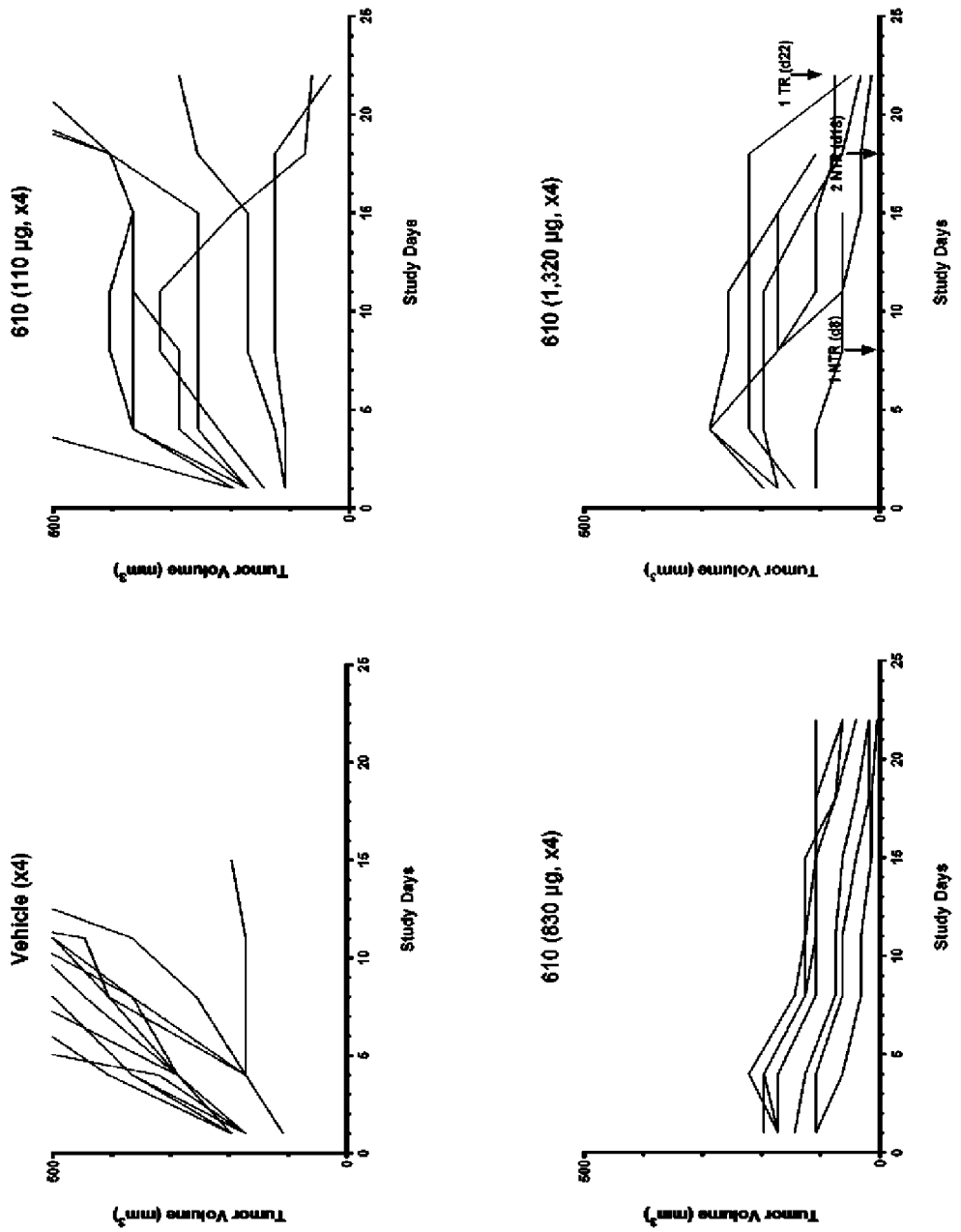

610 (110 µg, x4)
610 (1,320 µg, x4)
Vehicle (x4)
610 (830 µg, x4)
Tumor Volume (mm³)
Study Days
1 TR (d22)
2 NTR (d16)
1 NTR (d8)
0
5
10
15
20
25
500
600

FIG. 40F

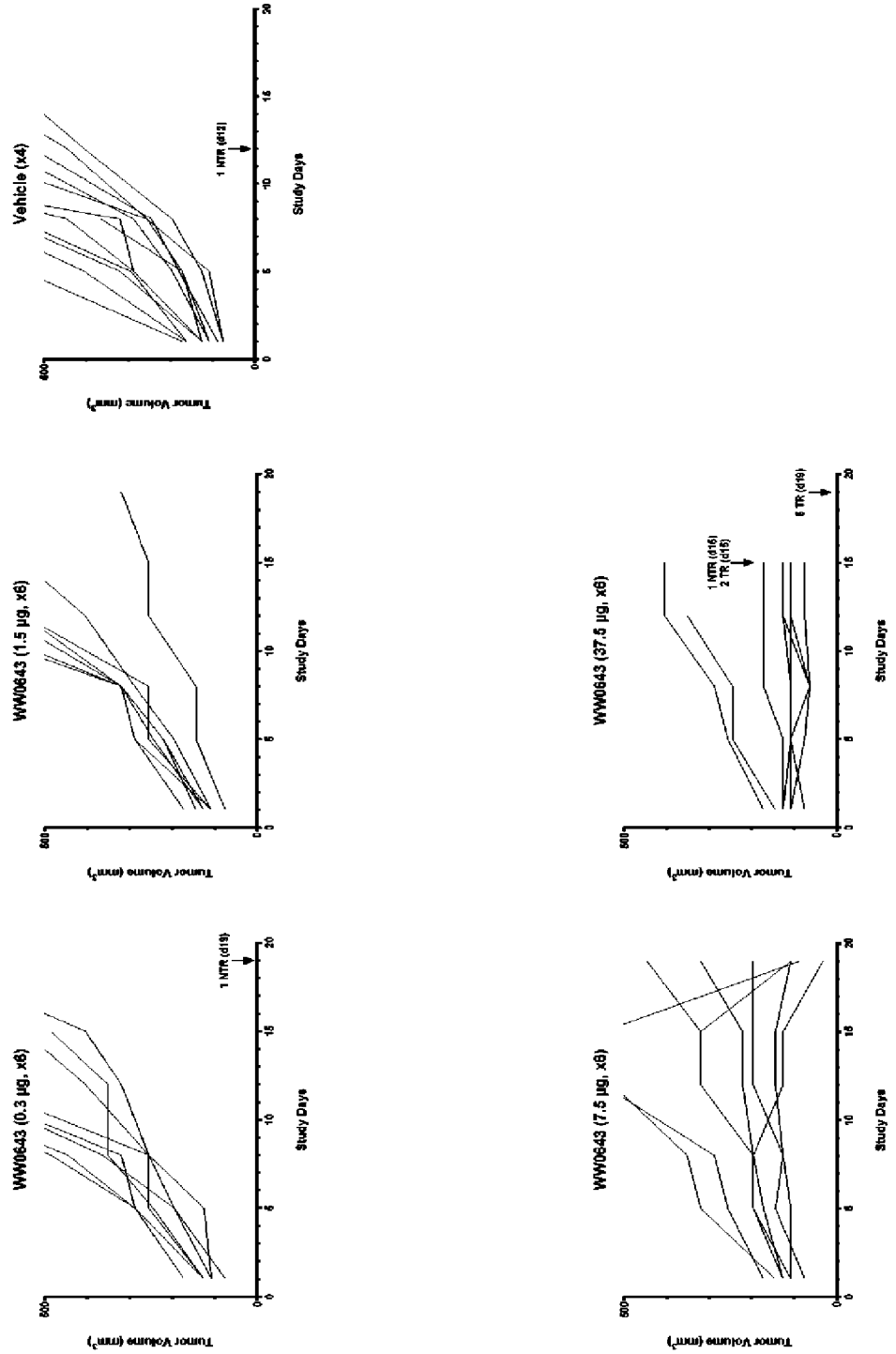
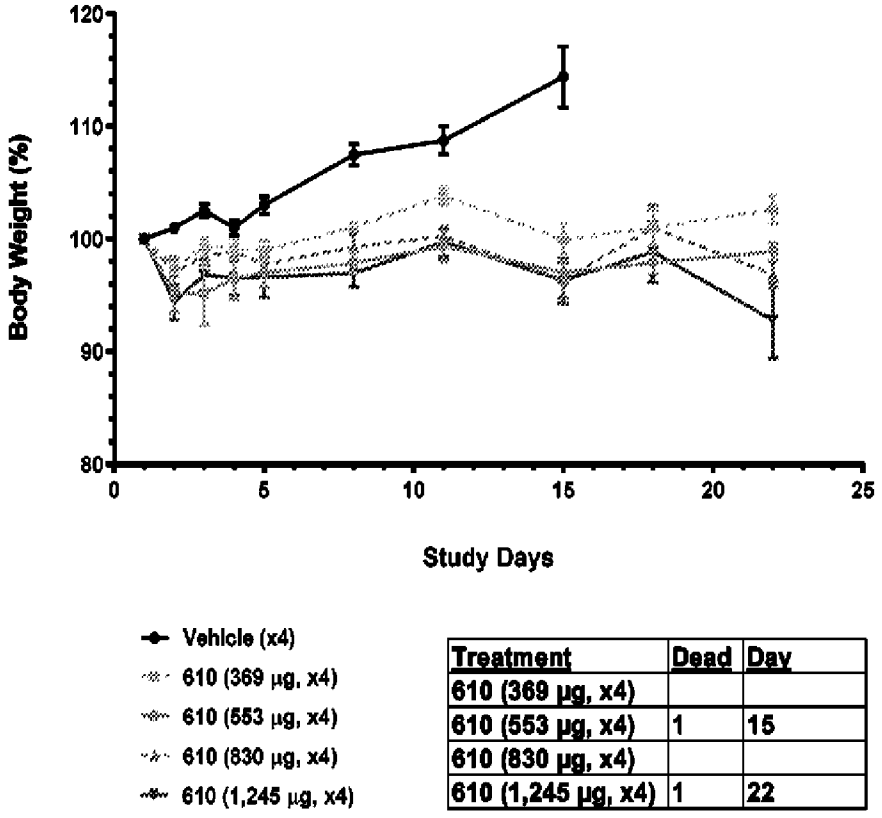

Vehicle (x4)
1 MTR (d12)
WW0643 (0.3 µg, x6)
1 MTR (d15)
WW0643 (1.5 µg, x6)
WW0643 (37.5 µg, x6)
1 MTR (d16)
2 TR (d15)
6 TR (d19)
WW0643 (7.5 µg, x6)
Tumor Volume (mm³)
Study Days

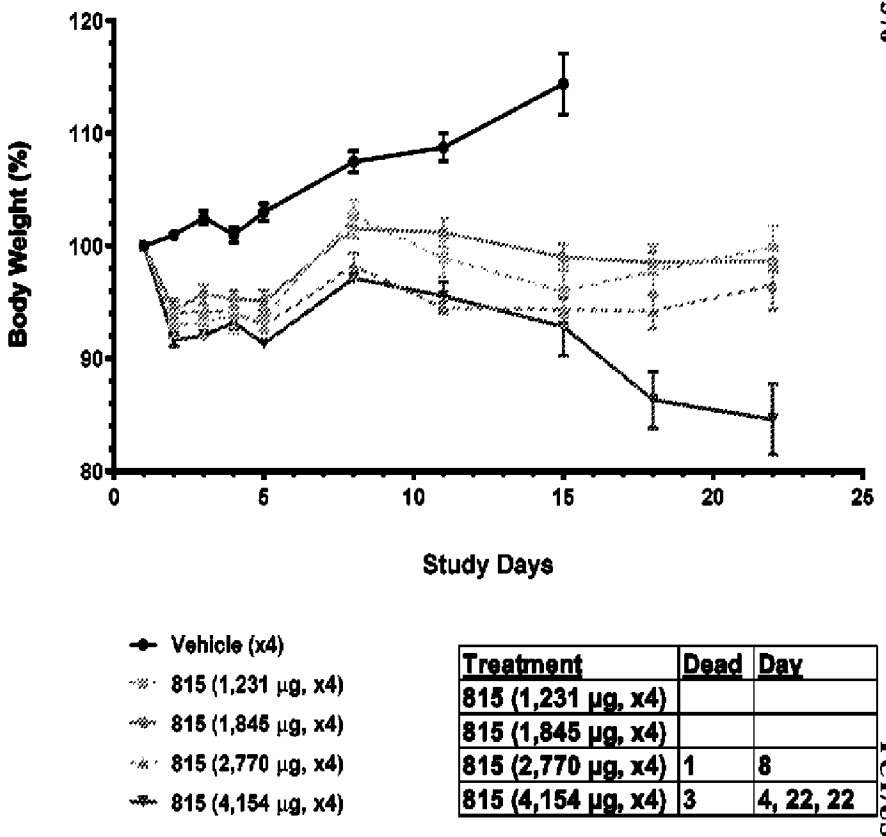
FIG. 40G

FIG. 41A



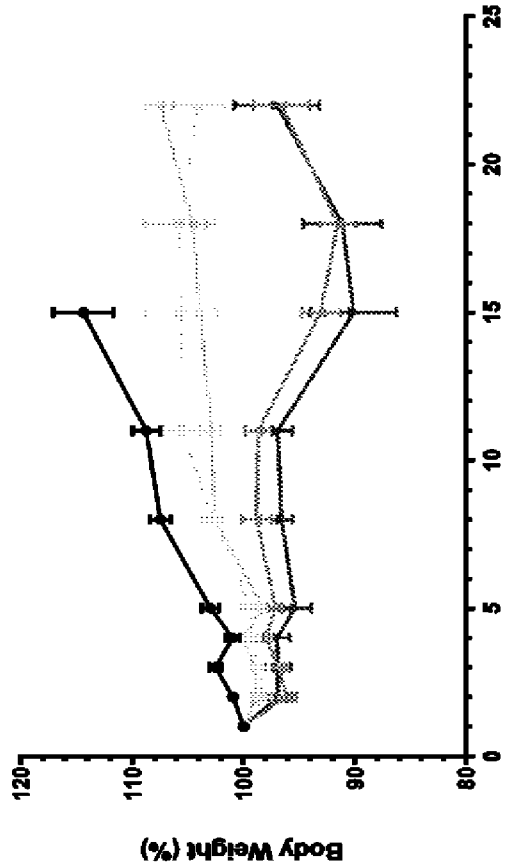
Treatment	Dead	Day
610 (369 µg, x4)		
610 (553 µg, x4)	1	15
610 (830 µg, x4)		
610 (1,245 µg, x4)	1	22

FIG. 41B



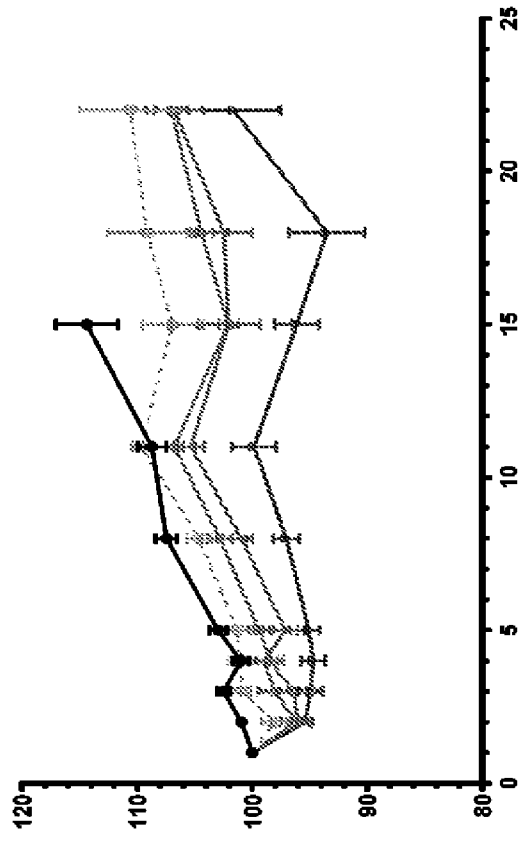
Treatment	Dead	Day
815 (1,231 µg, x4)		
815 (1,845 µg, x4)		
815 (2,770 µg, x4)	1	8
815 (4,154 µg, x4)	3	4, 22, 22

FIG. 41C



Treatment	Dead	Day
644 (4.6 µg, x4)		
644 (9.3 µg, x4)		
644 (19 µg, x4)		
644 (37 µg, x4)	3	15, 18, 22

FIG. 41D



Treatment	Dead	Day
816 (31 µg, x4)		
816 (62 µg, x4)		
816 (123 µg, x4)		
816 (247 µg, x4)	3	15, 22, 22

FIG. 41E

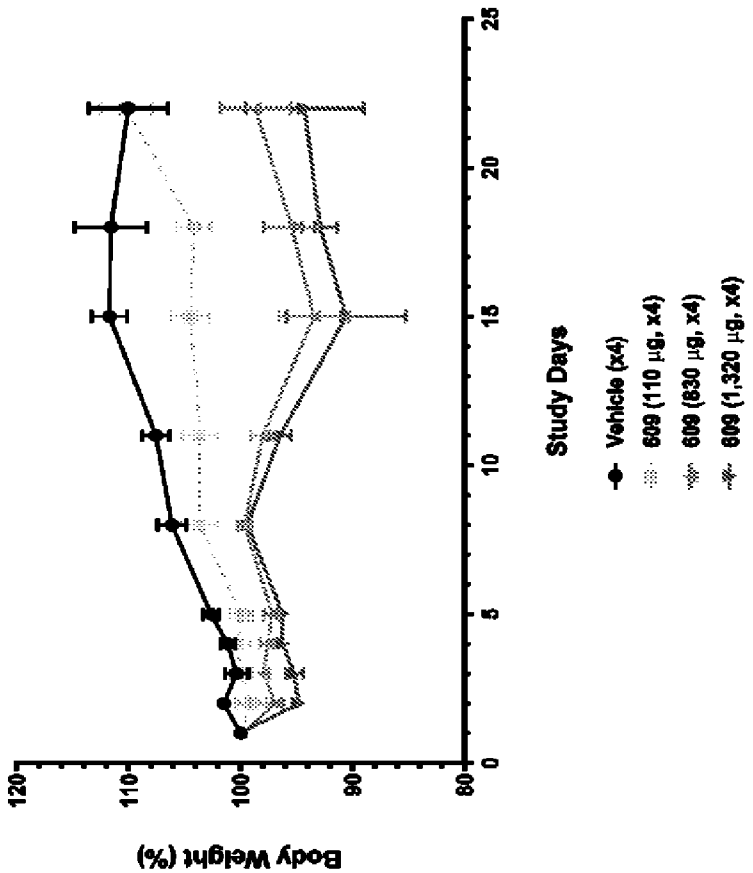
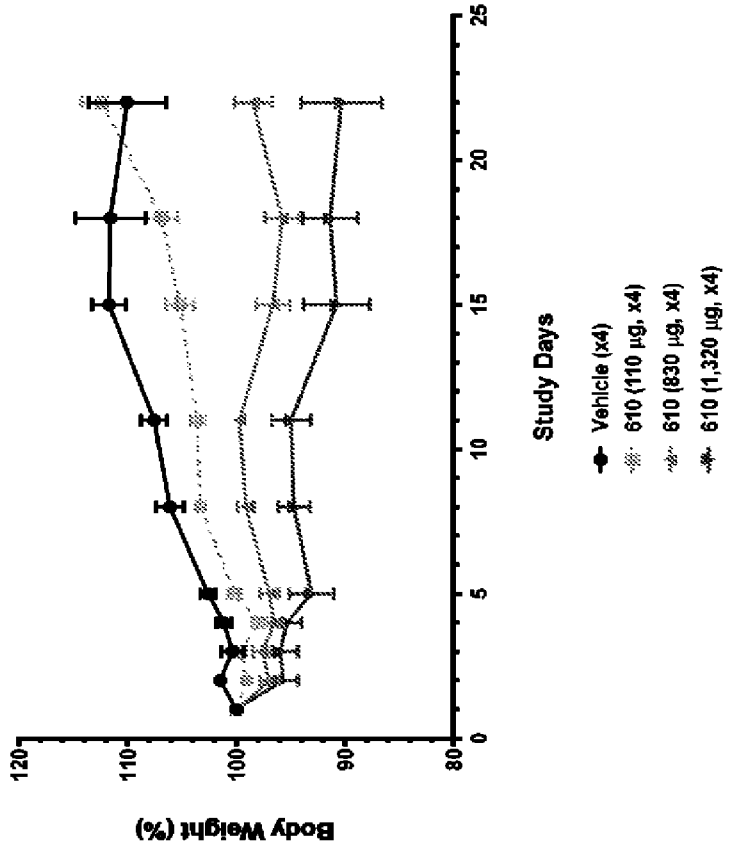


FIG. 41F



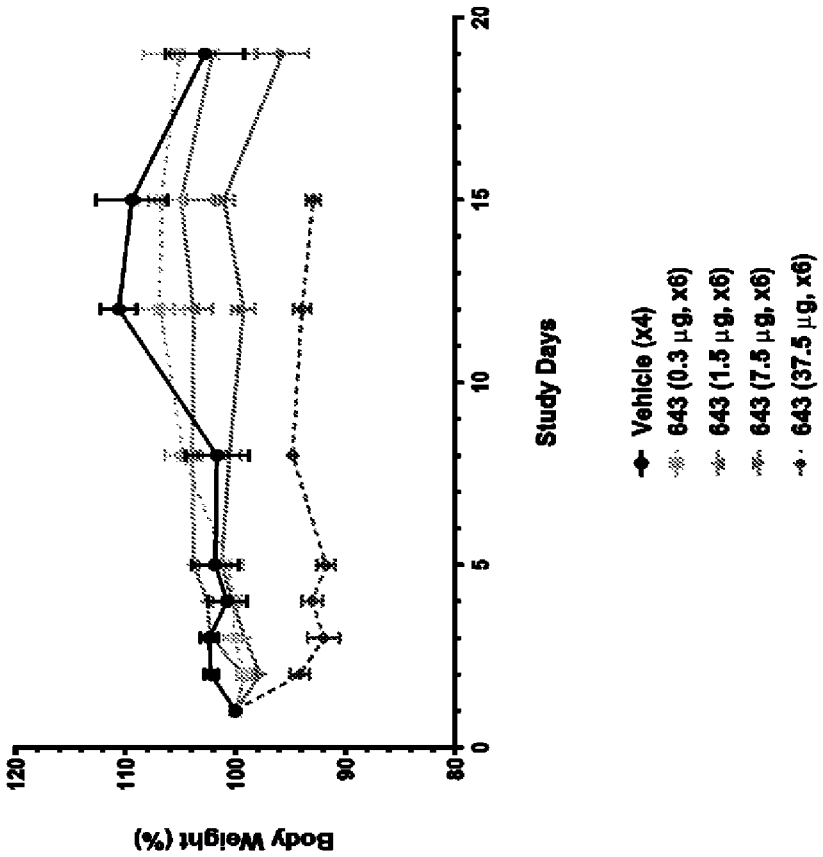
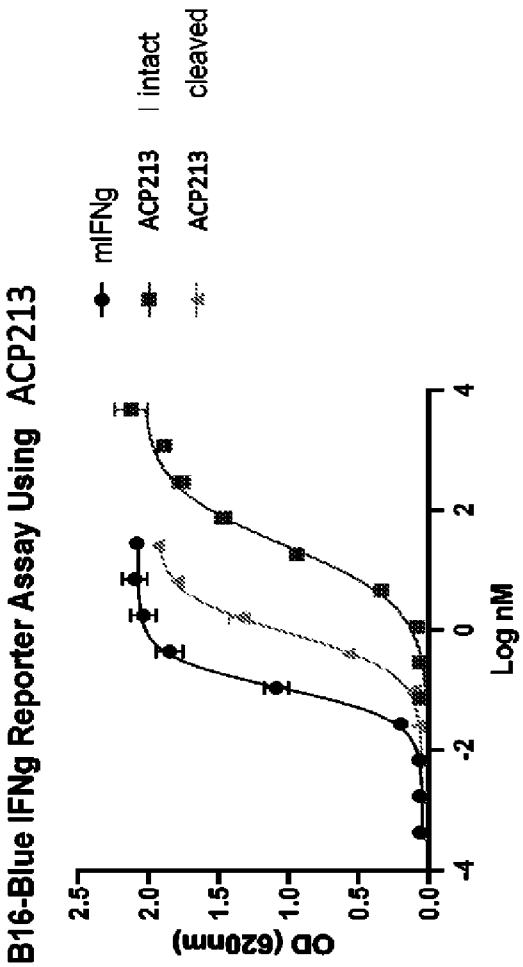

Body Weight (%)
120
110
100
90
80
0
5
10
15
20
Study Days
Vehicle (x4)
643 (0.3 µg, x6)
643 (1.5 µg, x6)
643 (7.5 µg, x6)
643 (37.5 µg, x6)

FIG. 41G


B16-Blue IFNg Reporter Assay Using ACP211
mIFNg
ACP211
ACP211
intact
cleaved
OD (620nm)
Log nM
B16-Blue IFNa/b Reporter Assay Using ACP211
mIFNa1
ACP211
ACP211
intact
cleaved
OD (620nm)
Log nM
uncut cut
IFNγ
IFNα
Anti-HSA

FIG. 42A


B16-Blue IFNg Reporter Assay Using ACP213
mIFNg
ACP213 intact
ACP213 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
4
Log nM

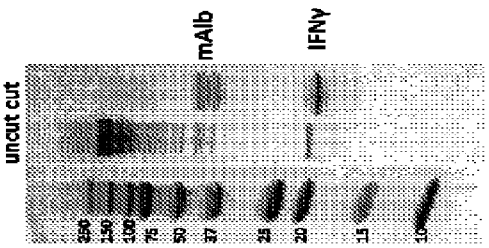
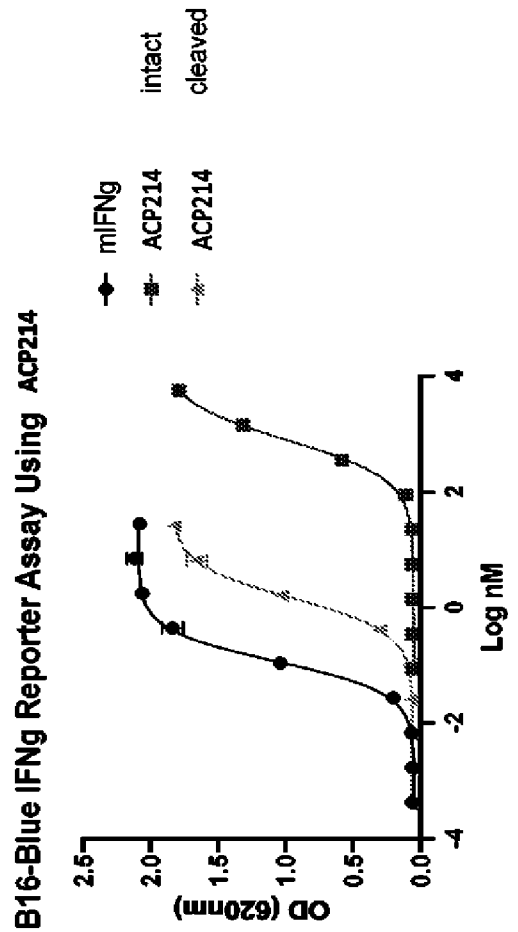

uncut cut
mAlb
IFNγ

FIG. 42B


B16-Blue IFNg Reporter Assay Using ACP214
mIFNg
ACP214 intact
ACP214 cleaved
OD (620nm)
Log nM
2.5
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
4

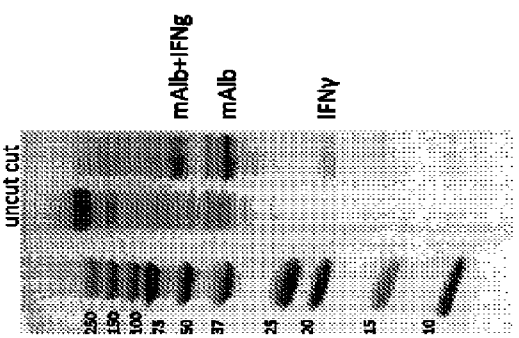
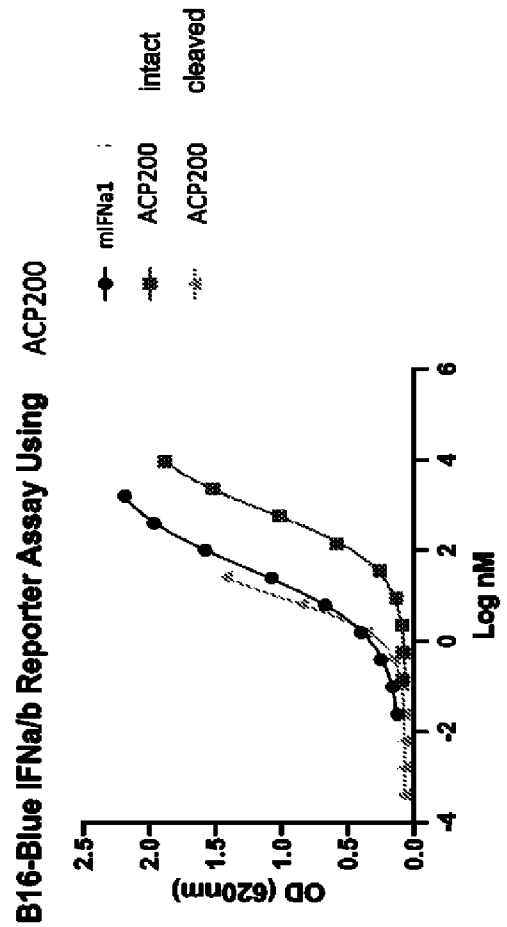

uncut cut
mAlb+IFNg
mAlb
IFNγ
250
150
100
75
50
37
25
20
15
10

FIG. 42C


B16-Blue IFNa/b Reporter Assay Using ACP200
mIFNa1
ACP200 intact
ACP200 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-4
-2
0
2
4
6
Log nM

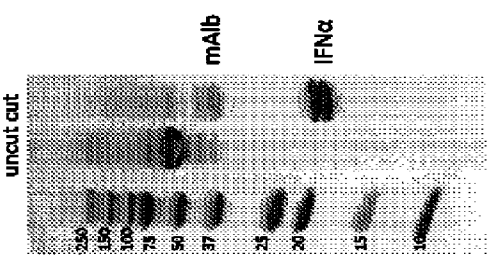
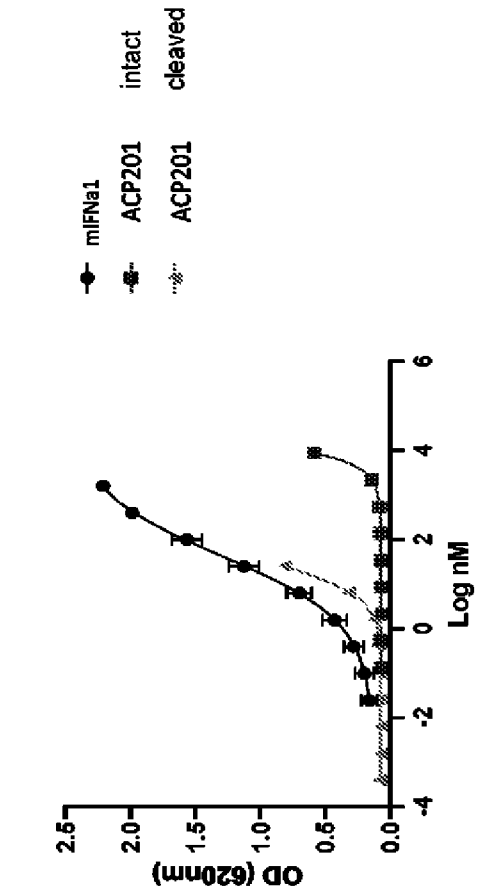

uncut cut
mAlb
IFNα
250
150
100
75
50
37
25
20
15
10

FIG. 42D


mIFNa1
ACP201 intact
ACP201 cleaved
OD (620nm)
Log nM

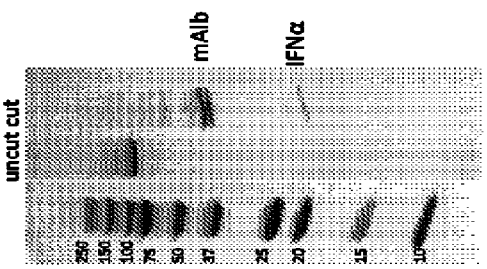

uncut cut
mAlb
IFNα

FIG. 42E

Mouse Serum Albumin	KD (nM)	kon(1/Ms)	kdis(1/s)
ACP16	2.6	4.3E+4	1.1E-4
ACP10	0.38	2.5E+5	9.7E-5
ACP11	No binding	No binding	No binding

Human Serum Albumin	KD (nM)	kon(1/Ms)	kdis(1/s)
ACP16	4.3	3.4E+5	1.5E-3
ACP10	4.4	2.8E+5	1.2E-3
ACP11	79	3.1E+4	2.5E-3

FIG. 43

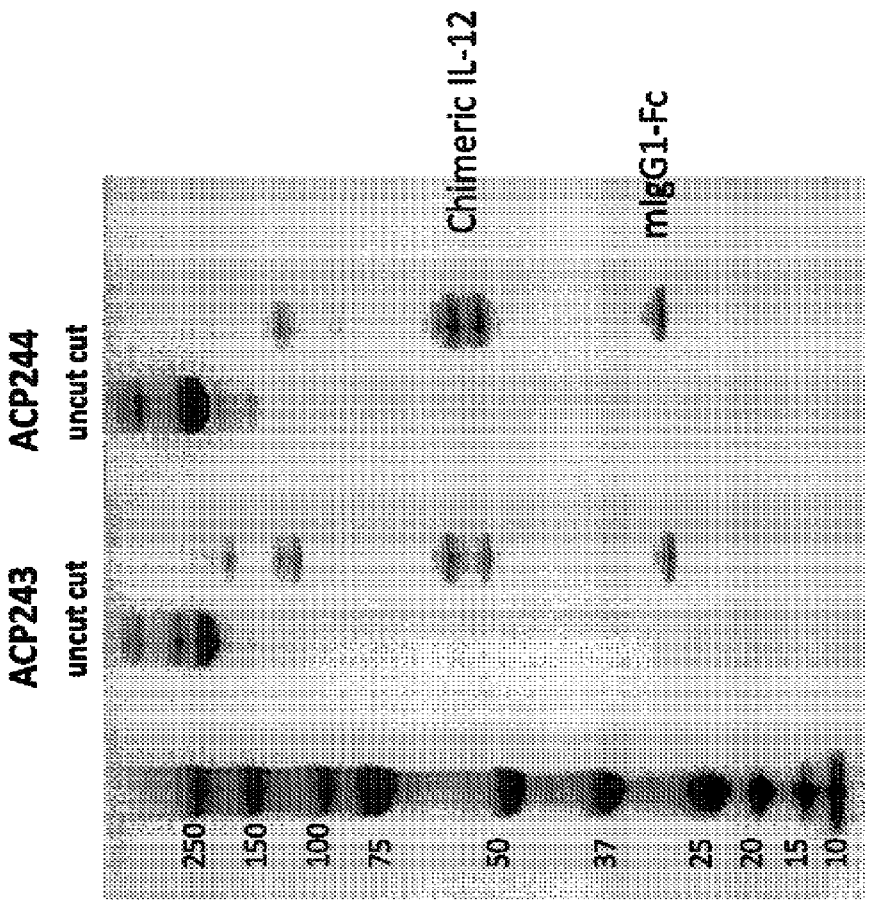
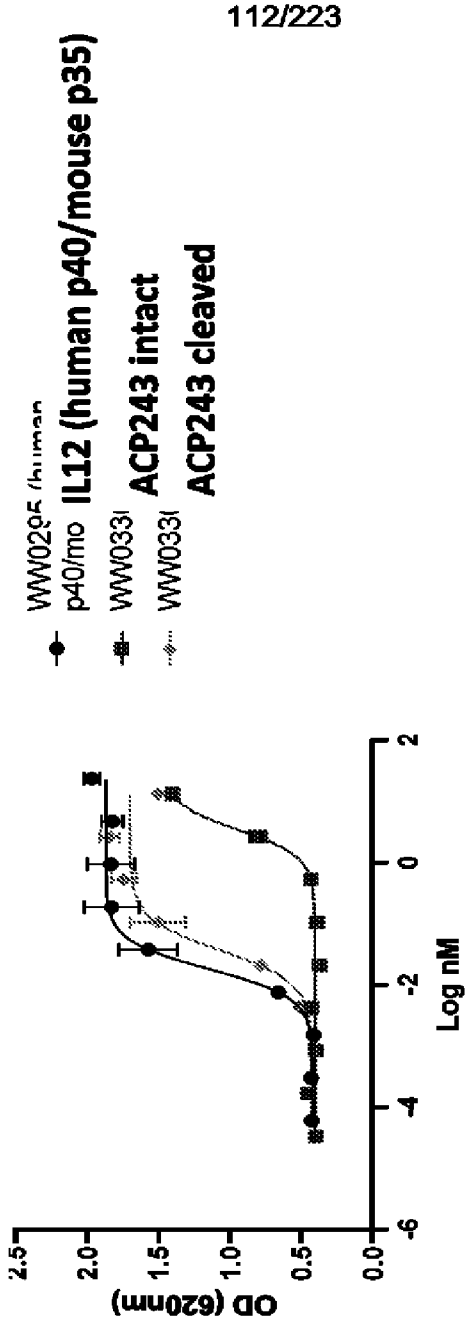

ACP243
uncut cut
ACP244
uncut cut
Chimeric IL-12
mIgG1-Fc
250
150
100
75
50
37
25
20
15
10

FIG. 44A


WW0295 (human
p40/mo
IL12 (human p40/mouse p35)
WW033
ACP243 intact
WW033
ACP243 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM

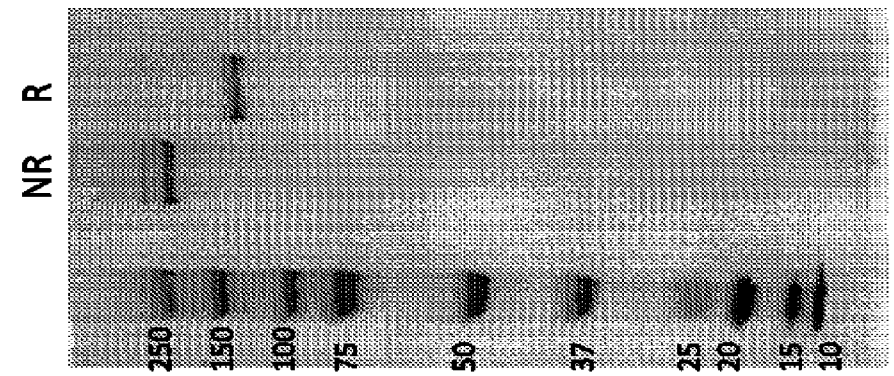
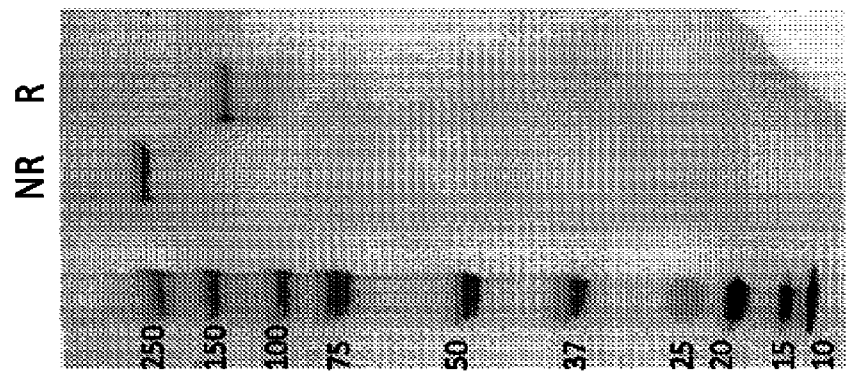

NR R
250
150
100
75
50
37
25
20
15
10

FIG. 44B


NR R
250
150
100
75
50
37
25
20
15
10

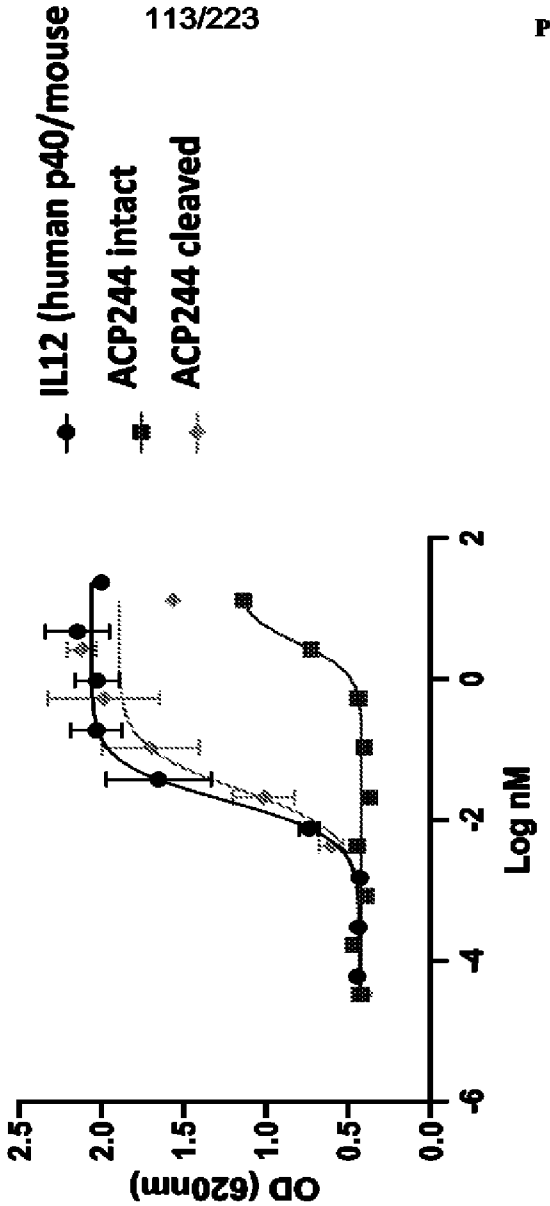

IL12 (human p40/mouse
ACP244 intact
ACP244 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM

FIG. 44C

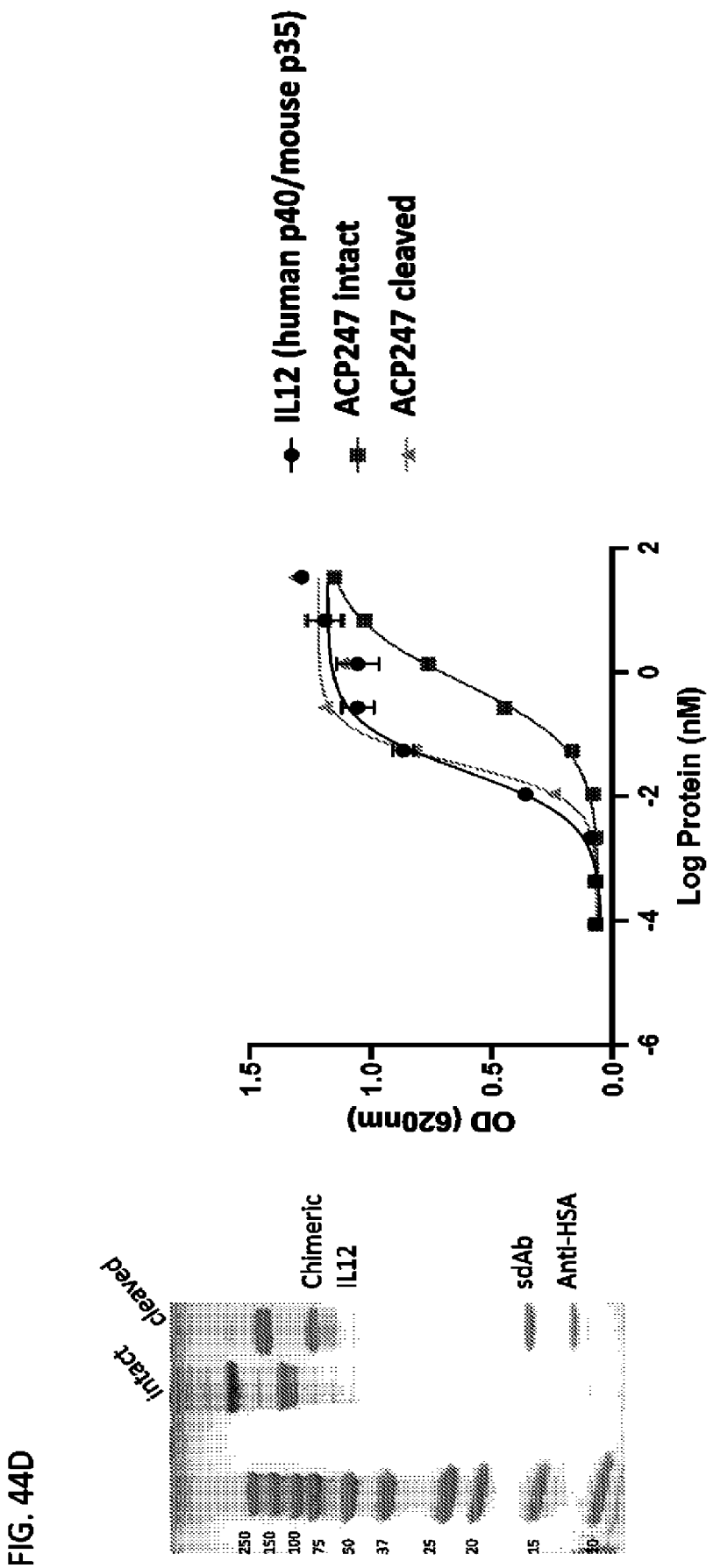

IL12 (human p40/mouse p35)
ACP247 Intact
ACP247 cleaved
OD (620nm)
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)
cleaved
intact
Chimeric IL12
sdAb
Anti-HSA
250
150
100
75
50
37
25
20
15
10

FIG. 44D

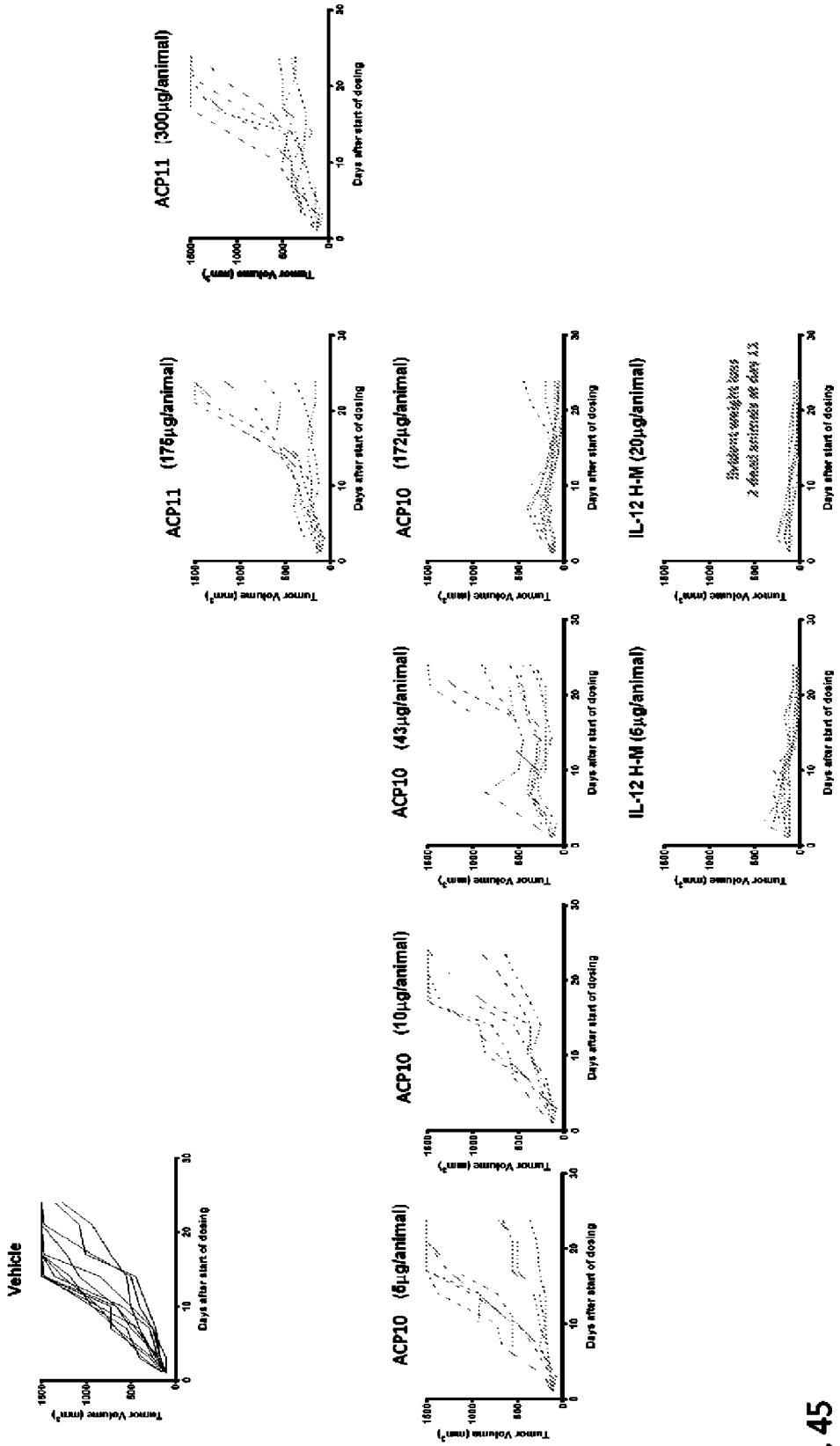
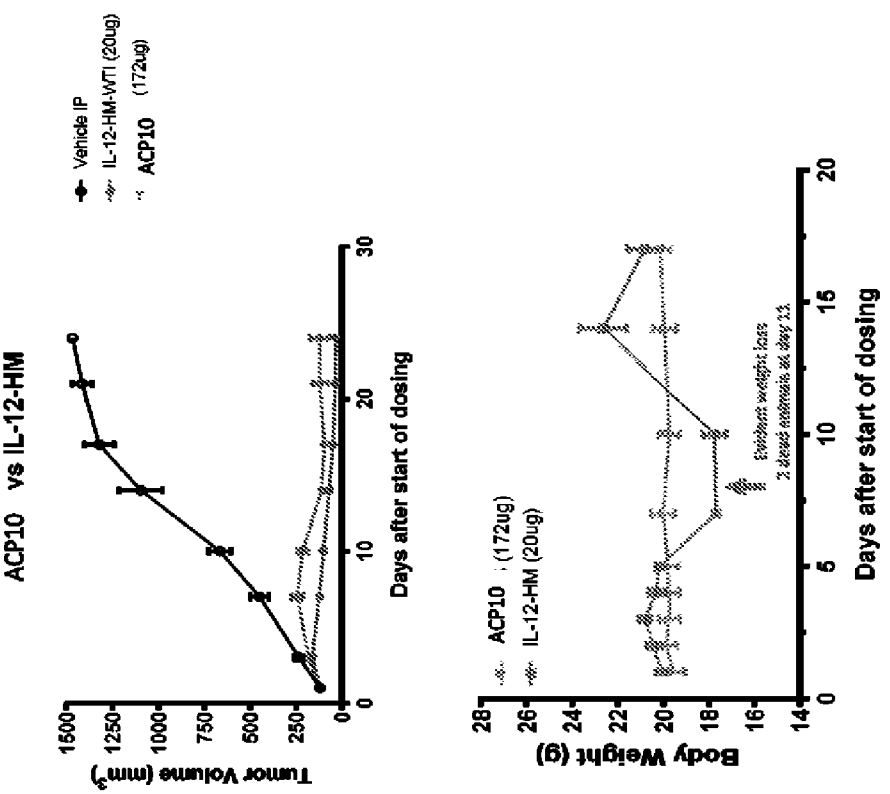

Vehicle
ACP10 (6µg/animal)
ACP10 (10µg/animal)
ACP10 (43µg/animal)
IL-12 H-M (6µg/animal)
ACP10 (172µg/animal)
IL-12 H-M (20µg/animal)
ACP11 (175µg/animal)
ACP11 (300µg/animal)
Tumor Volume (mm³)
Days after start of dosing

FIG. 45

FIG. 46A


ACP10 vs IL-12-HM
Vehicle IP
IL-12-HM-WTI (20ug)
ACP10 (172ug)
Tumor Volume (mm³)
1500
1250
1000
750
500
250
0
0
10
20
30
Days after start of dosing
ACP10 (172ug)
IL-12-HM (20ug)
Body Weight (g)
28
26
24
22
20
18
16
14
0
5
10
15
20
Days after start of dosing

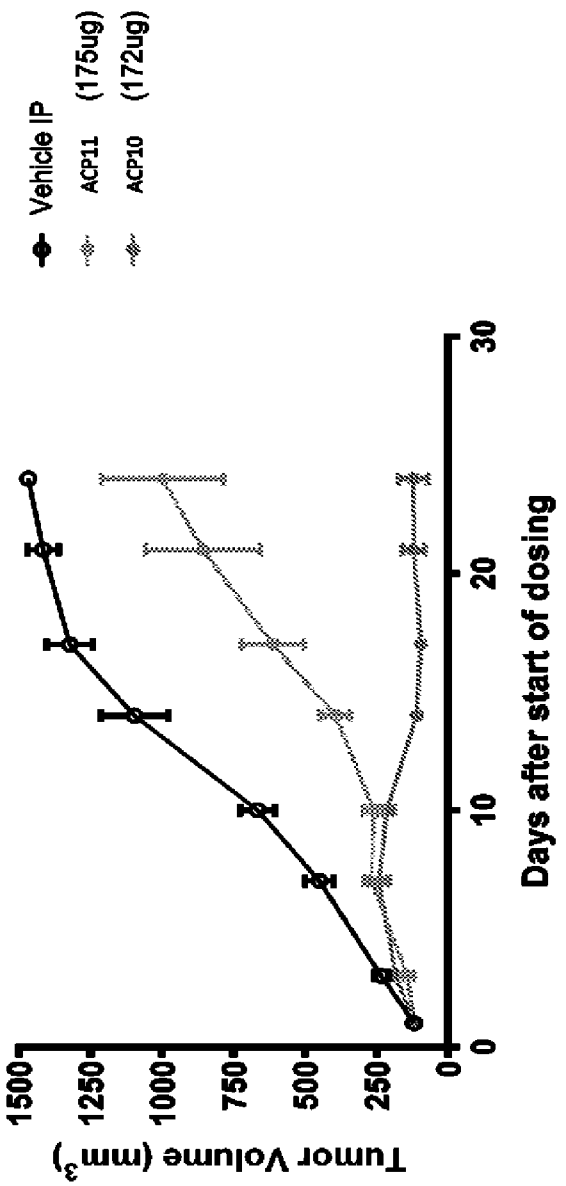

Vehicle IP
ACP11 (175ug)
ACP10 (172ug)
Tumor Volume (mm3)
1500
1250
1000
750
500
250
0
0
10
20
30
Days after start of dosing

FIG. 46B

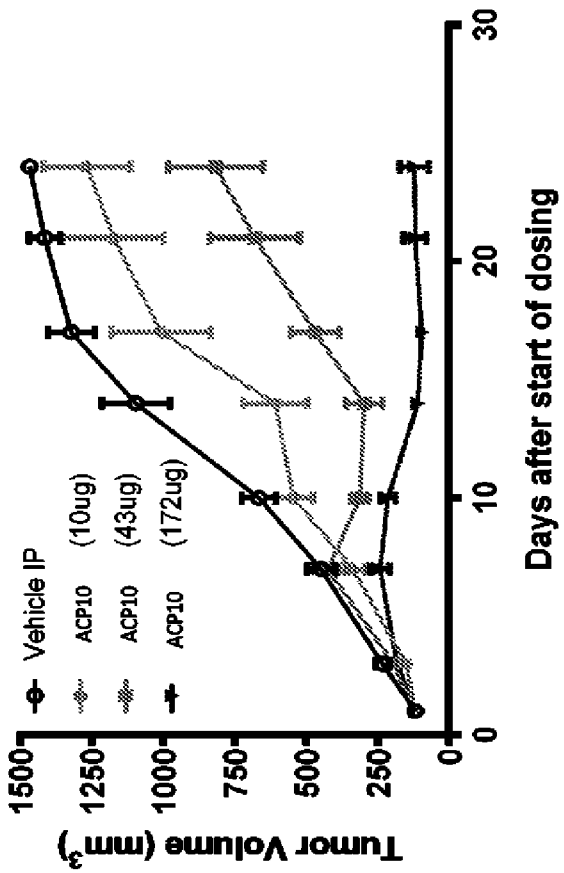

Tumor Volume (mm³)
1500
1250
1000
750
500
250
0
0
10
20
30
Days after start of dosing
Vehicle IP
ACP10 (10ug)
ACP10 (43ug)
ACP10 (172ug)

FIG. 46C

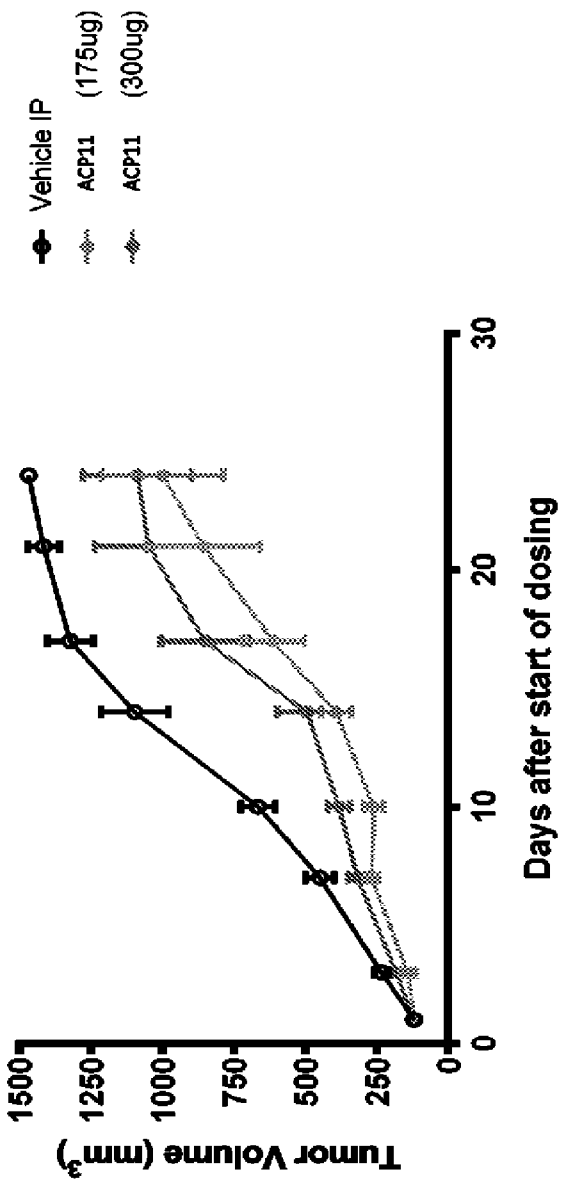
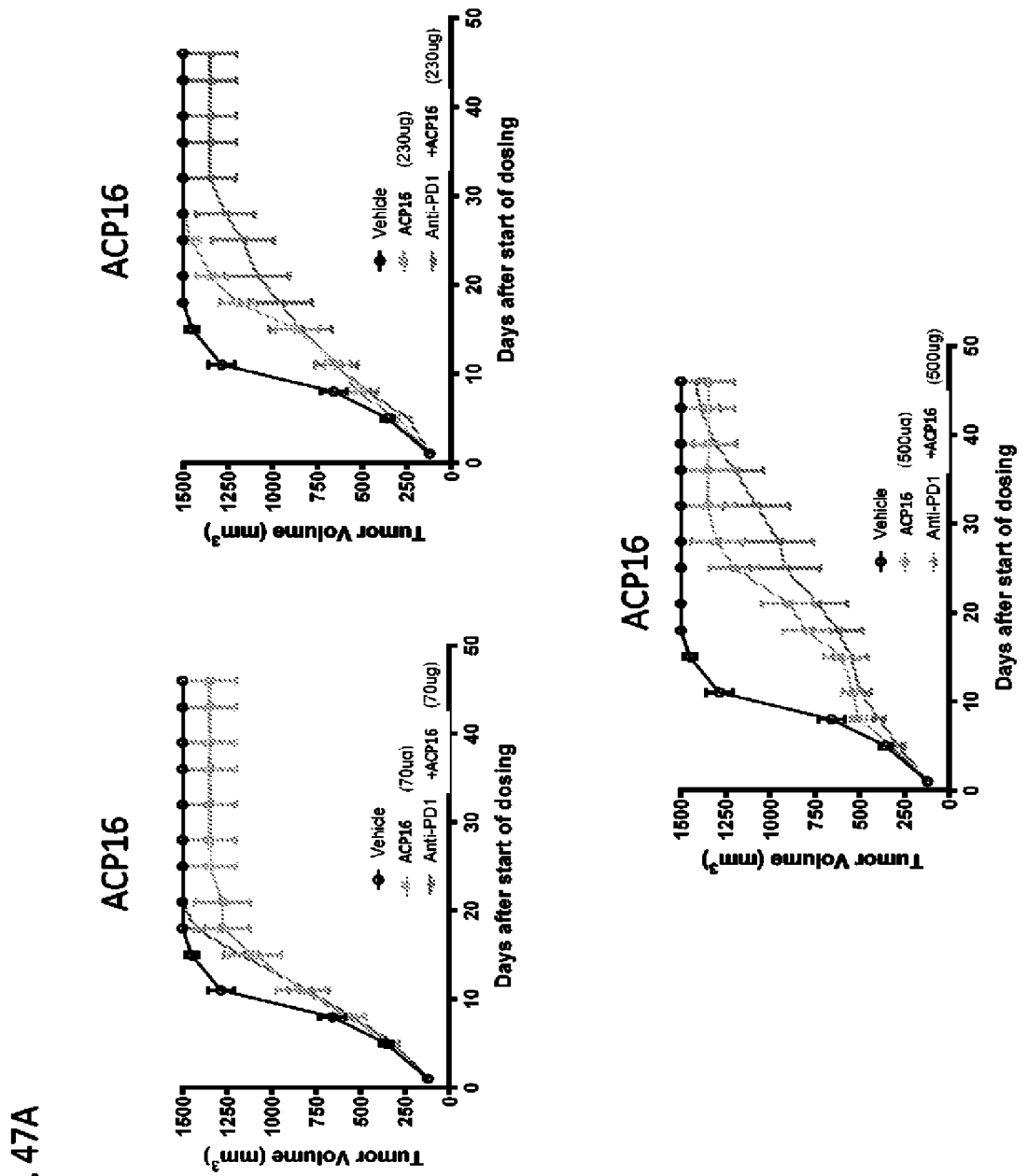

Vehicle IP
ACP11 (175ug)
ACP11 (300ug)
Tumor Volume (mm3)
1500
1250
1000
750
500
250
0
0
10
20
30
Days after start of dosing

FIG. 46D

FIG. 47A


ACP16
Tumor Volume (mm3)
Days after start of dosing
Vehicle
ACP16 (70uci)
Anti-PD1 +ACP16 (70ug)
ACP16
Tumor Volume (mm3)
Days after start of dosing
Vehicle
ACP16 (230ug)
Anti-PD1 +ACP16 (230ug)
ACP16
Tumor Volume (mm3)
Days after start of dosing
Vehicle
ACP16 (500uci)
Anti-PD1 +ACP16 (500ug)

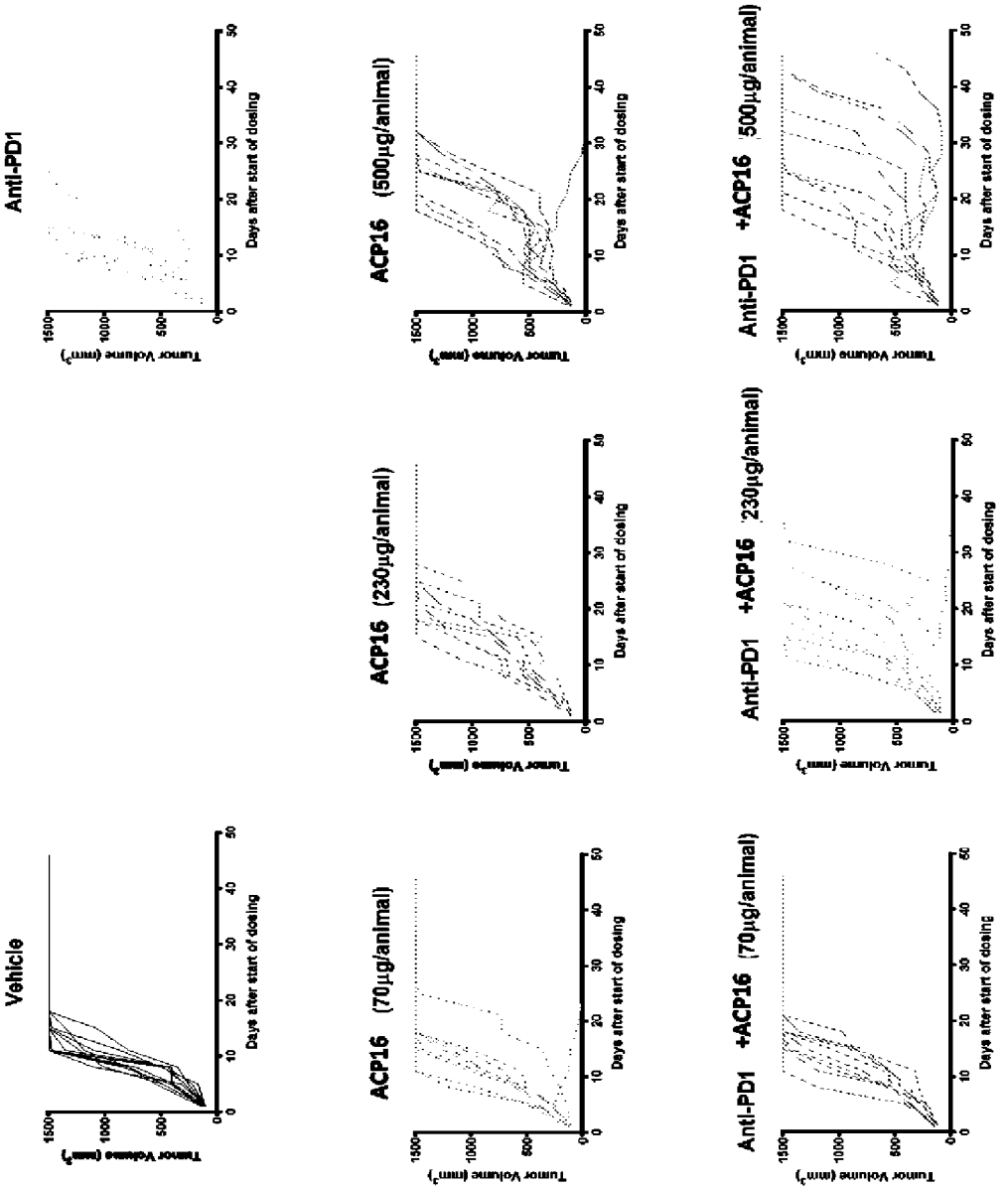

Vehicle
Anti-PD1
ACP16 (70µg/animal)
ACP16 (230µg/animal)
ACP16 (500µg/animal)
Anti-PD1 +ACP16 (70µg/animal)
Anti-PD1 +ACP16 (230µg/animal)
Anti-PD1 +ACP16 (500µg/animal)
Tumor Volume (mm³)
Days after start of dosing

FIG. 47B

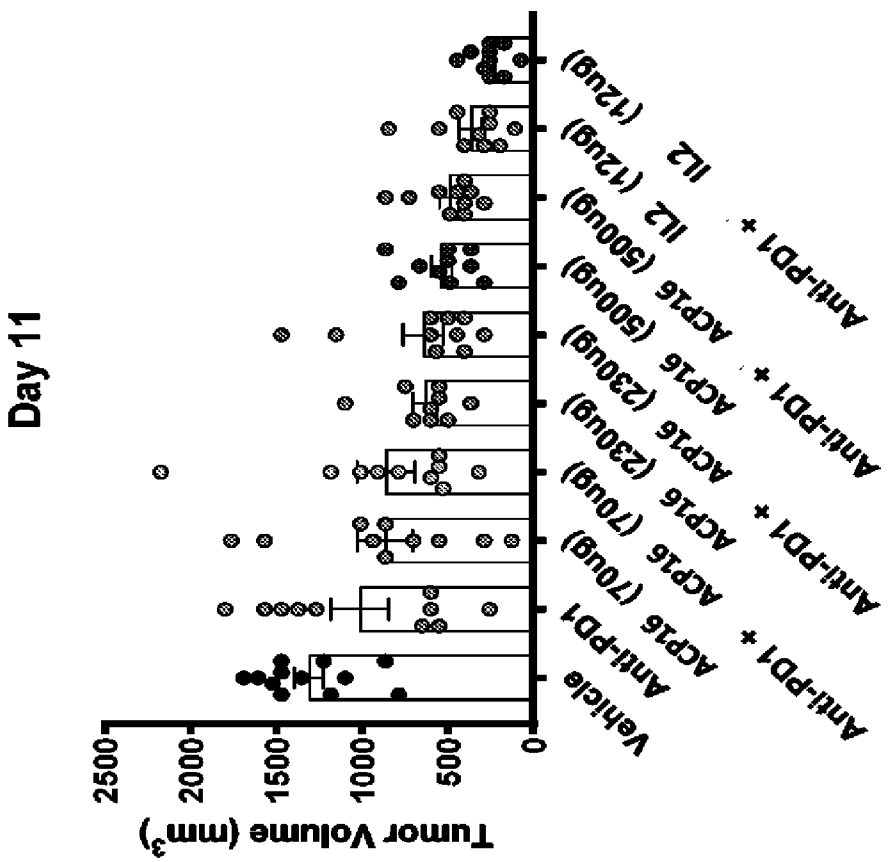

Day 11
Tumor Volume (mm³)
2500
2000
1500
1000
500
0
Vehicle
Anti-PD1
Anti-PD1 + ACP16 (70ug)
Anti-PD1 + ACP16 (230ug)
Anti-PD1 + ACP16 (500ug)
Anti-PD1 + IL2 (12ug)

FIG. 47C

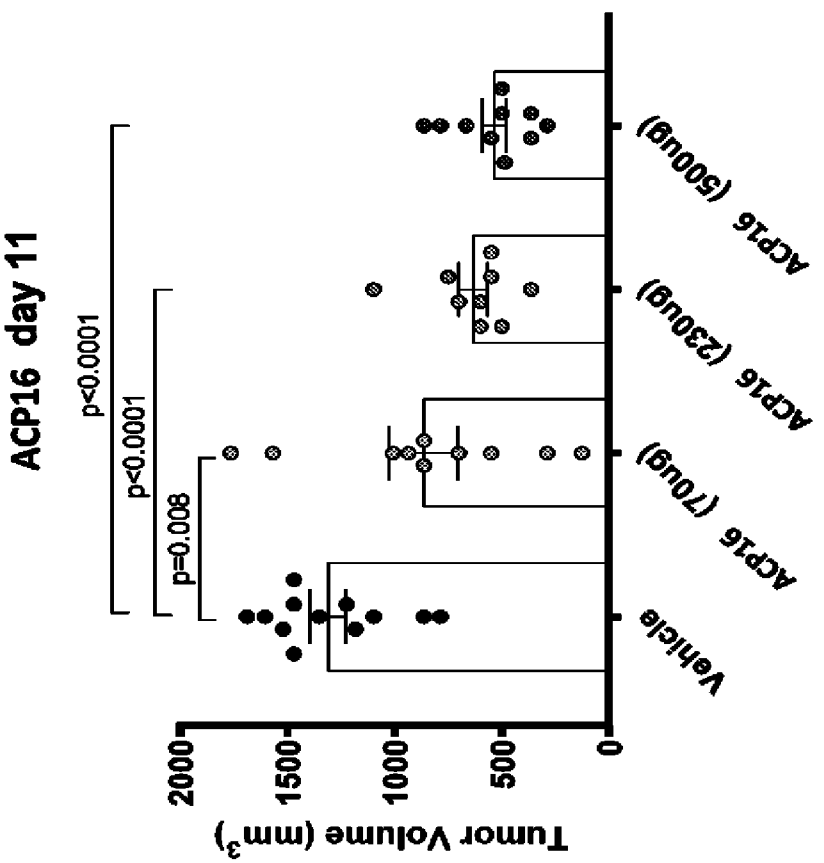

ACP16 day 11
p<0.0001
p<0.0001
p=0.008
Tumor Volume (mm3)
2000
1500
1000
500
0
Vehicle
ACP16 (70ug)
ACP16 (230ug)
ACP16 (500ug)

FIG. 47D

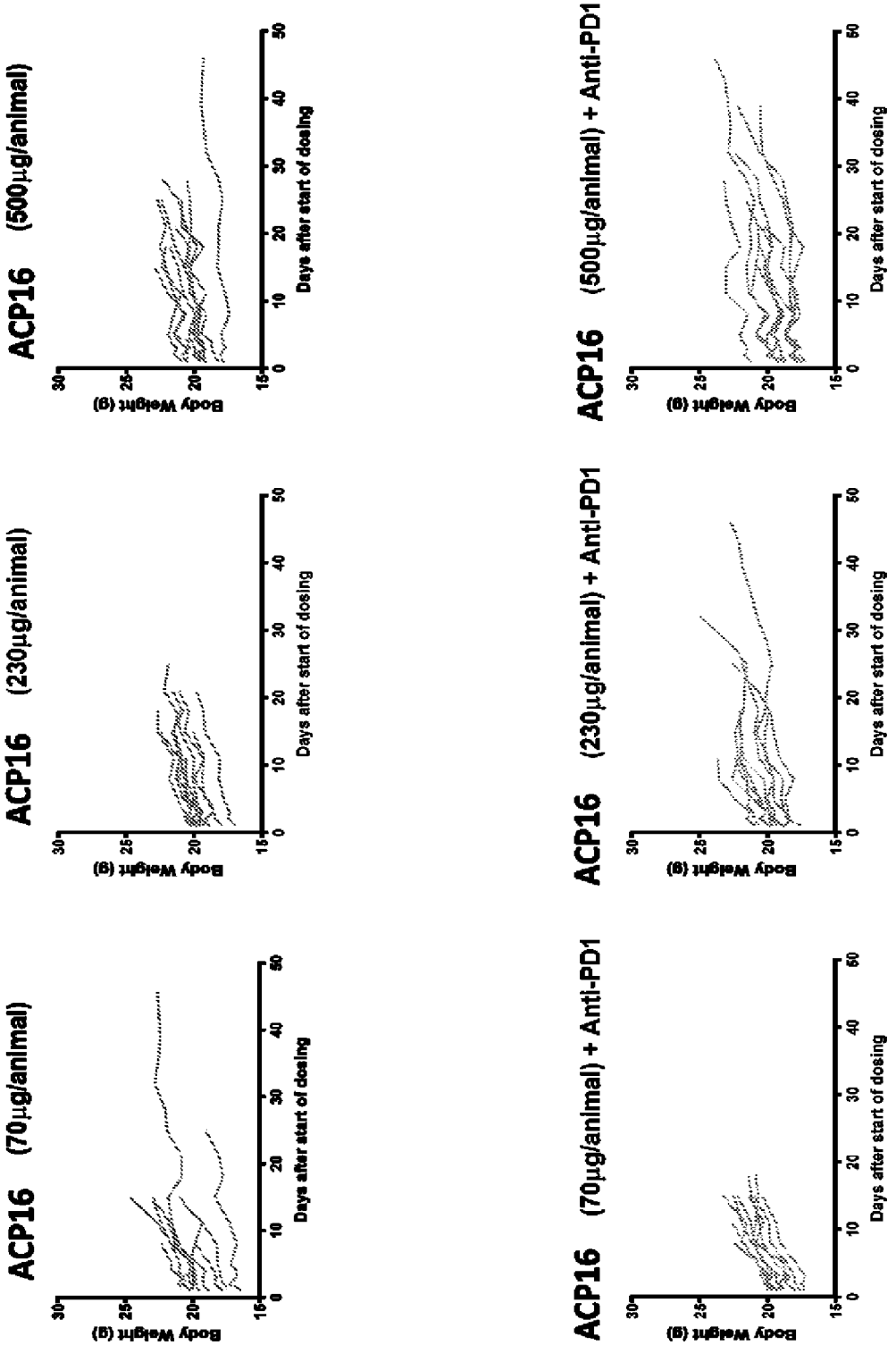

ACP16 (500μg/animal)
ACP16 (230μg/animal)
ACP16 (70μg/animal)
ACP16 (500μg/animal) + Anti-PD1
ACP16 (230μg/animal) + Anti-PD1
ACP16 (70μg/animal) + Anti-PD1
Body weight (g)
Days after start of dosing
30
25
20
15
0
10
20
30
40
50
60

FIG. 48A

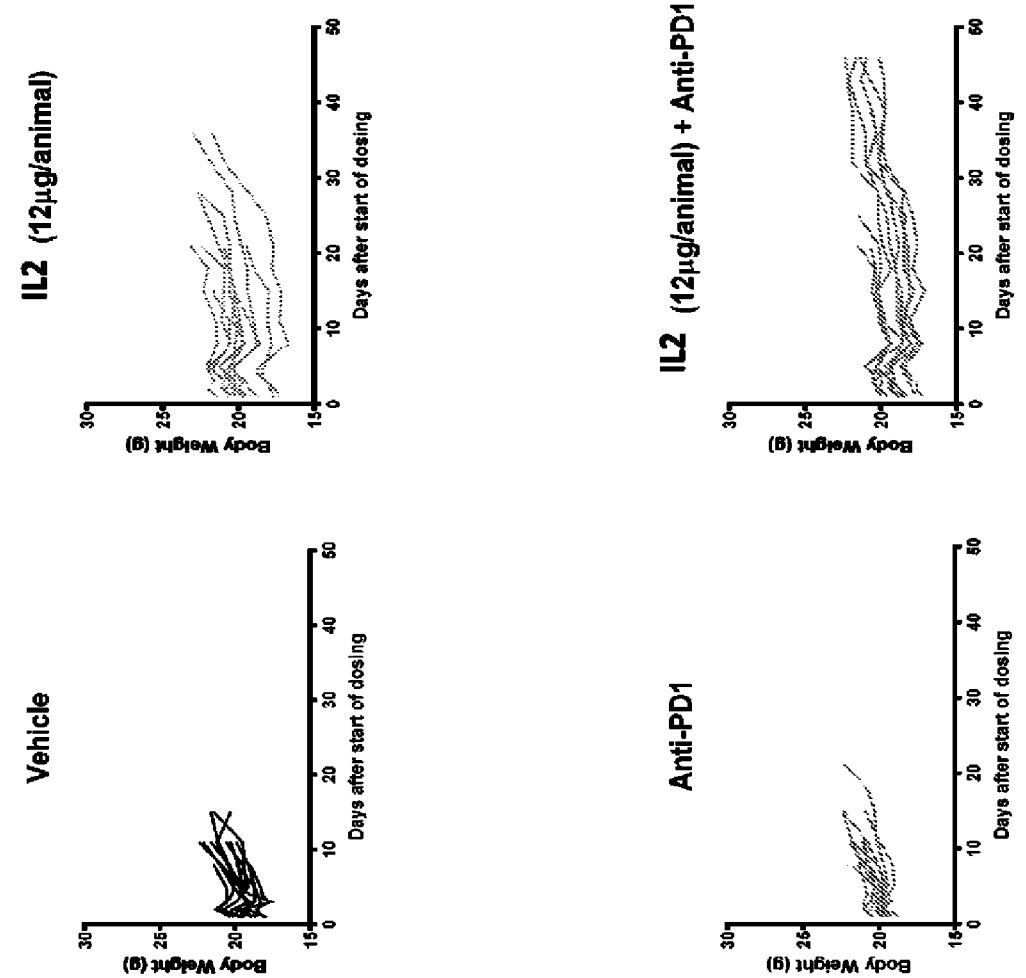

IL2 (12μg/animal)
IL2 (12μg/animal) + Anti-PD1
Vehicle
Anti-PD1
Body Weight (g)
Days after start of dosing
30
25
20
15
0
10
20
30
40
50
60

FIG. 48B

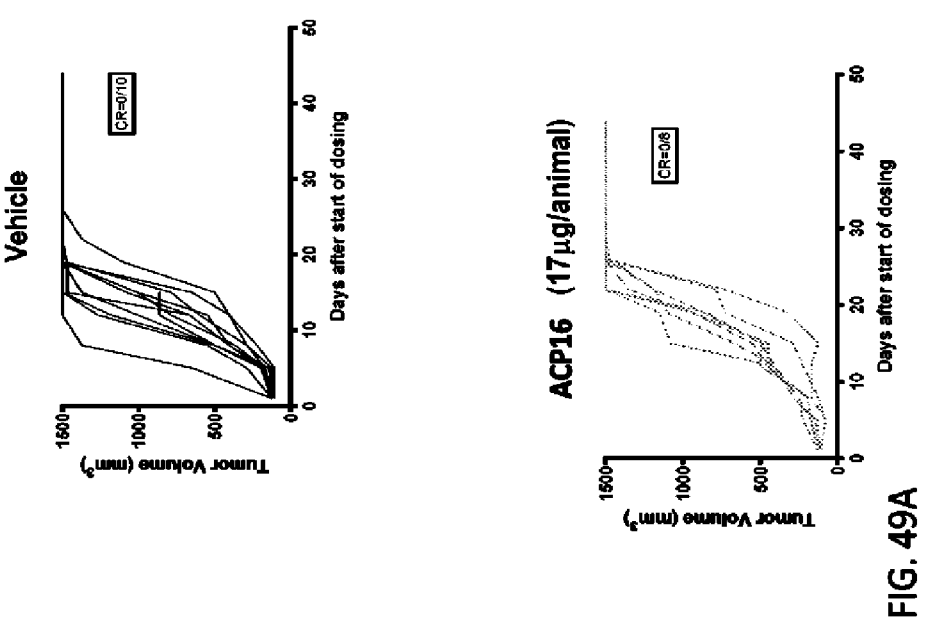

Vehicle
CR=0/10
ACP16 (17µg/animal)
CR=0/8
ACP16 (55µg/animal)
CR=7/8
ACP16 (230µg/animal)
CR=7/7
Tumor Volume (mm³)
Days after start of dosing
0
500
1000
1500
10
20
30
40
50

FIG. 49A

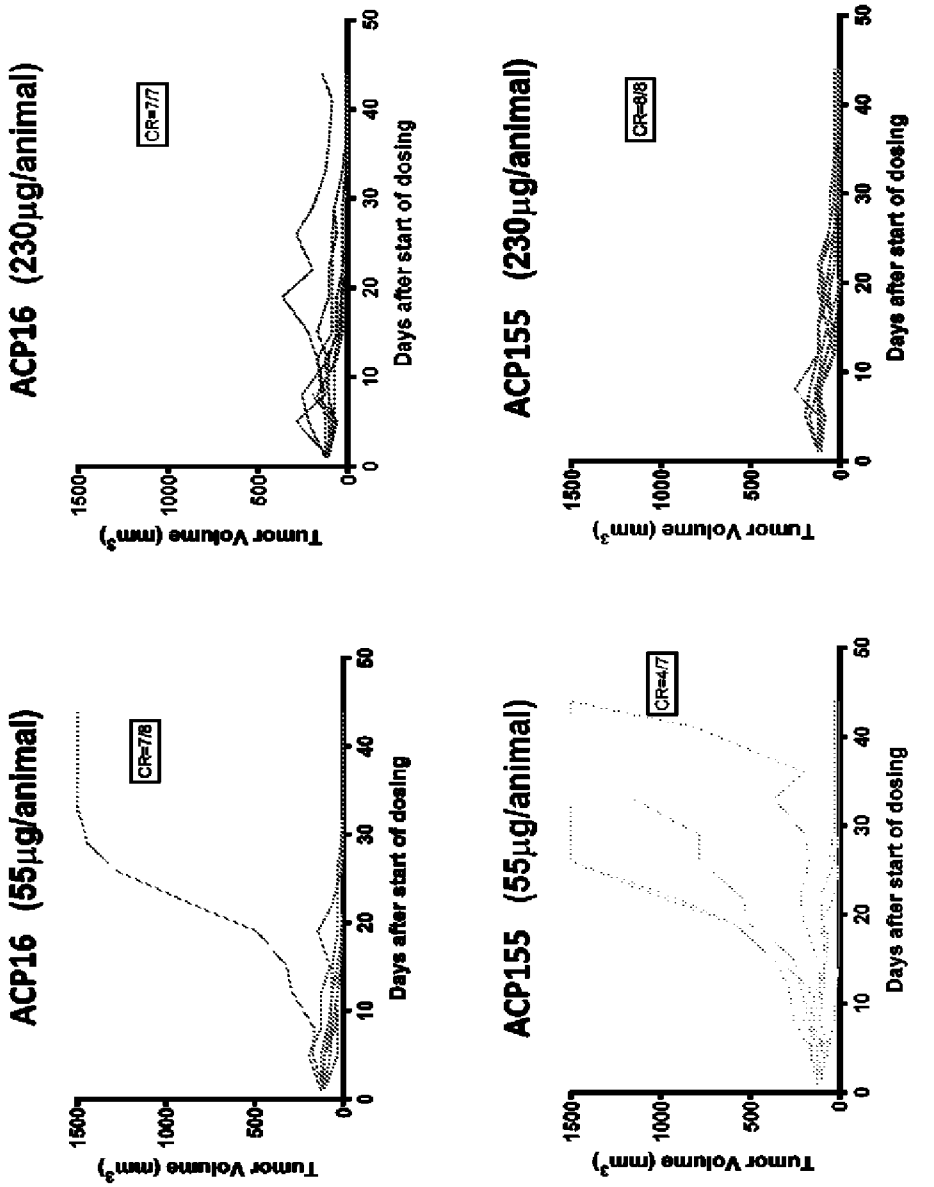

ACP16 (230µg/animal)
CR=7/7
Tumor Volume (mm³)
Days after start of dosing
ACP155 (230µg/animal)
CR=0/8
Tumor Volume (mm³)
Days after start of dosing
ACP16 (55µg/animal)
CR=7/8
Tumor Volume (mm³)
Days after start of dosing
ACP155 (55µg/animal)
CR=4/7
Tumor Volume (mm³)
Days after start of dosing

FIG. 49B

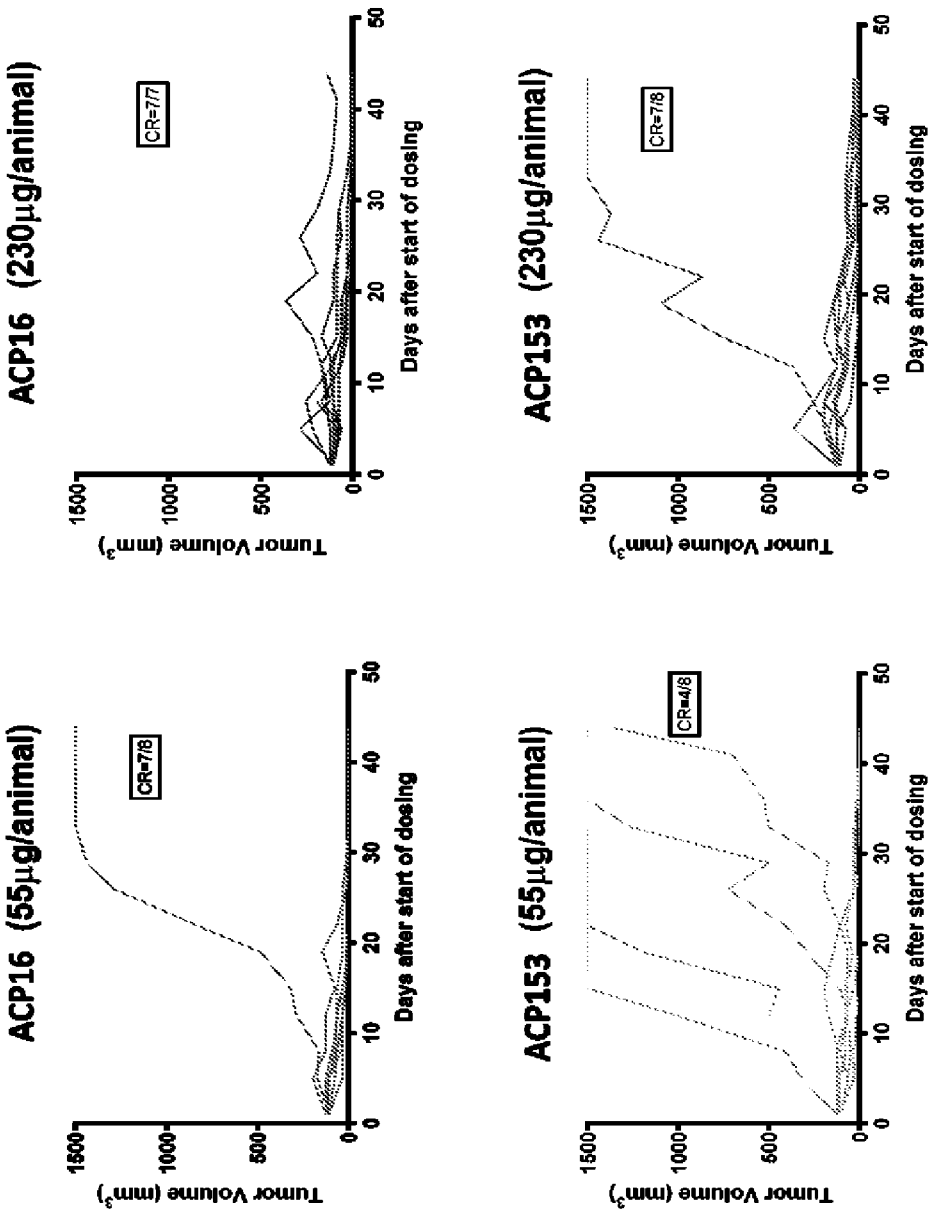

ACP16 (55µg/animal)
CR=7/8
Tumor Volume (mm³)
Days after start of dosing
ACP16 (230µg/animal)
CR=7/7
Tumor Volume (mm³)
Days after start of dosing
ACP153 (55µg/animal)
CR=4/8
Tumor Volume (mm³)
Days after start of dosing
ACP153 (230µg/animal)
CR=7/8
Tumor Volume (mm³)
Days after start of dosing

FIG. 49C

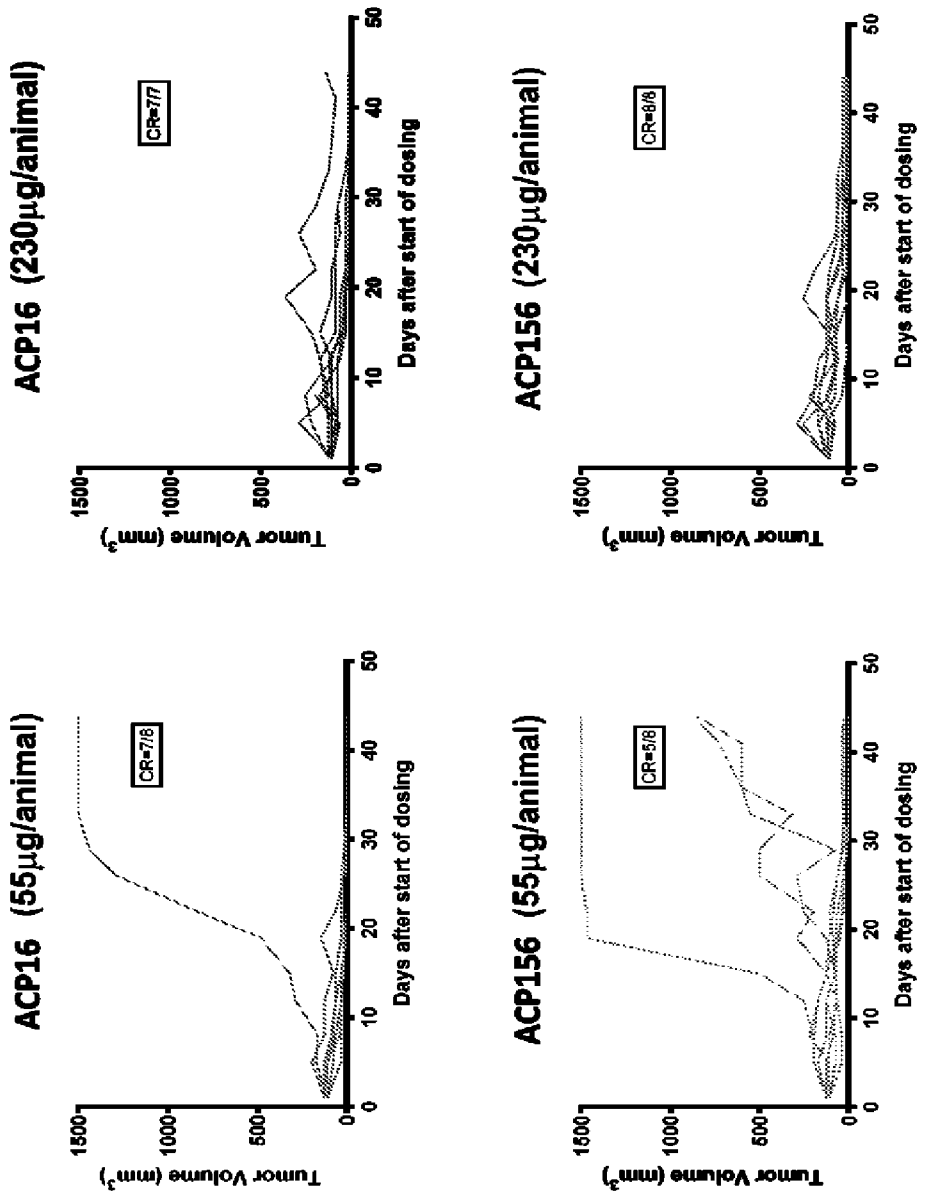

ACP16 (230µg/animal)
CR=7/7
Tumor Volume (mm³)
Days after start of dosing
ACP156 (230µg/animal)
CR=6/6
Tumor Volume (mm³)
Days after start of dosing
ACP16 (55µg/animal)
CR=7/8
Tumor Volume (mm³)
Days after start of dosing
ACP156 (55µg/animal)
CR=5/8
Tumor Volume (mm³)
Days after start of dosing

FIG. 49D

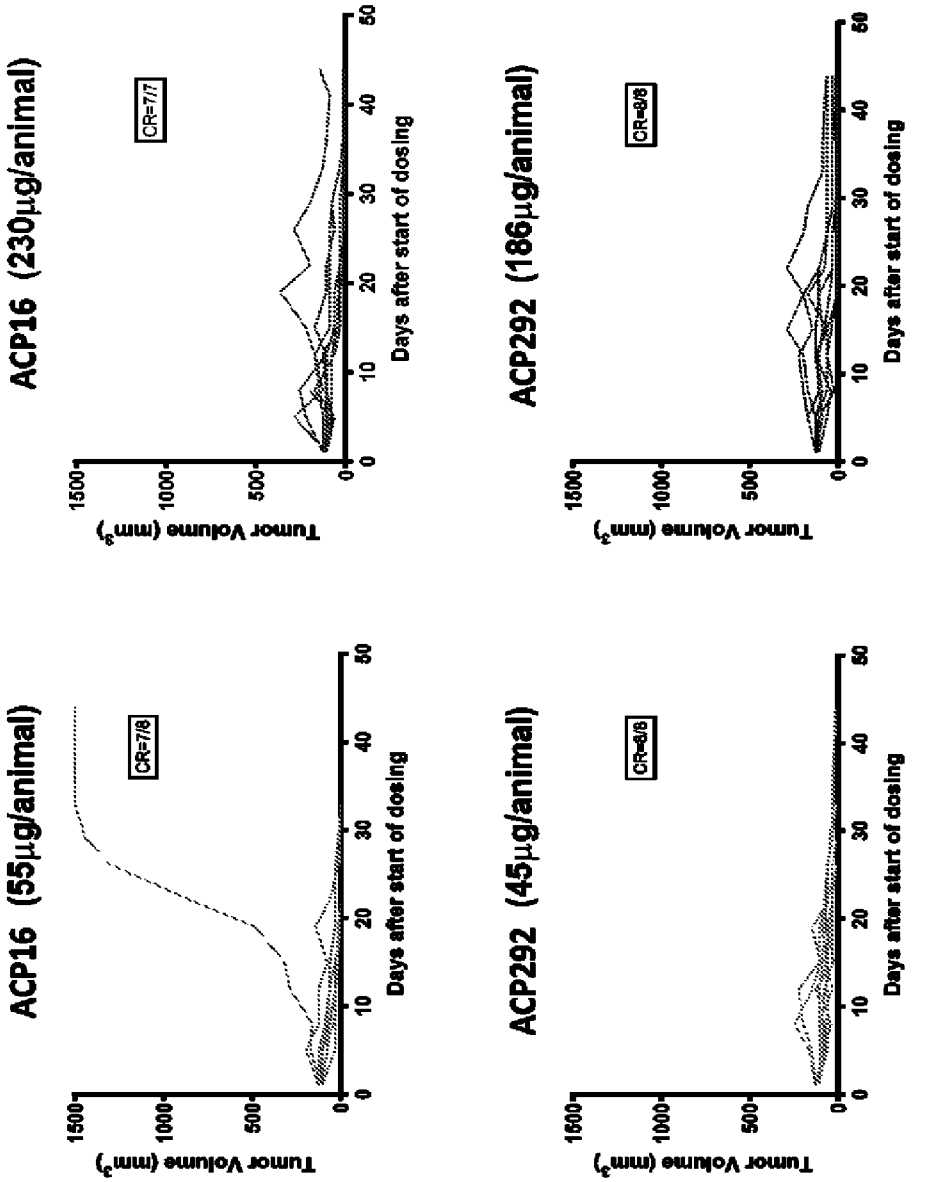

ACP16 (230μg/animal)
CR=7/7
Tumor Volume (mm³)
Days after start of dosing
ACP292 (186μg/animal)
CR=8/8
Tumor Volume (mm³)
Days after start of dosing
ACP16 (55μg/animal)
CR=7/8
Tumor Volume (mm³)
Days after start of dosing
ACP292 (45μg/animal)
CR=8/8
Tumor Volume (mm³)
Days after start of dosing

FIG. 49E

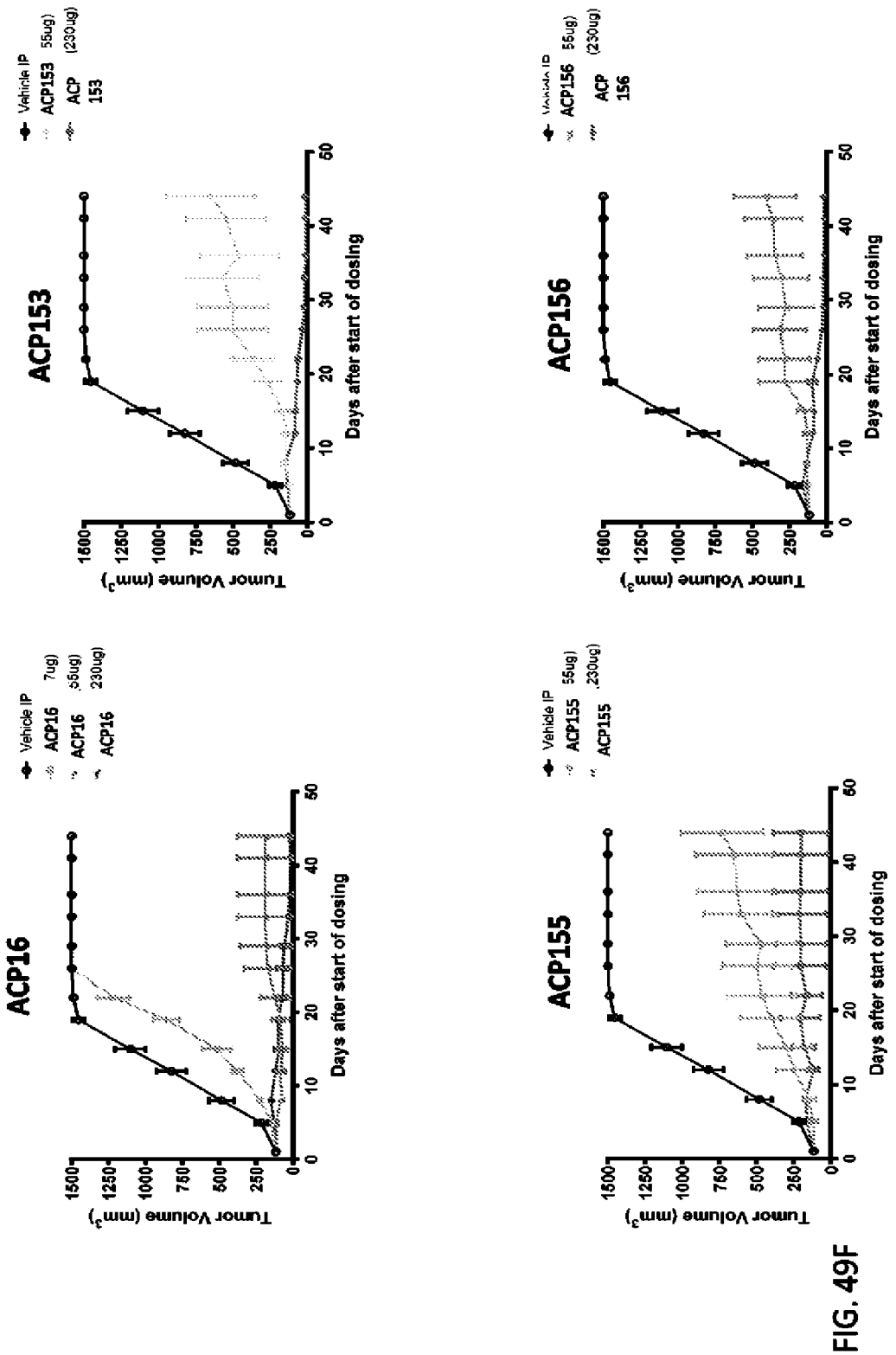
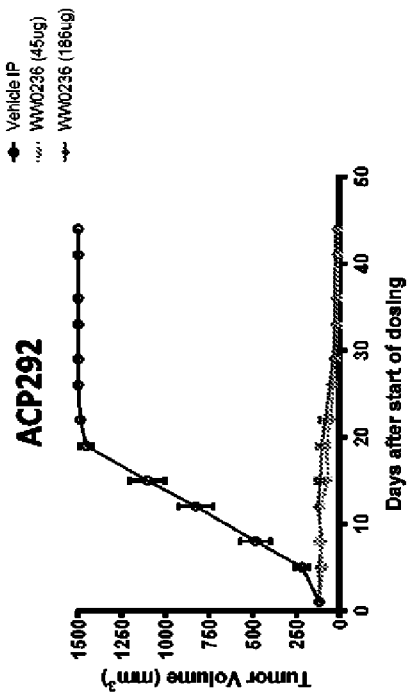

ACP16
Vehicle IP
ACP16 7ug)
ACP16 55ug)
ACP16 230ug)
Tumor Volume (mm3)
Days after start of dosing
ACP153
Vehicle IP
ACP153 55ug)
ACP 230ug)
153
Tumor Volume (mm3)
Days after start of dosing
ACP155
Vehicle IP
ACP155 55ug)
ACP155 230ug)
Tumor Volume (mm3)
Days after start of dosing
ACP156
ACP156 55ug)
ACP 230ug)
156
Tumor Volume (mm3)
Days after start of dosing

FIG. 49F


ACP292
Vehicle IP
WW0236 (45ug)
WW0236 (186ug)
Tumor Volume (mm³)
0
250
500
750
1000
1250
1500
0
10
20
30
40
50
Days after start of dosing

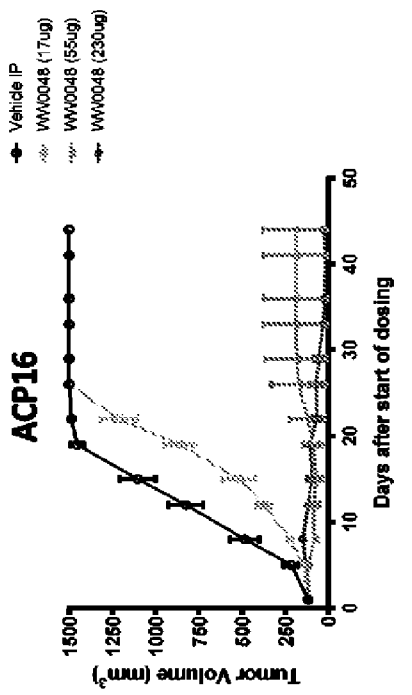

ACP16
Vehicle IP
WW0048 (17ug)
WW0048 (55ug)
WW0048 (230ug)
Tumor Volume (mm³)
0
250
500
750
1000
1250
1500
0
10
20
30
40
50
Days after start of dosing

FIG. 49G

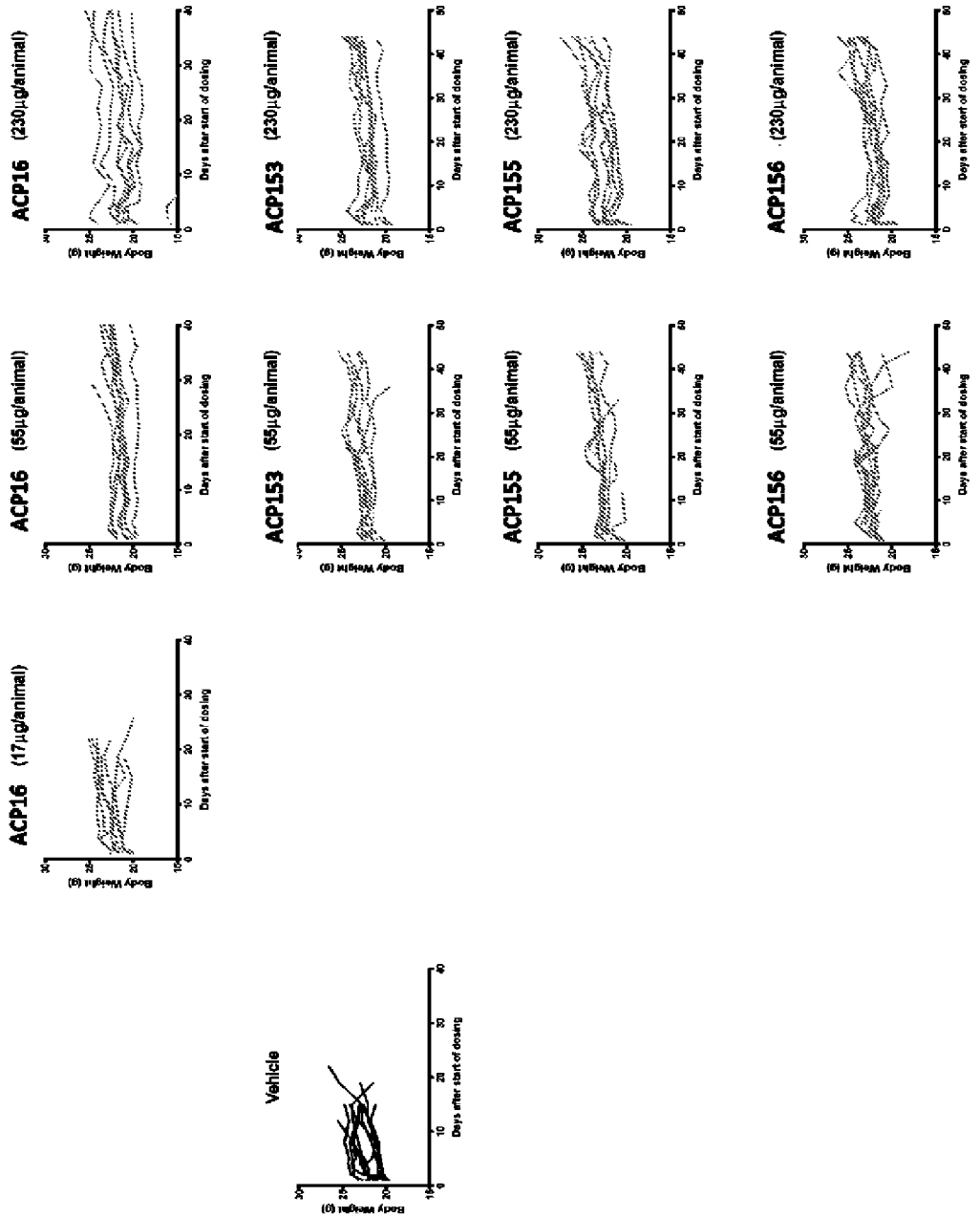

ACP16 (17µg/animal)
ACP16 (55µg/animal)
ACP16 (230µg/animal)
ACP153 (55µg/animal)
ACP153 (230µg/animal)
ACP155 (55µg/animal)
ACP155 (230µg/animal)
ACP156 (55µg/animal)
ACP156 (230µg/animal)
Vehicle
Body Weight (g)
Days after start of dosing

FIG. 49H

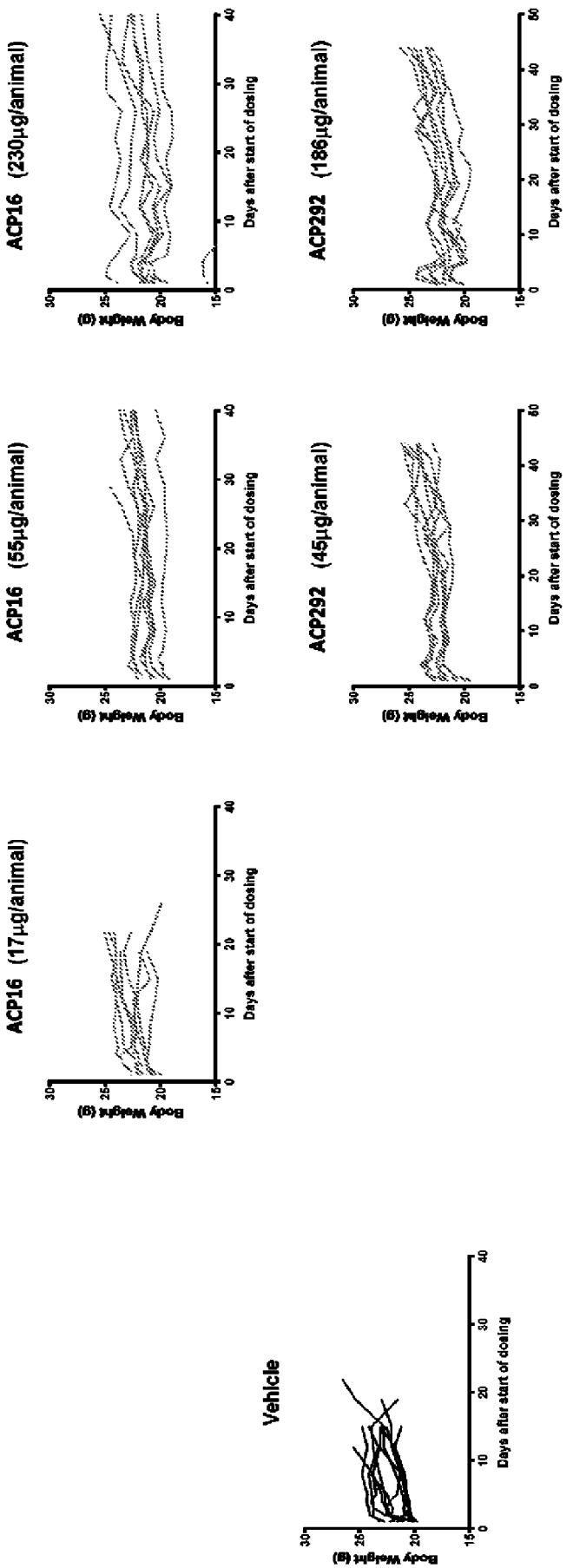

ACP16 (230µg/animal)
ACP292 (186µg/animal)
ACP16 (55µg/animal)
ACP292 (45µg/animal)
ACP16 (17µg/animal)
Vehicle
Body Weight (g)
Days after start of dosing

FIG. 49I

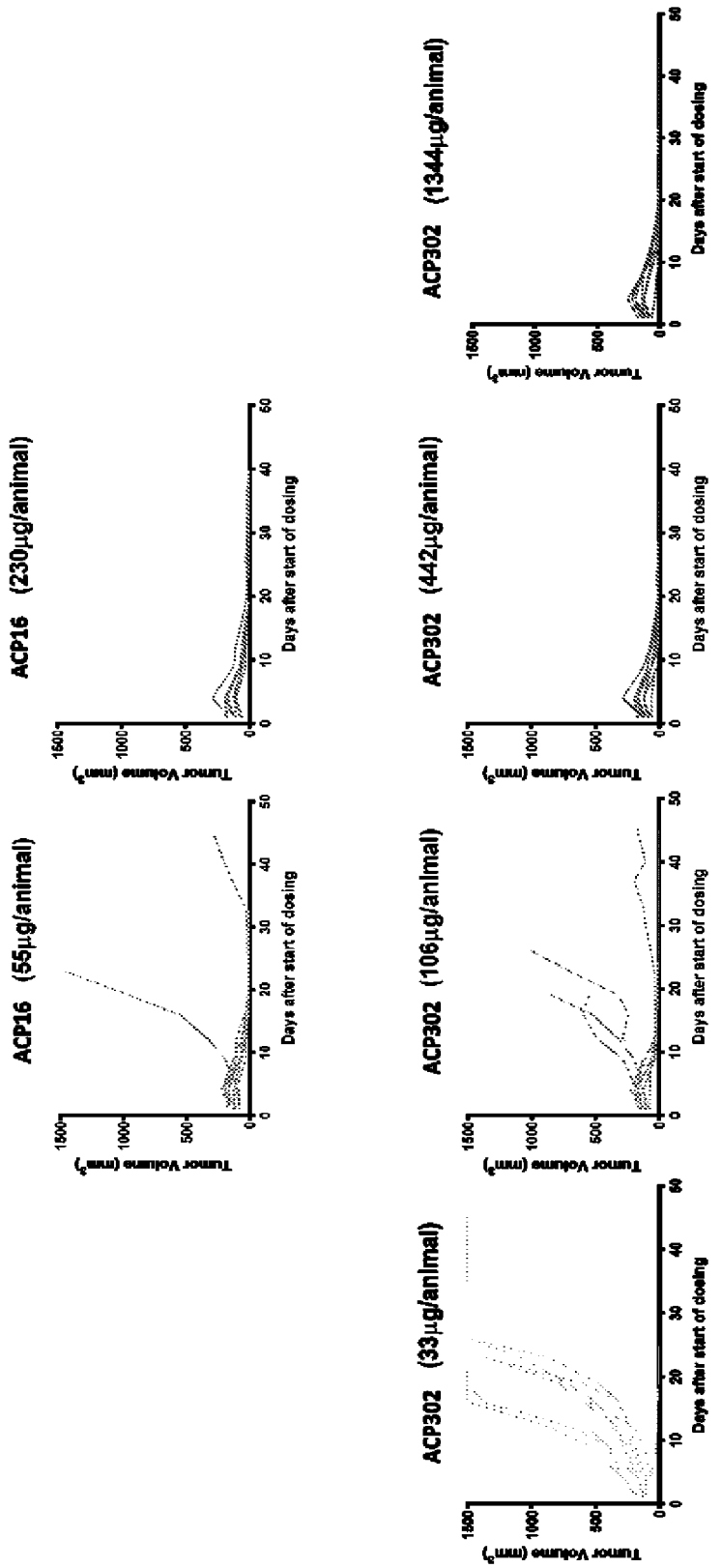

ACP16 (55μg/animal)
ACP16 (230μg/animal)
ACP302 (33μg/animal)
ACP302 (106μg/animal)
ACP302 (442μg/animal)
ACP302 (1344μg/animal)
Tumor Volume (mm³)
Days after start of dosing
0
500
1000
1500
0
10
20
30
40
50
60

FIG. 50A

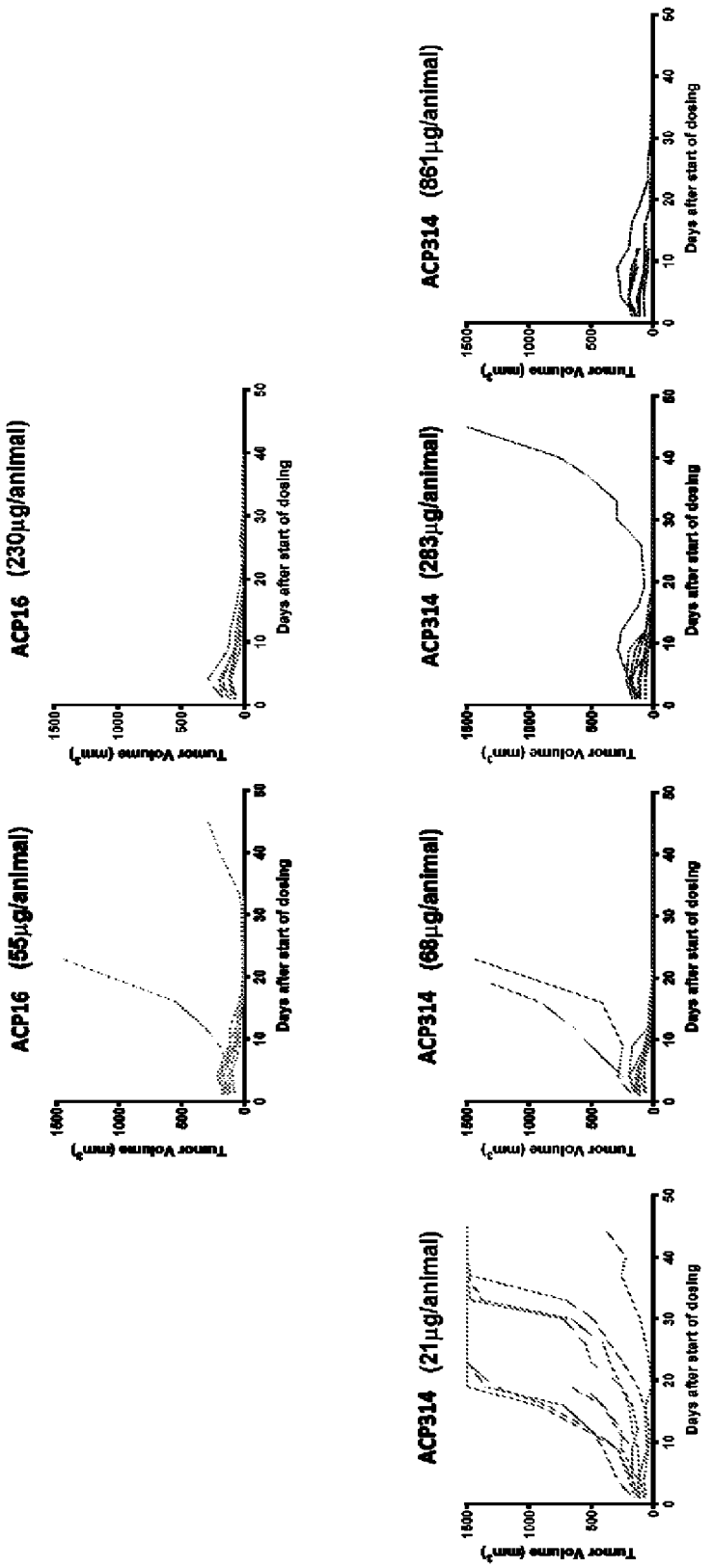

ACP16 (230μg/animal)
ACP16 (55μg/animal)
ACP314 (861μg/animal)
ACP314 (283μg/animal)
ACP314 (68μg/animal)
ACP314 (21μg/animal)
Tumor Volume (mm³)
Days after start of dosing

FIG. 50B

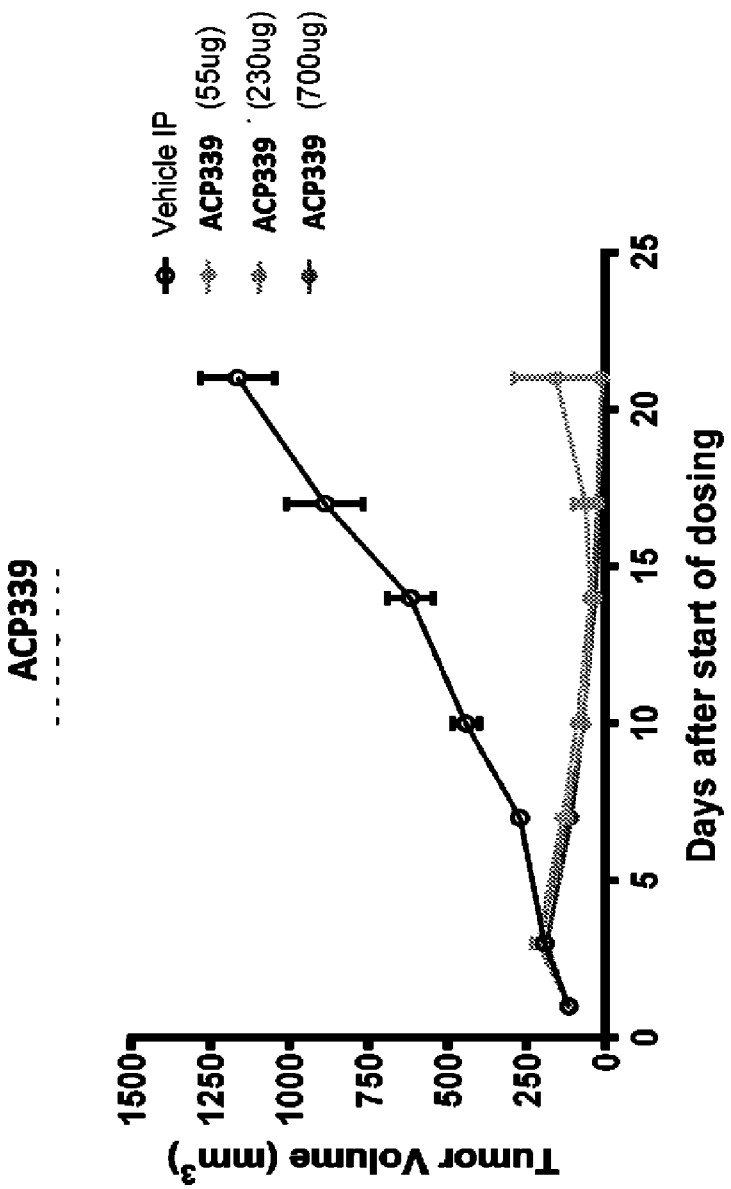
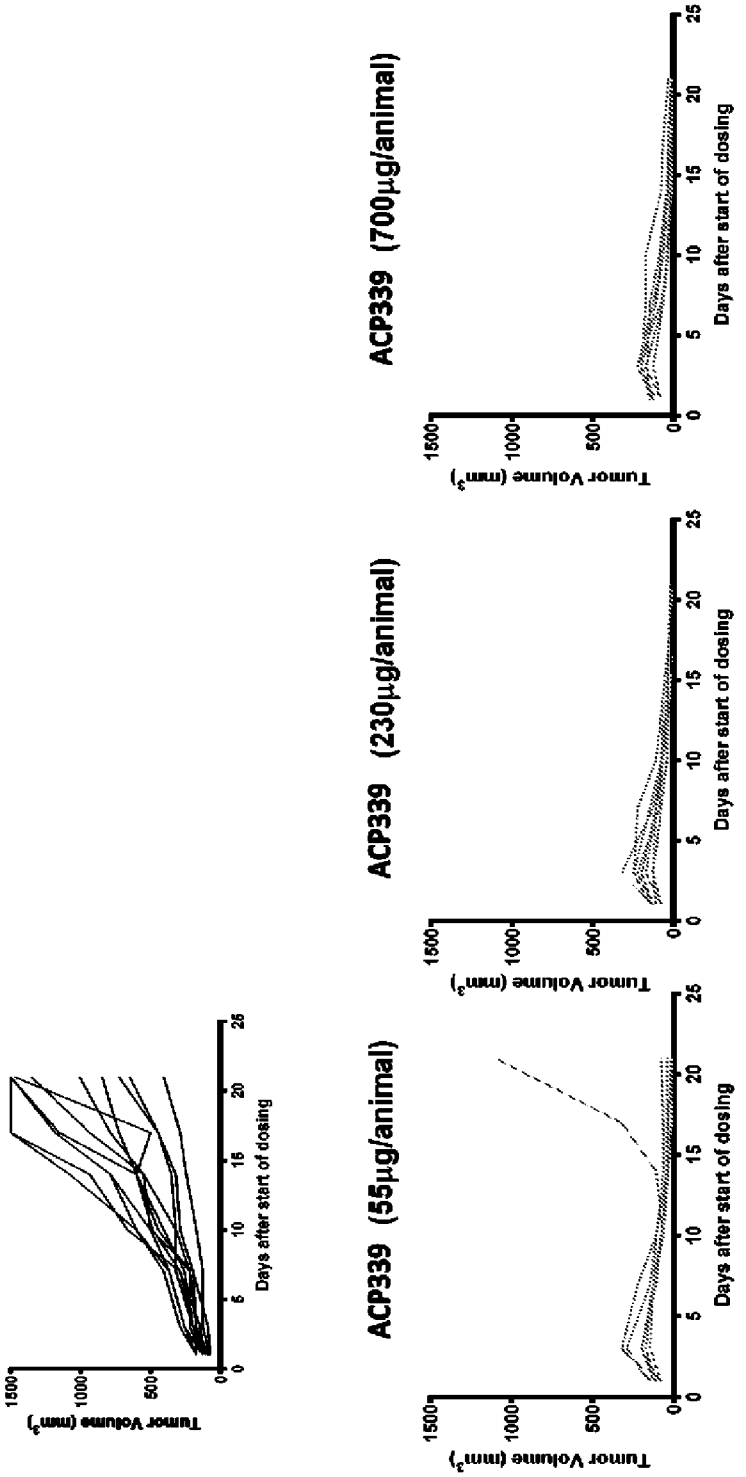

ACP339
Vehicle IP
ACP339 (55ug)
ACP339 (230ug)
ACP339 (700ug)
Tumor Volume (mm3)
1500
1250
1000
750
500
250
0
0
5
10
15
20
25
Days after start of dosing

FIG. 51A

FIG. 51B


Vehicle
ACP339 (55µg/animal)
ACP339 (230µg/animal)
ACP339 (700µg/animal)
Tumor Volume (mm³)
Days after start of dosing
0
500
1000
1500
0
5
10
15
20
25

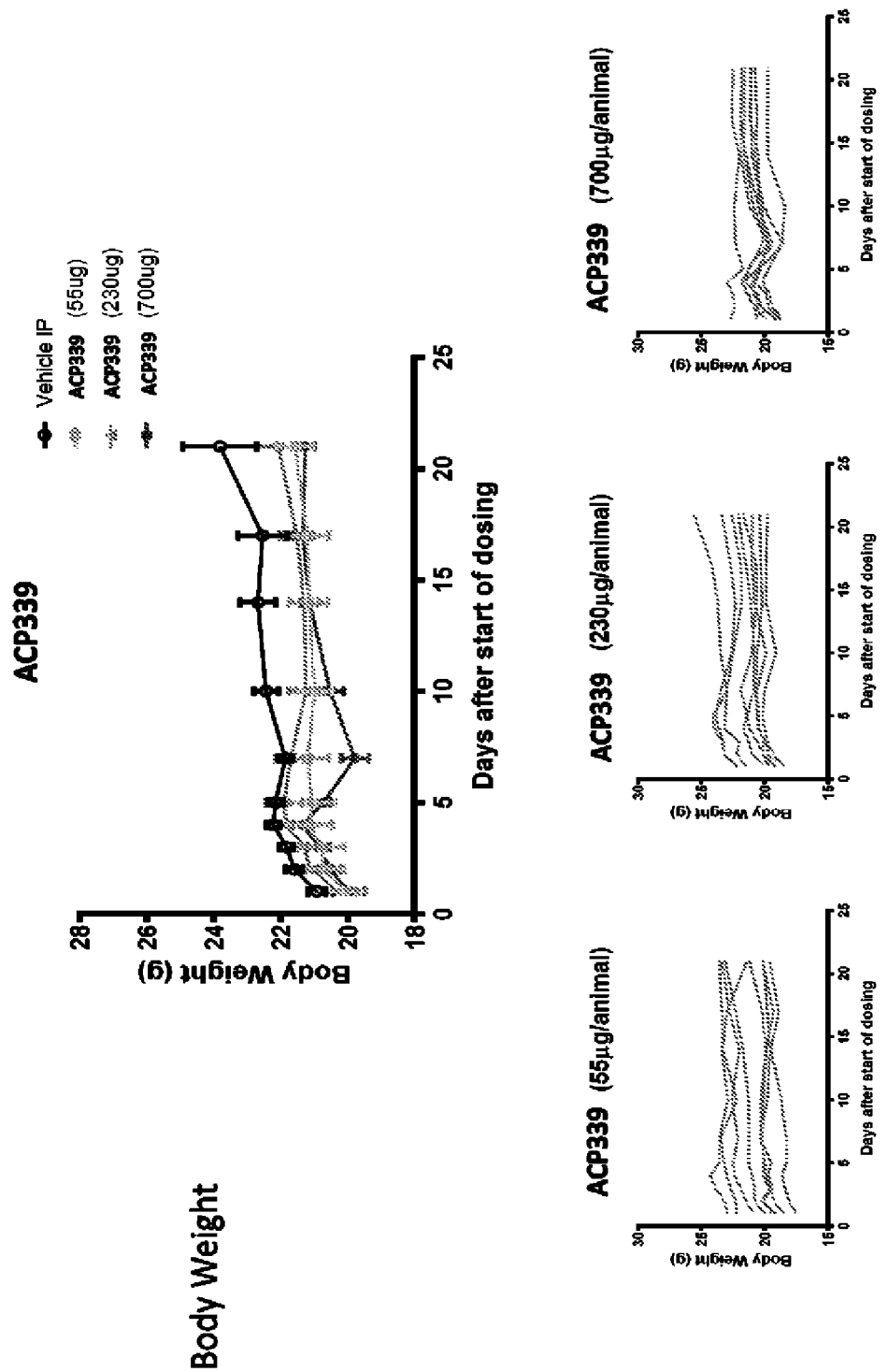
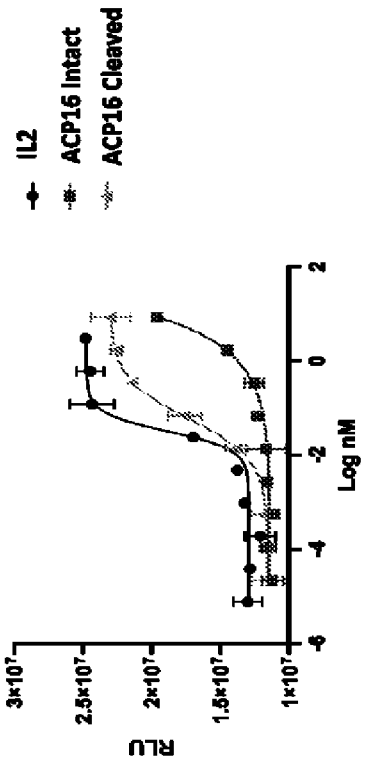

Body Weight
ACP339
Vehicle IP
ACP339 (55ug)
ACP339 (230ug)
ACP339 (700ug)
Body Weight (g)
Days after start of dosing
ACP339 (55µg/animal)
ACP339 (230µg/animal)
ACP339 (700µg/animal)

FIG. 51C


IL2
ACP16 Intact
ACP16 Cleaved
RLU
3×10⁷
2.5×10⁷
2×10⁷
1.5×10⁷
1×10⁷
-6
-4
-2
0
2
Log nM

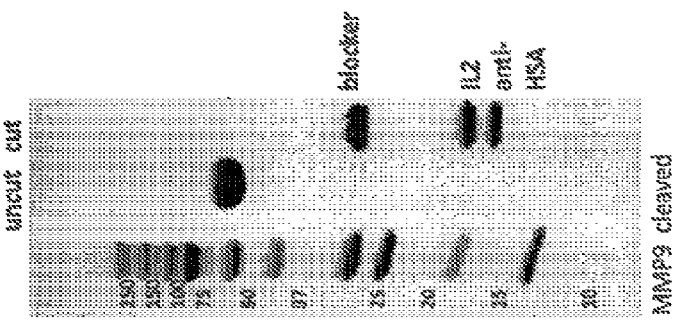

uncut cut
linker
IL2
anti-
HSA
MMP9 cleaved

FIG. 52A

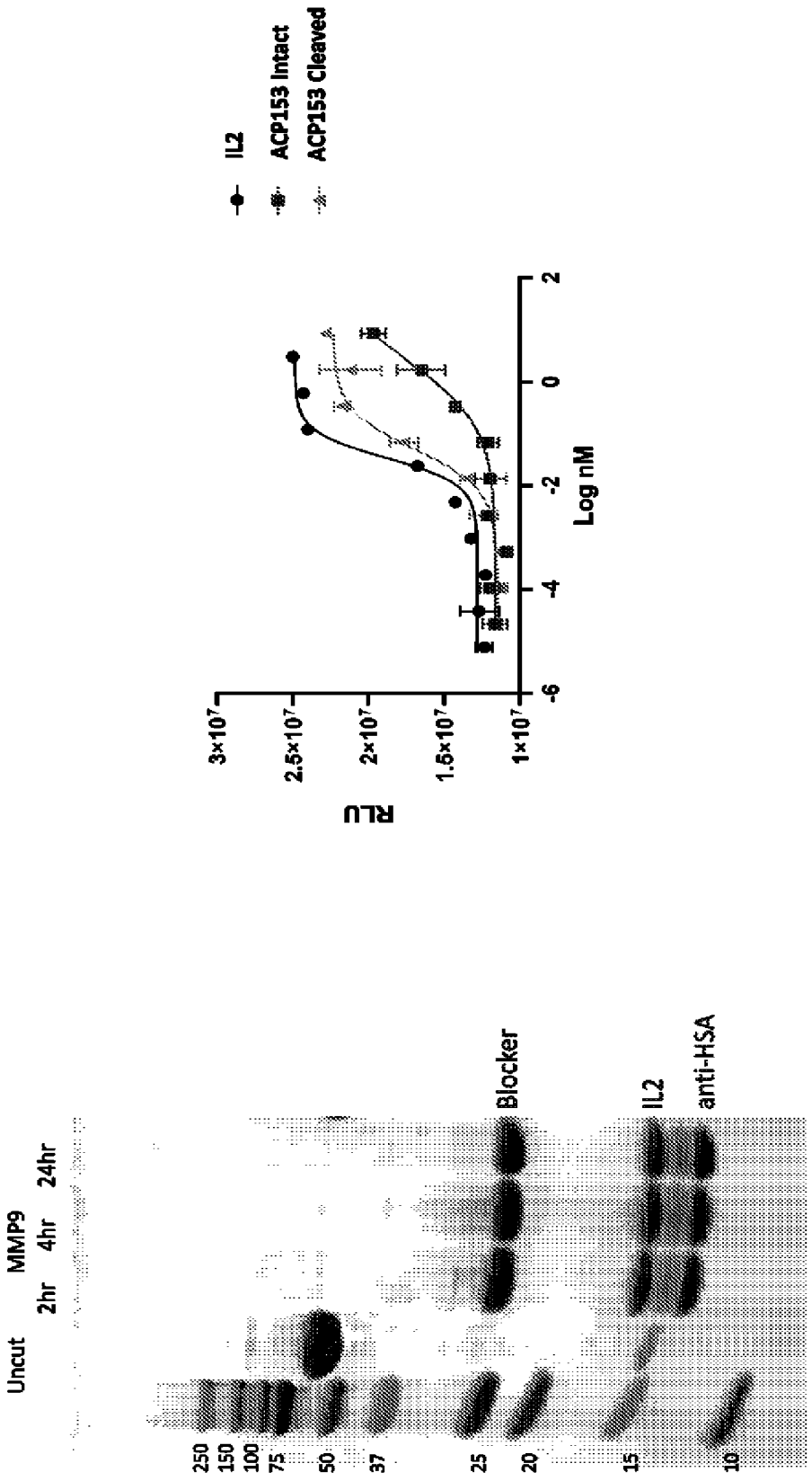

Uncut
MMP9
2hr
4hr
24hr
250
150
100
75
50
37
25
20
15
10
Blocker
IL2
anti-HSA
IL2
ACP153 Intact
ACP153 Cleaved
RLU
3×10^7
2.5×10^7
2×10^7
1.5×10^7
1×10^7
-6
-4
-2
0
2
Log nM

FIG. 52B

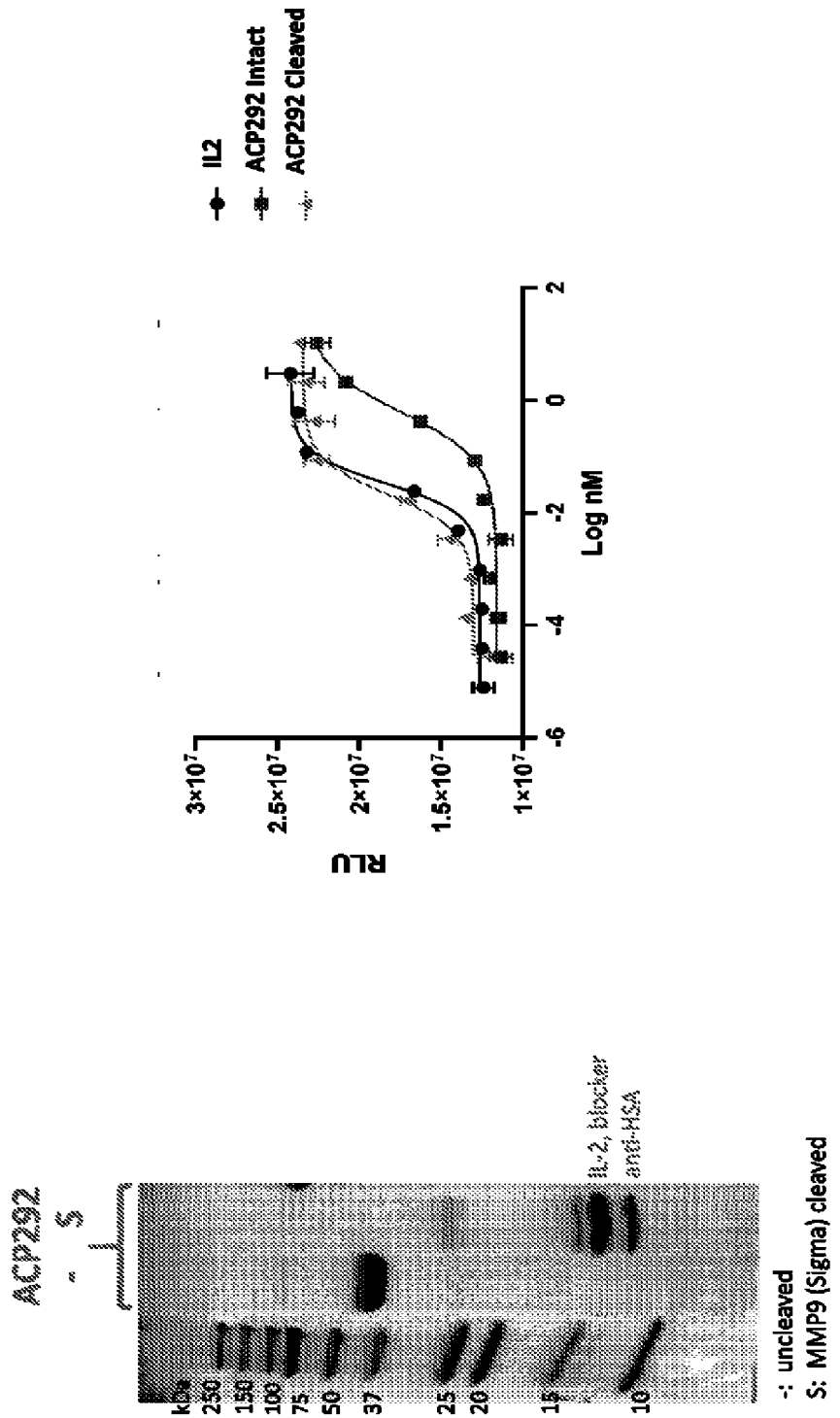
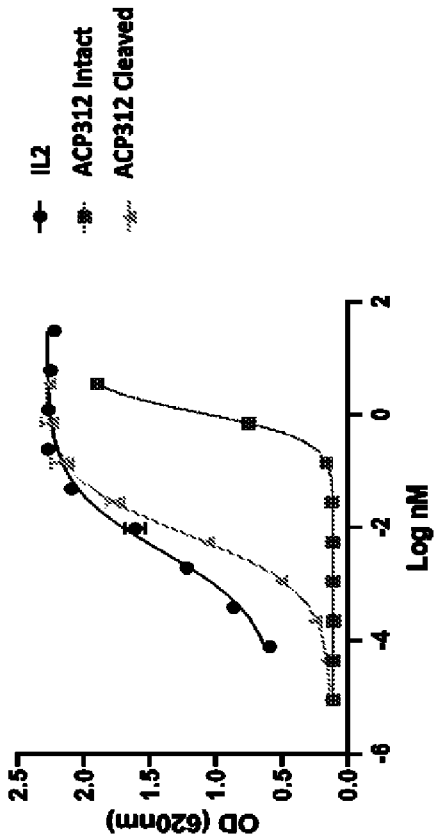

IL2
ACP292 Intact
ACP292 Cleaved
RLU
3x10^7
2.5x10^7
2x10^7
1.5x10^7
1x10^7
-6
-4
-2
0
2
Log nM
ACP292
-
S
kDa
250
150
100
75
50
37
25
20
15
10
IL-2, blocker
anti-HSA
-: uncleaved
S: MMP9 (Sigma) cleaved

FIG. 52C


IL2
ACP312 Intact
ACP312 Cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM

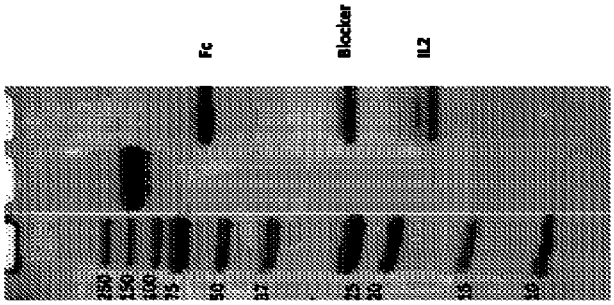
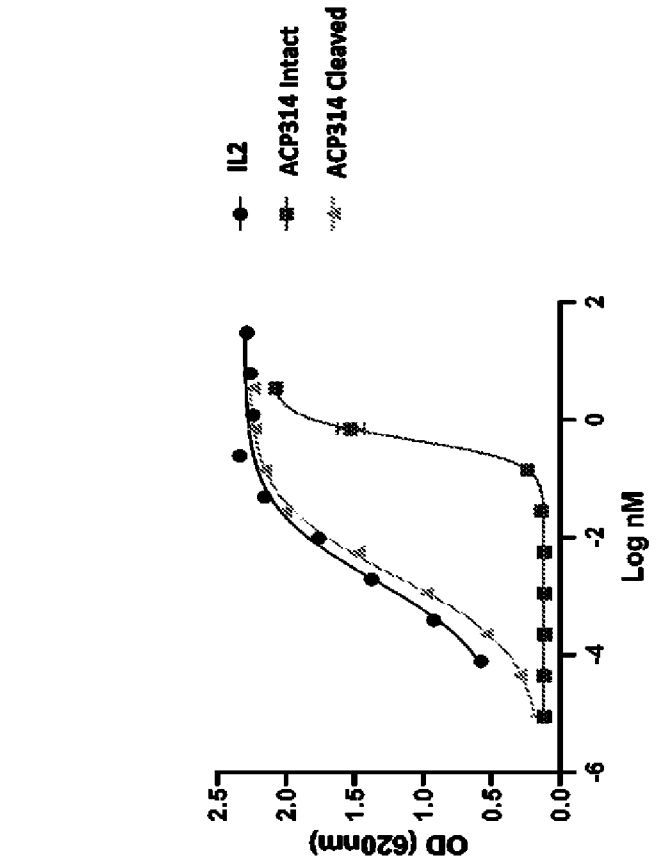

uncut
cut
Fc
Blocker
IL2

FIG. 52D


IL2
ACP314 Intact
ACP314 Cleaved
OD (620nm)
Log nM
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2

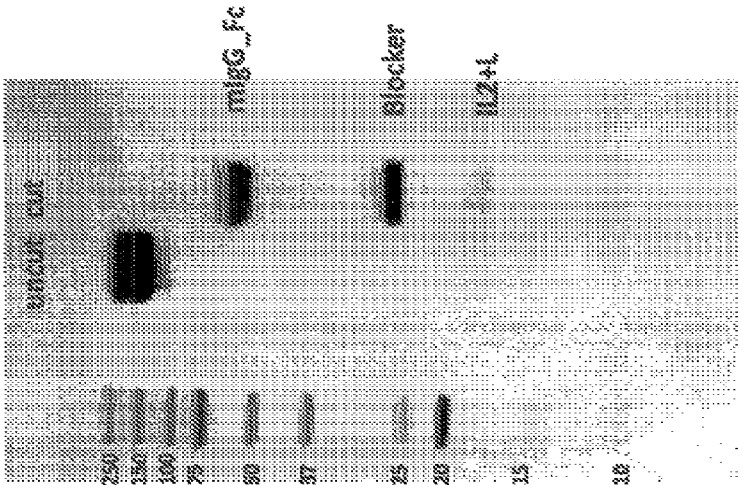

mIgG_Fc
Blocker
M2+L
MMP9 cleaved
250
150
100
75
50
37
25
20
15
10

FIG. 52E

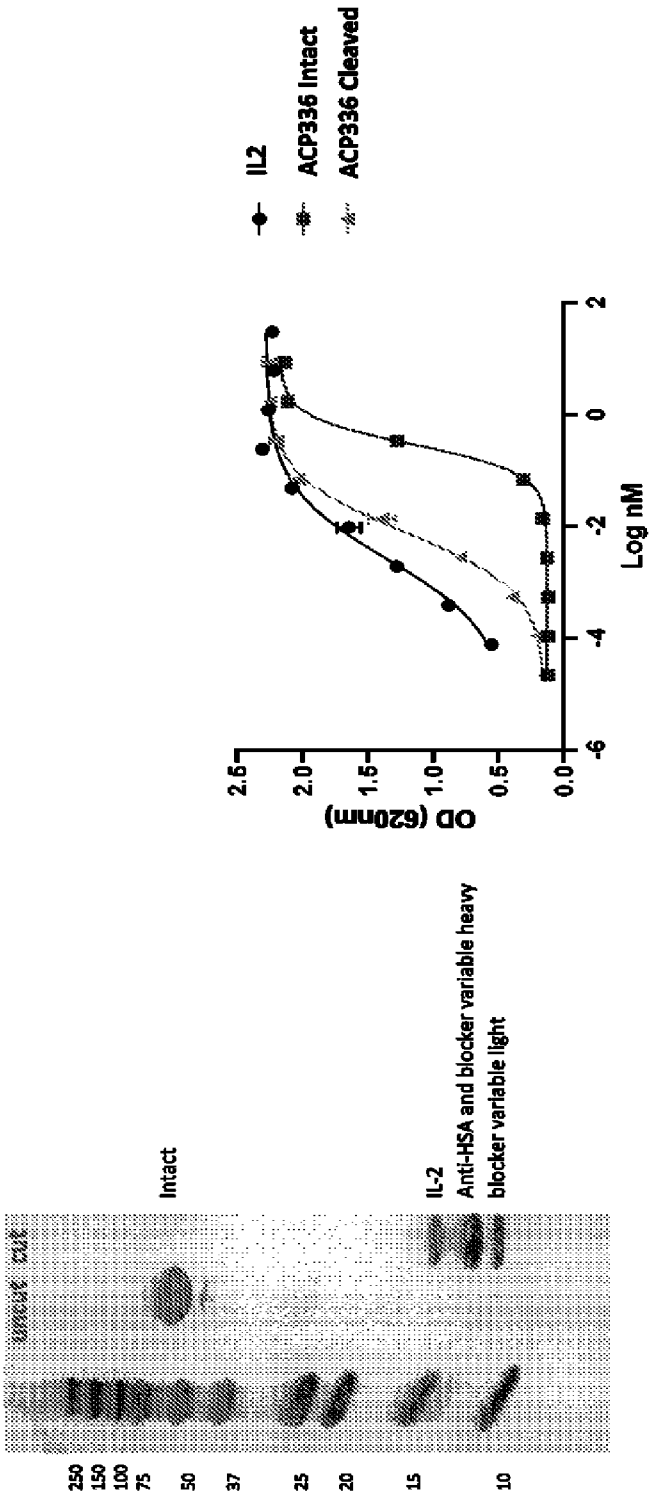

IL2
ACP336 Intact
ACP336 Cleaved
OD (620nm)
Log nM
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Intact
IL-2
Anti-HSA and blocker variable heavy
blocker variable light
250
150
100
75
50
37
25
20
15
10

FIG. 52F

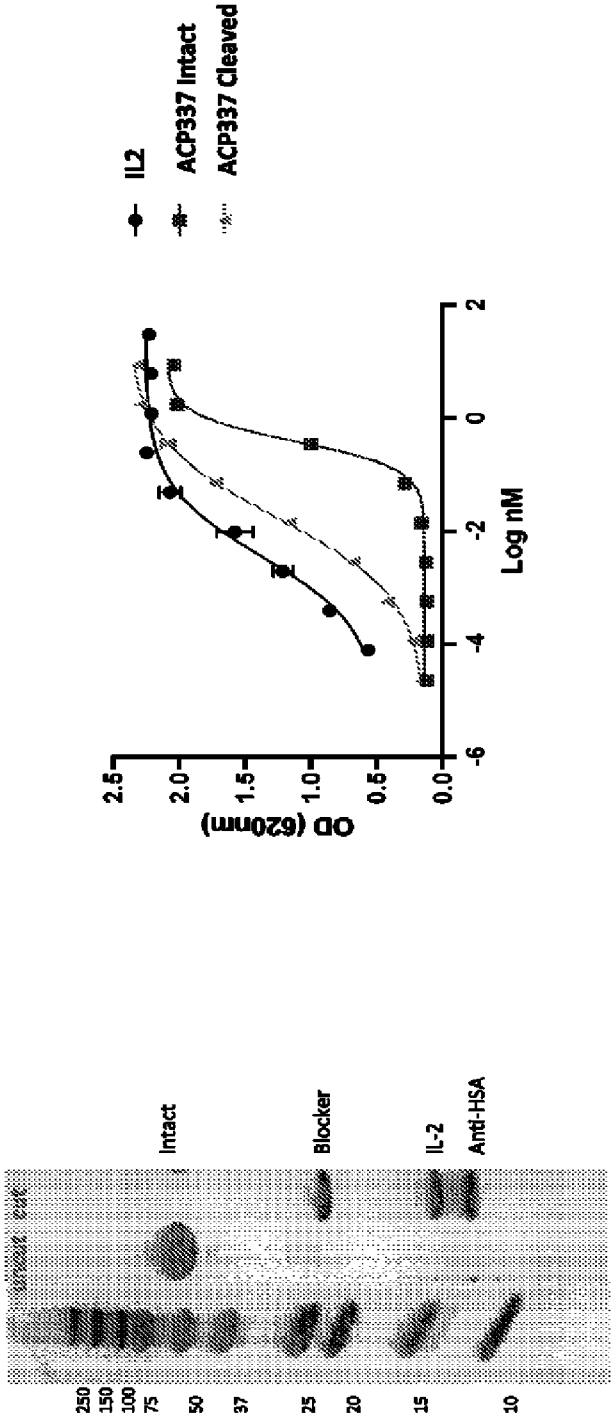

IL2
ACP337 Intact
ACP337 Cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM
Intact
Blocker
IL-2
Anti-HSA
250
150
100
75
50
37
25
20
15
10

FIG. 52G

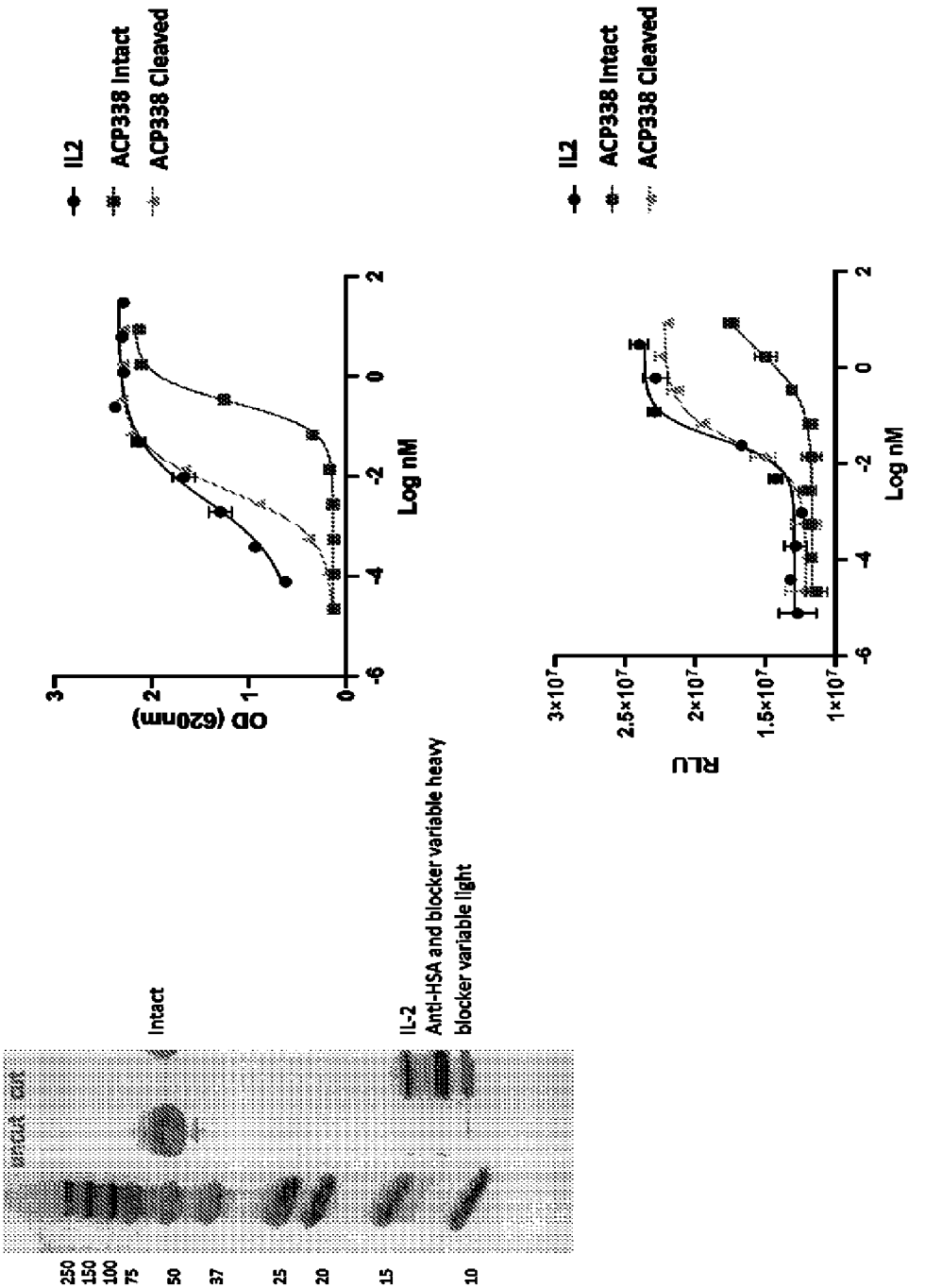
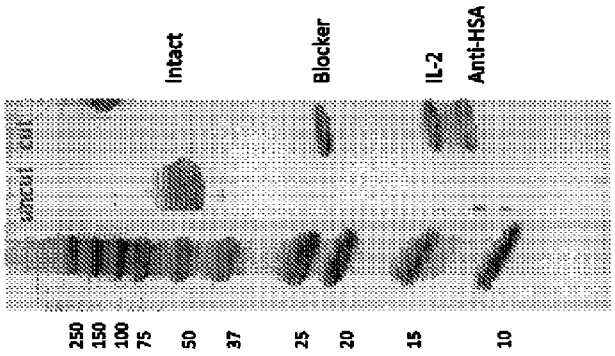
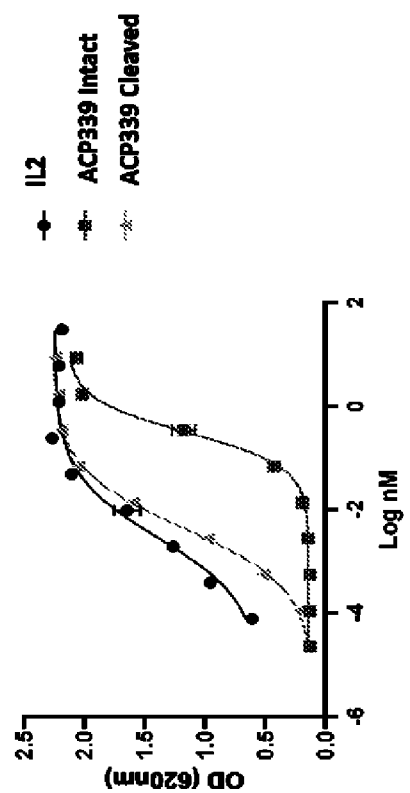

IL2
ACP338 Intact
ACP338 Cleaved
OD (620nm)
Log nM
RLU
Intact
IL-2
Anti-HSA and blocker variable heavy
blocker variable light
250
150
100
75
50
37
25
20
15
10

FIG. 52H


Intact
Blocker
IL-2
Anti-HSA
250
150
100
75
50
37
25
20
15
10


IL2
ACP339 Intact
ACP339 Cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM

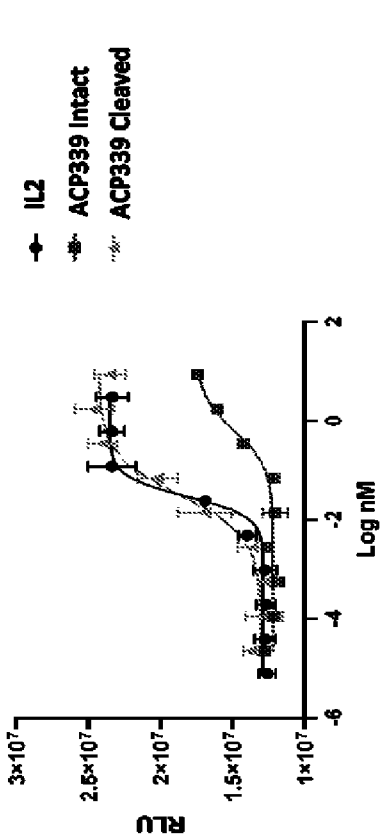

IL2
ACP339 Intact
ACP339 Cleaved
RLU
3×10^7
2.5×10^7
2×10^7
1.5×10^7
1×10^7
-6
-4
-2
0
2
Log nM

FIG. 52I

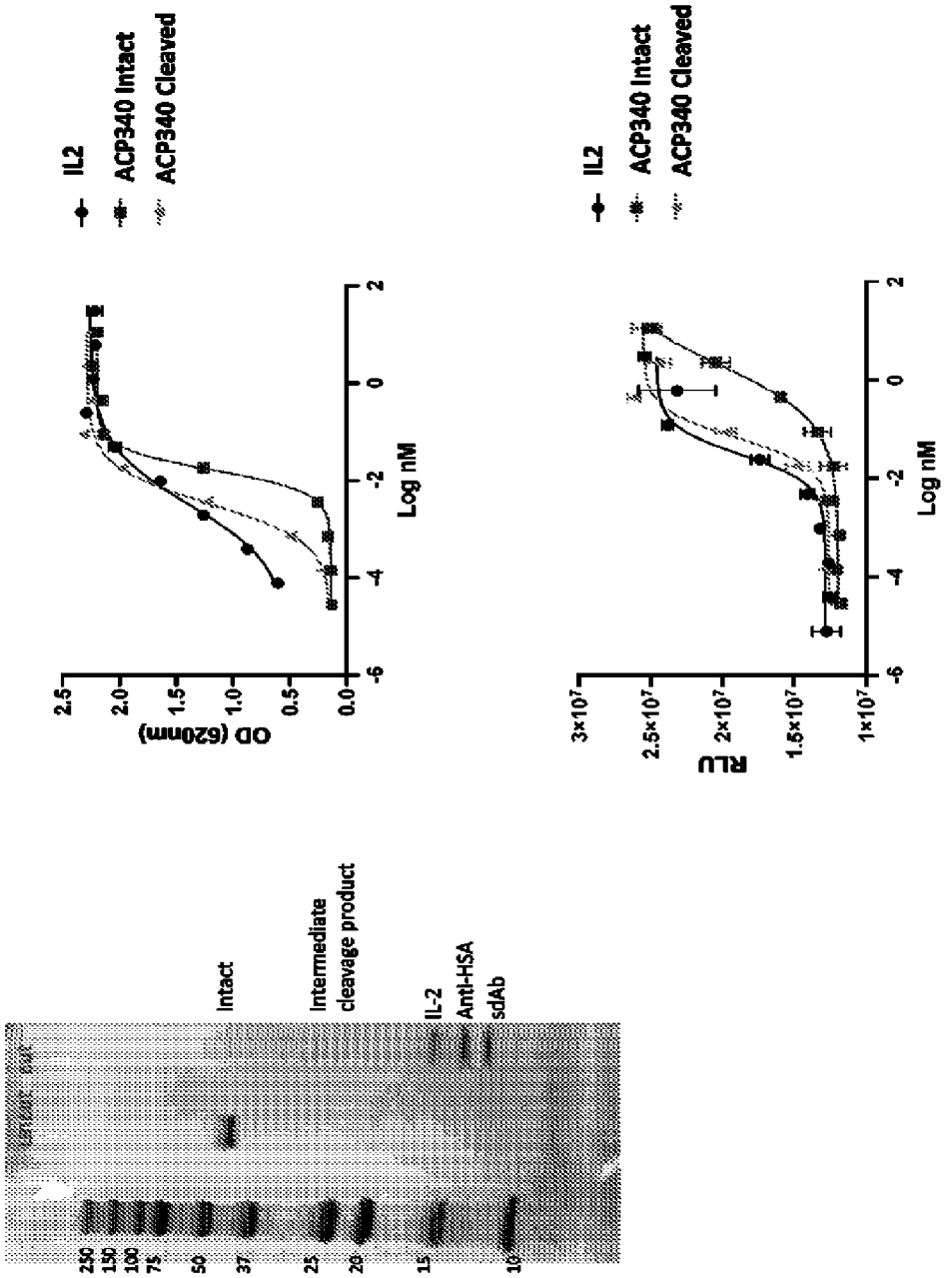
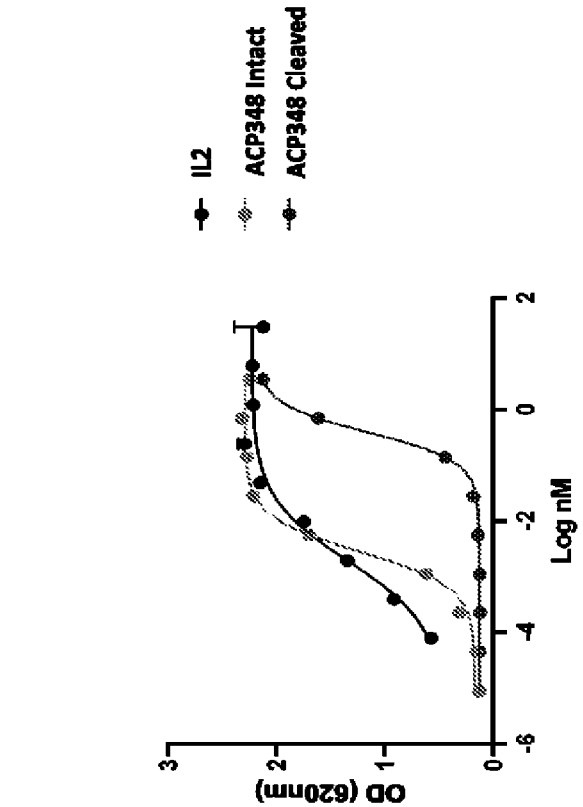

IL2
ACP340 Intact
ACP340 Cleaved
OD (620nm)
Log nM
RLU
Log nM
Intact
Intermediate cleavage product
IL-2
Anti-HSA sdAb
250
150
100
75
50
37
25
20
15
10

FIG. 52J


IL2
ACP348 Intact
ACP348 Cleaved
OD (620nm)
Log nM

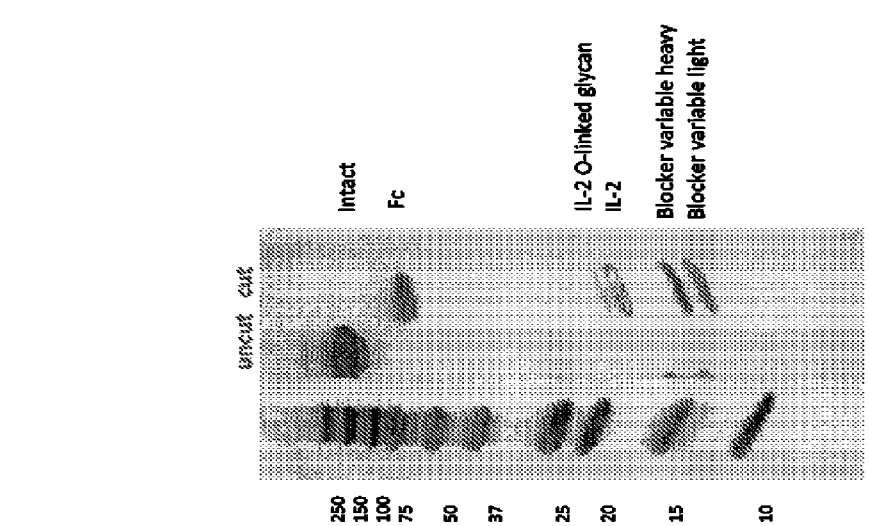

uncut
cut
Intact
Fc
IL-2 O-linked glycan
IL-2
Blocker variable heavy
Blocker variable light
250
150
100
75
50
37
25
20
15
10

FIG. 52K

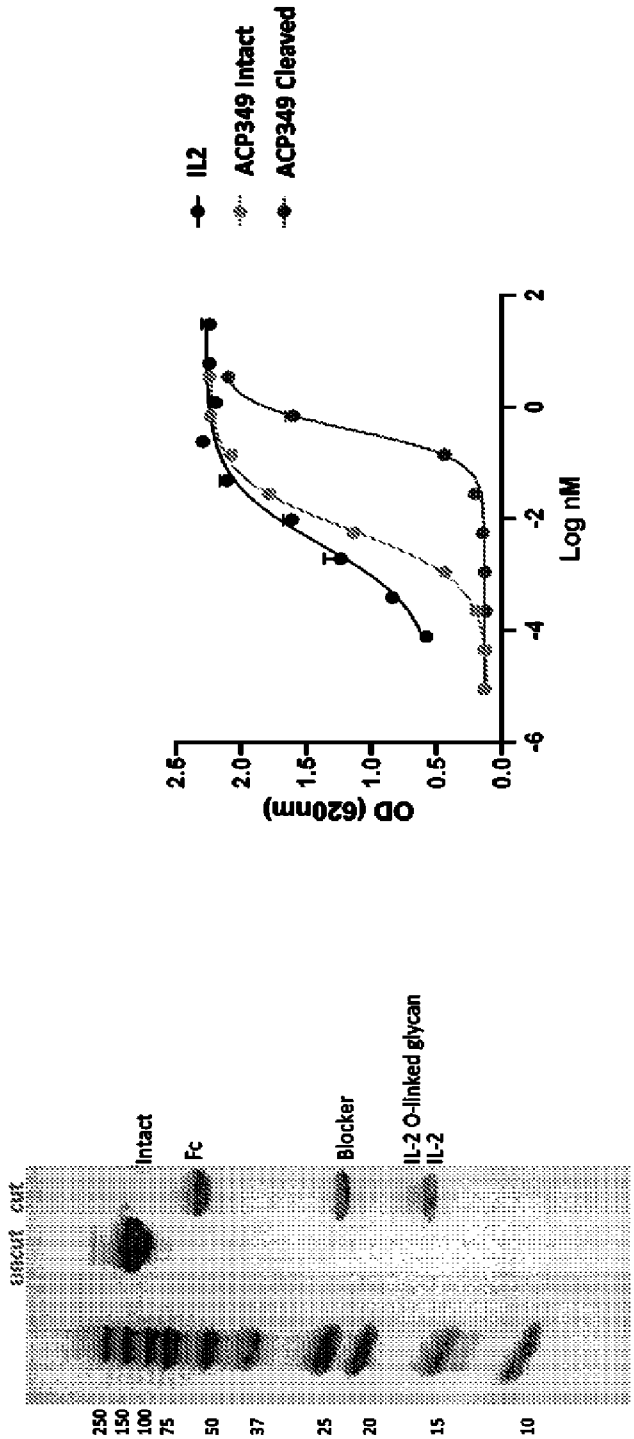

IL2
ACP349 Intact
ACP349 Cleaved
OD (620nm)
Log nM
Intact
Fc
Blocker
IL-2 O-linked glycan
IL-2

FIG. 52L

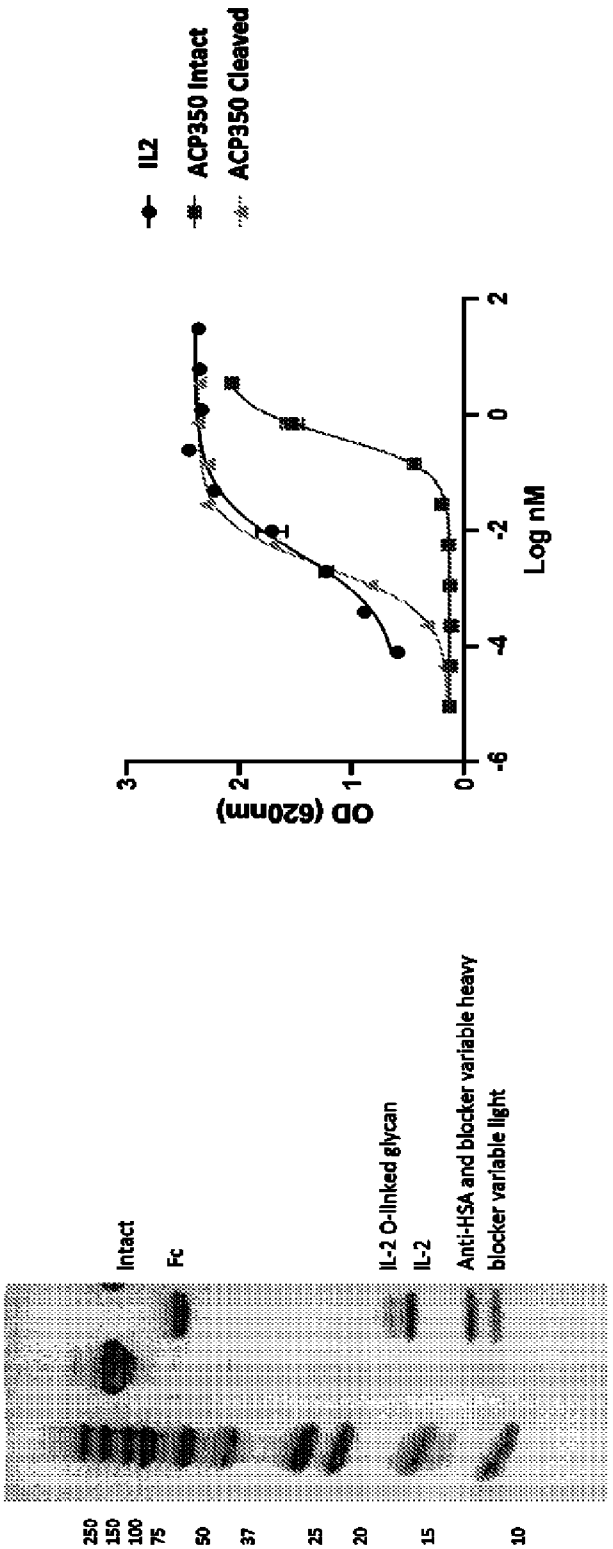
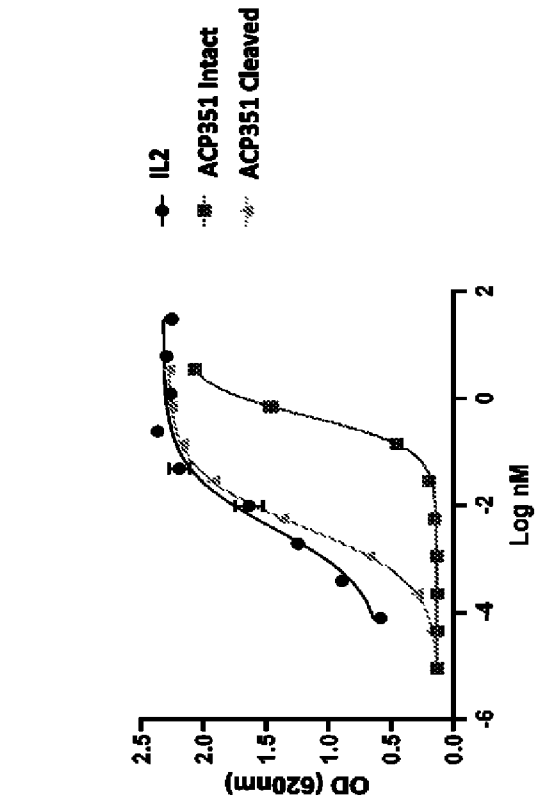

IL2
ACP350 Intact
ACP350 Cleaved
OD (620nm)
Log nM
Intact
Fc
IL-2 O-linked glycan
IL-2
Anti-HSA and blocker variable heavy
blocker variable light
250
150
100
75
50
37
25
20
15
10

FIG. 52M


IL2
ACP351 Intact
ACP351 Cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM

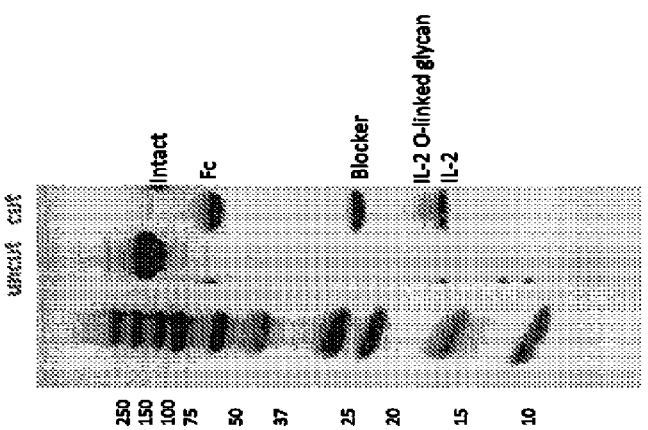

Intact
Fc
Blocker
IL-2 O-linked glycan
IL-2
250
150
100
75
50
37
25
20
15
10

FIG. 52N

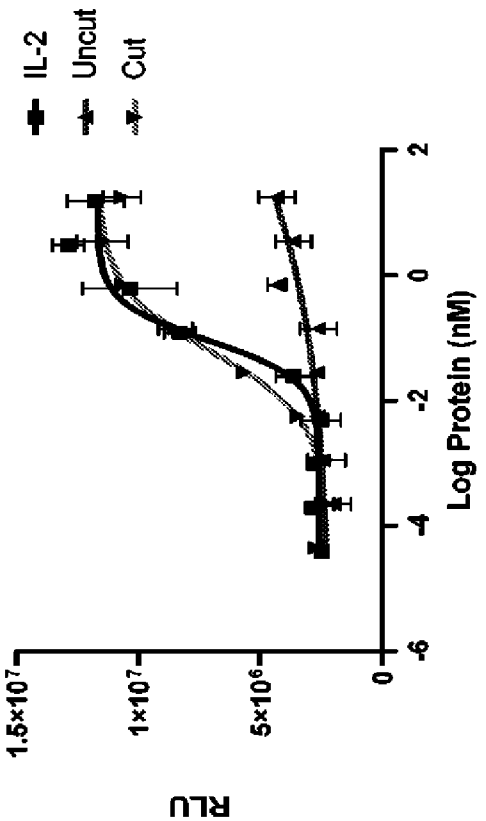


FIG. 53A

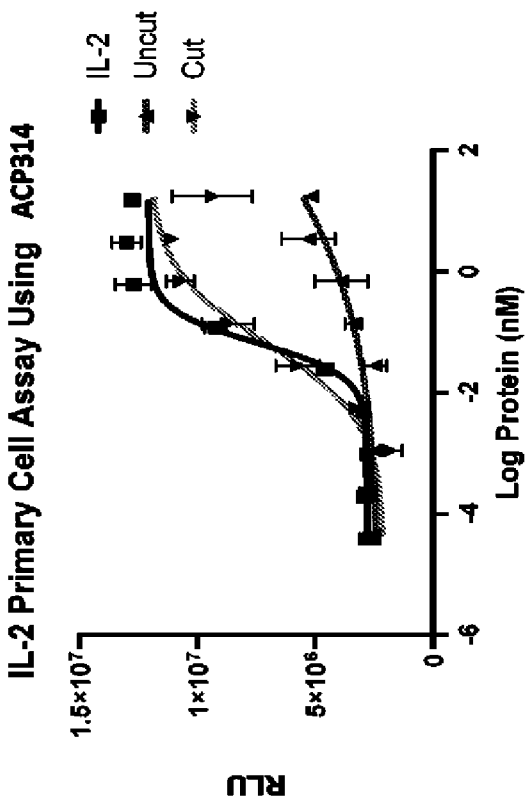
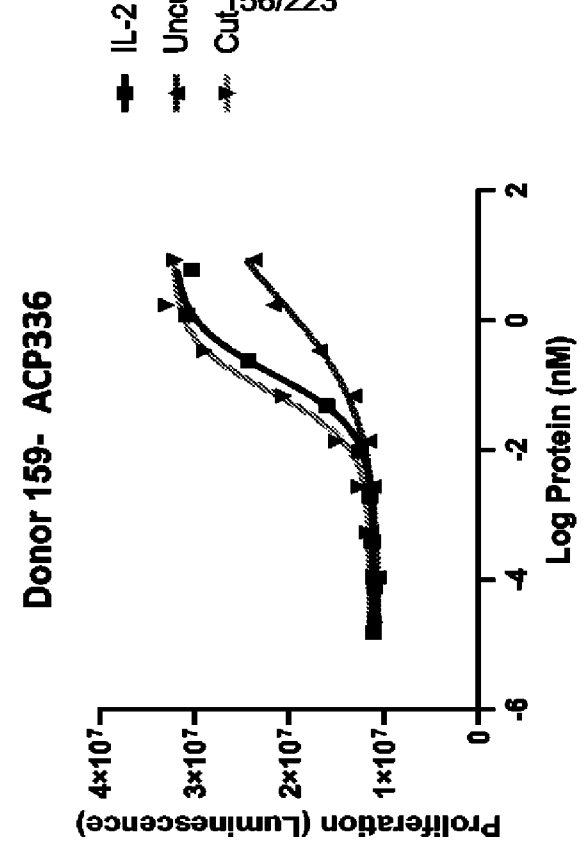

IL-2 Primary Cell Assay Using ACP314
IL-2
Uncut
Cut
RLU
1.5×10^7
1×10^7
5×10^6
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 53B


Donor 159- ACP336
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

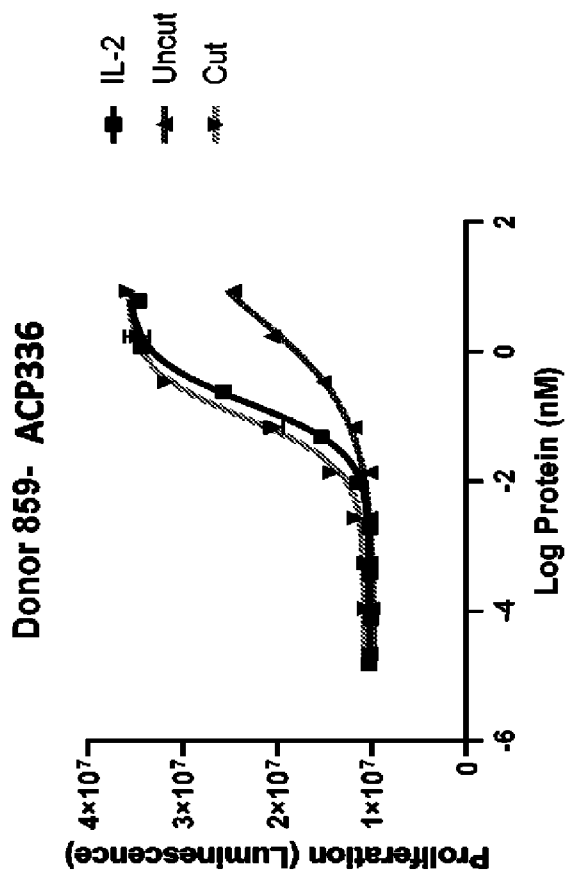
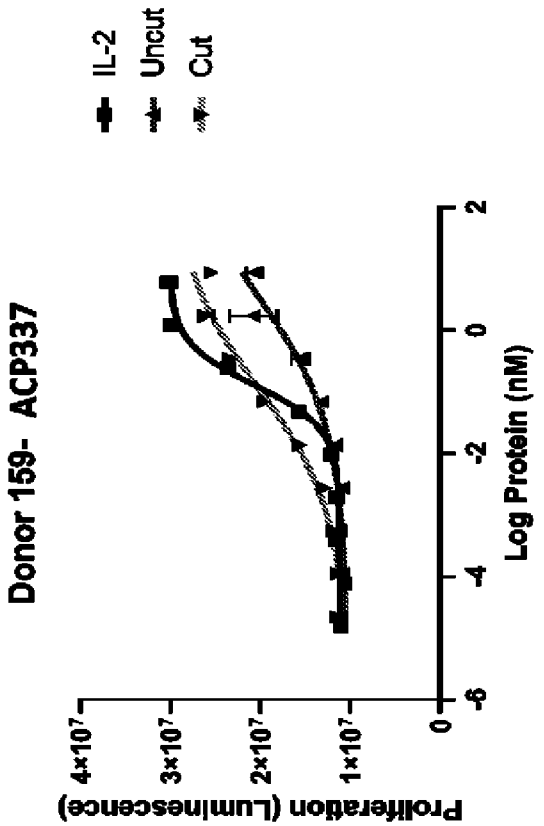

Donor 859- ACP336
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54A


Donor 159- ACP337
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

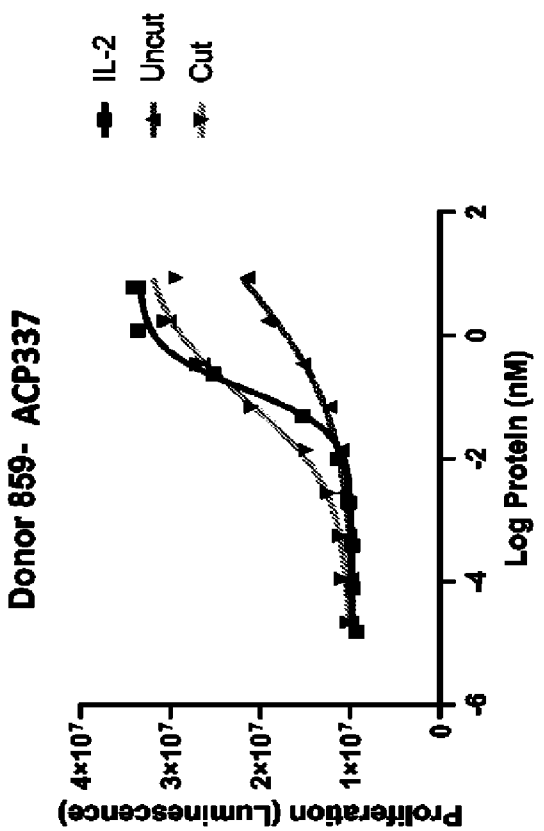
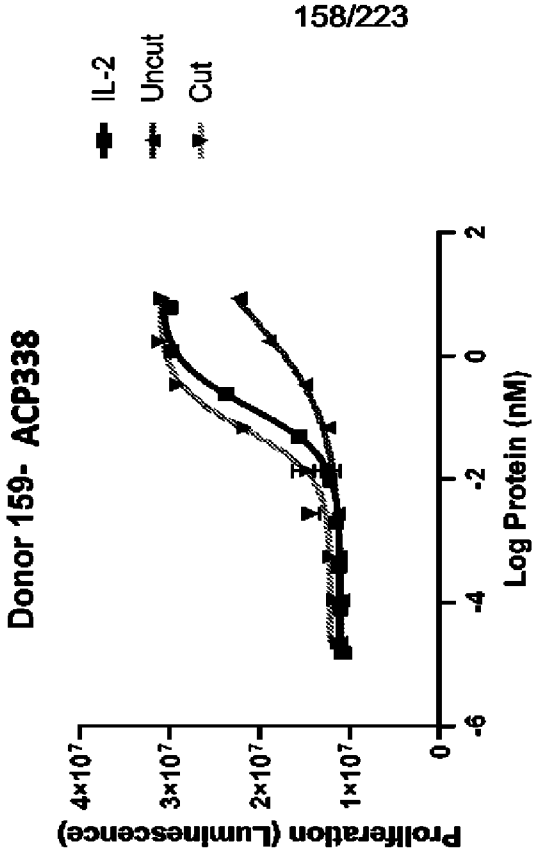

Donor 859- ACP337
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54B


Donor 159- ACP338
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

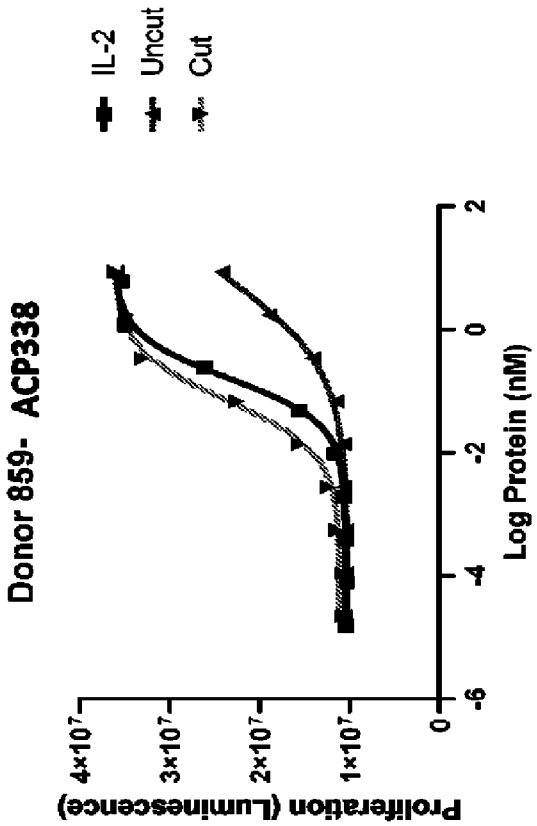
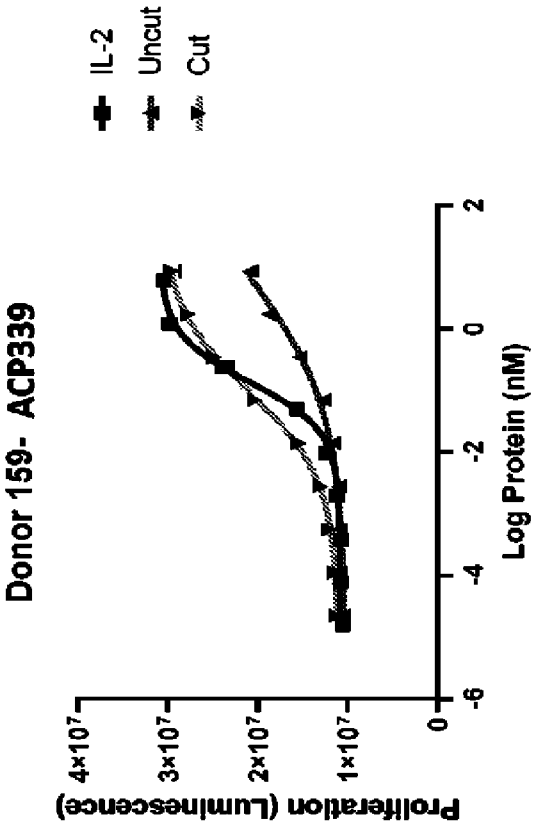

Donor 859- ACP338
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54C


Donor 159- ACP339
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

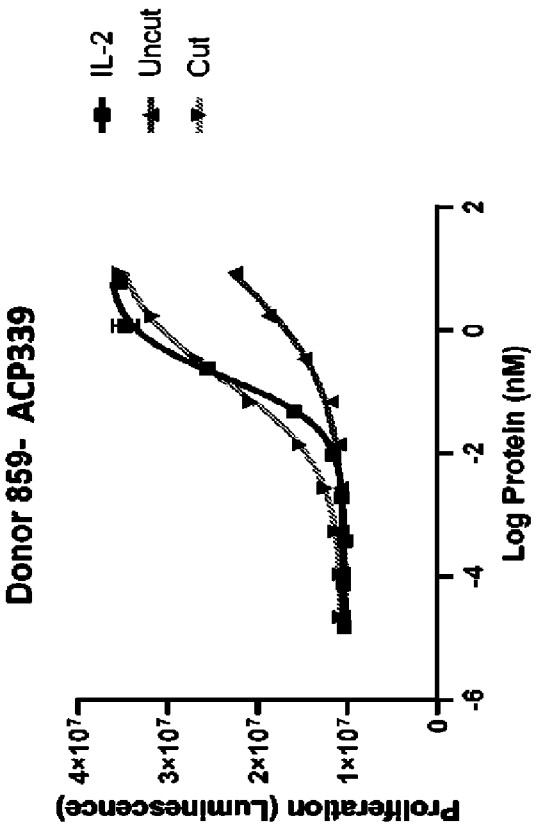
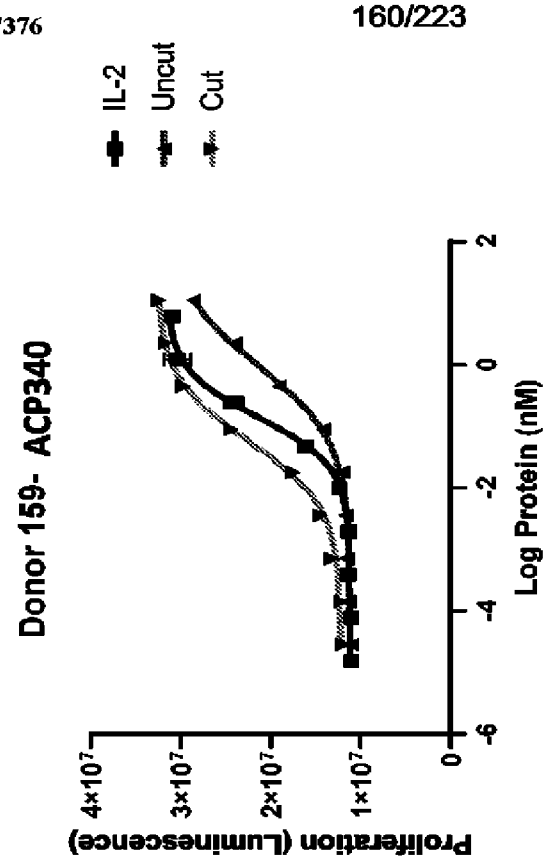

Donor 859- ACP339
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54D


Donor 159- ACP340
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

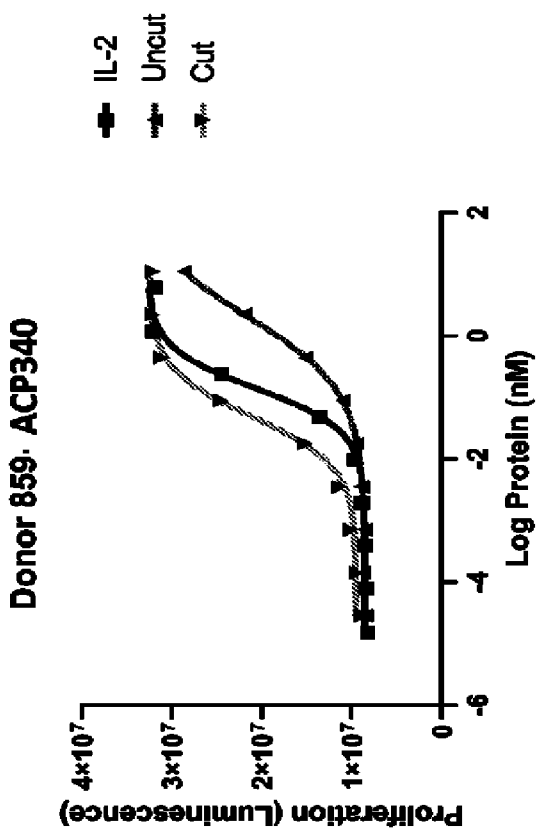
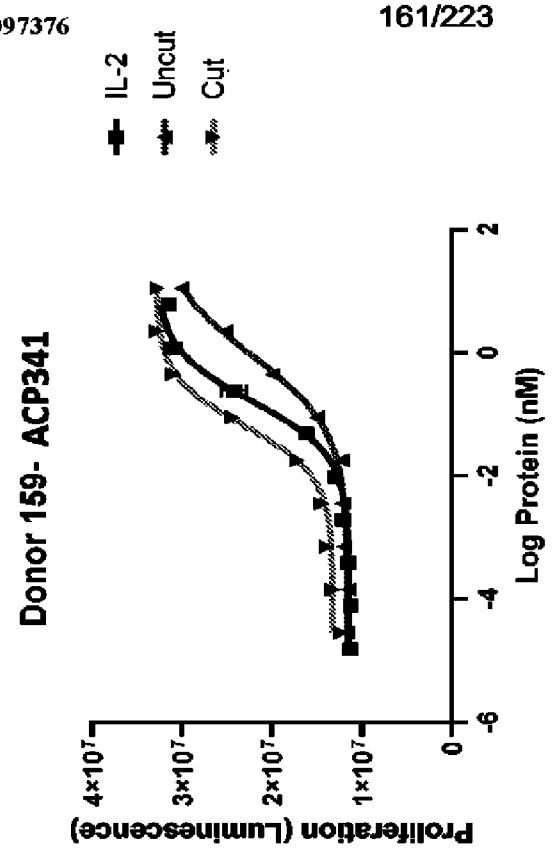

Donor 859- ACP340
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54E


Donor 159- ACP341
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

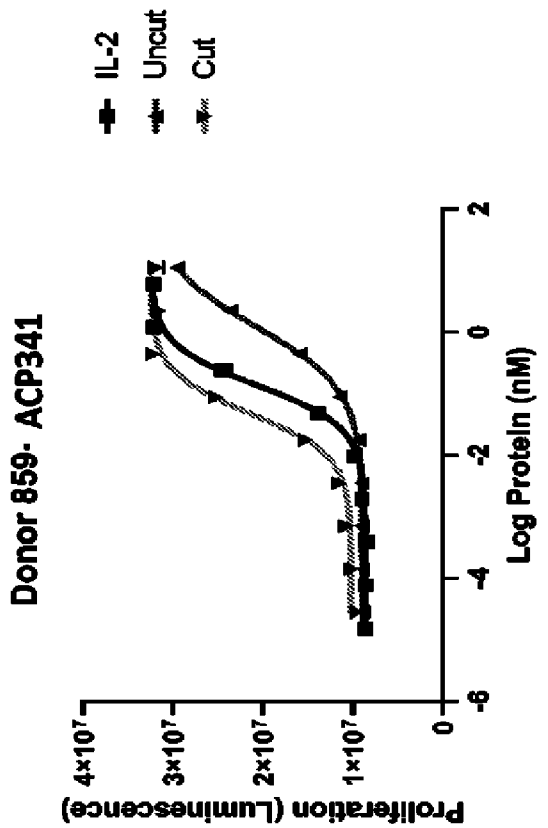

Donor 859- ACP341
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54F

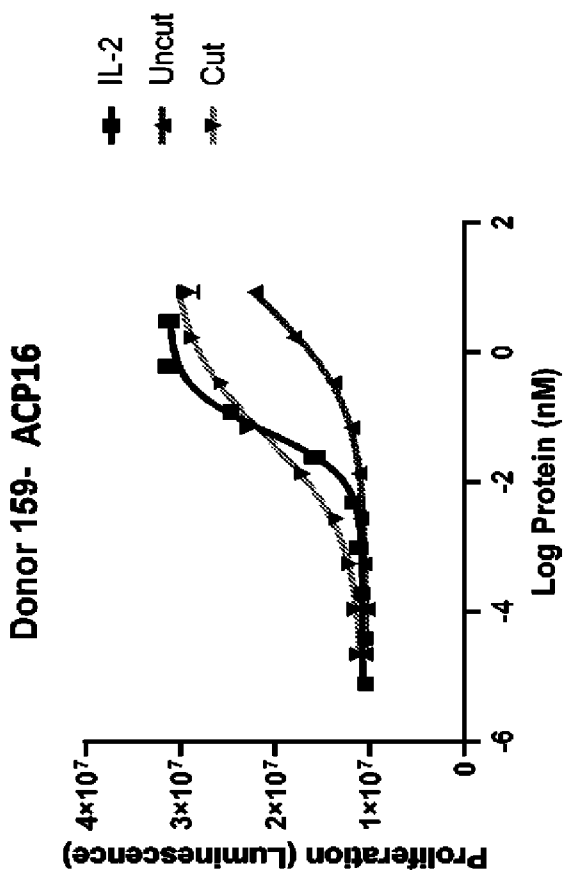

Donor 159- ACP16
IL-2
Uncut
Cut
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54G

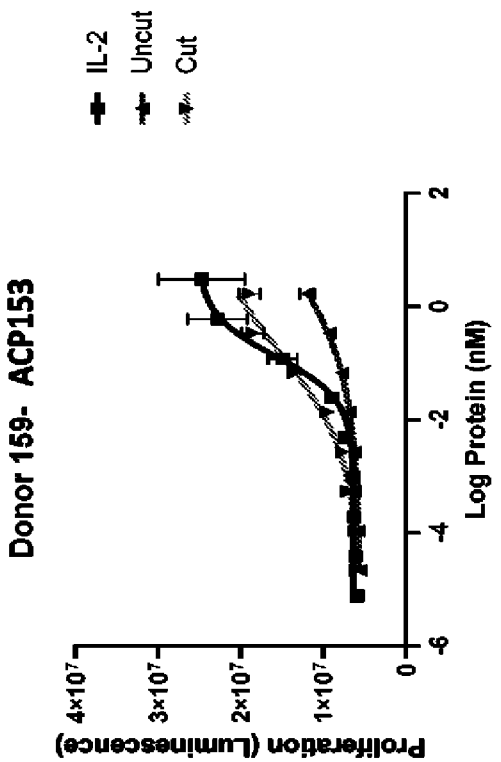

IL-2
Uncut
Cut
Donor 159- ACP153
Proliferation (Luminescence)
4×10^7
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54H

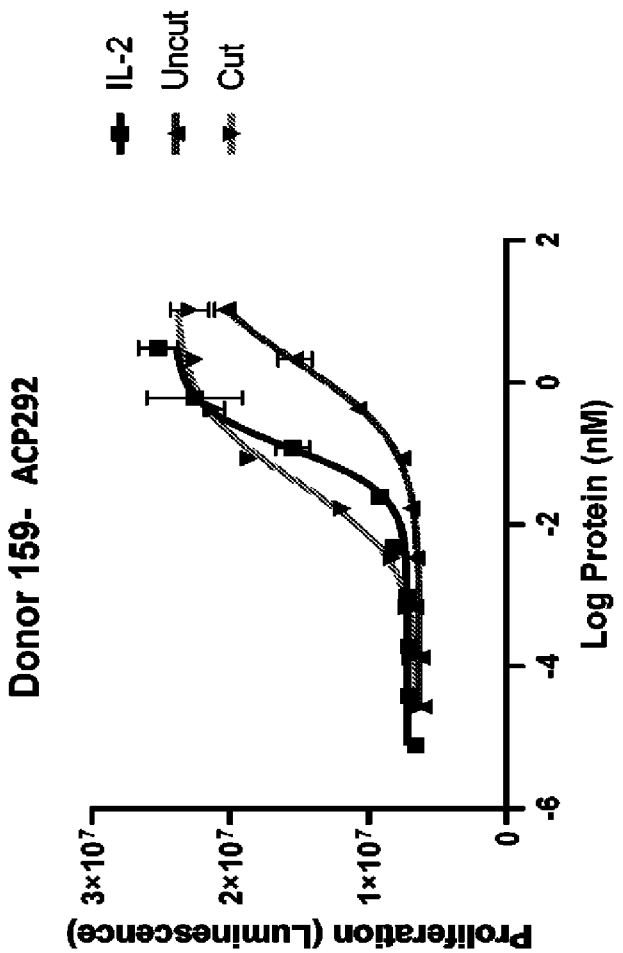

Donor 159- ACP292
IL-2
Uncut
Cut
Proliferation (Luminescence)
3×10^7
2×10^7
1×10^7
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54I

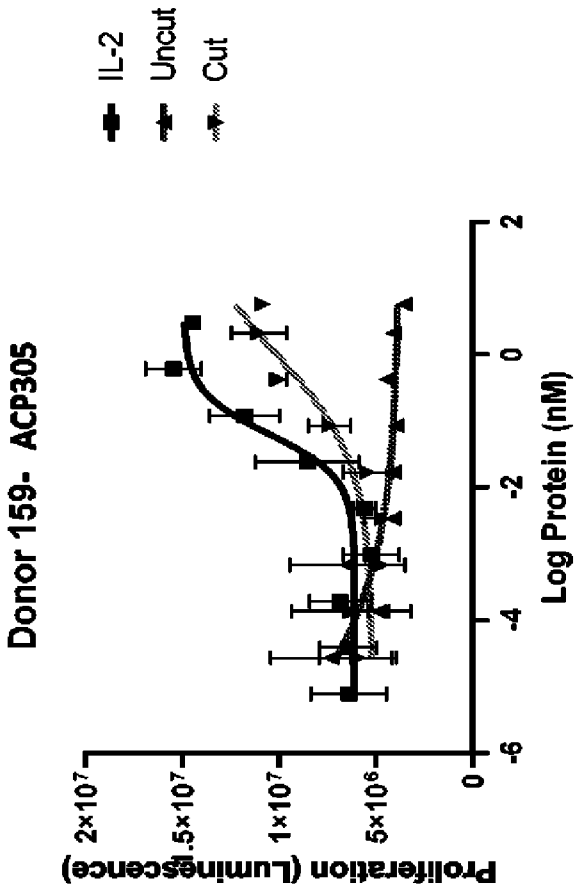

Donor 159- ACP305
IL-2
Uncut
Cut
Proliferation (Luminescence)
2×10^7
1.5×10^7
1×10^7
5×10^6
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54J

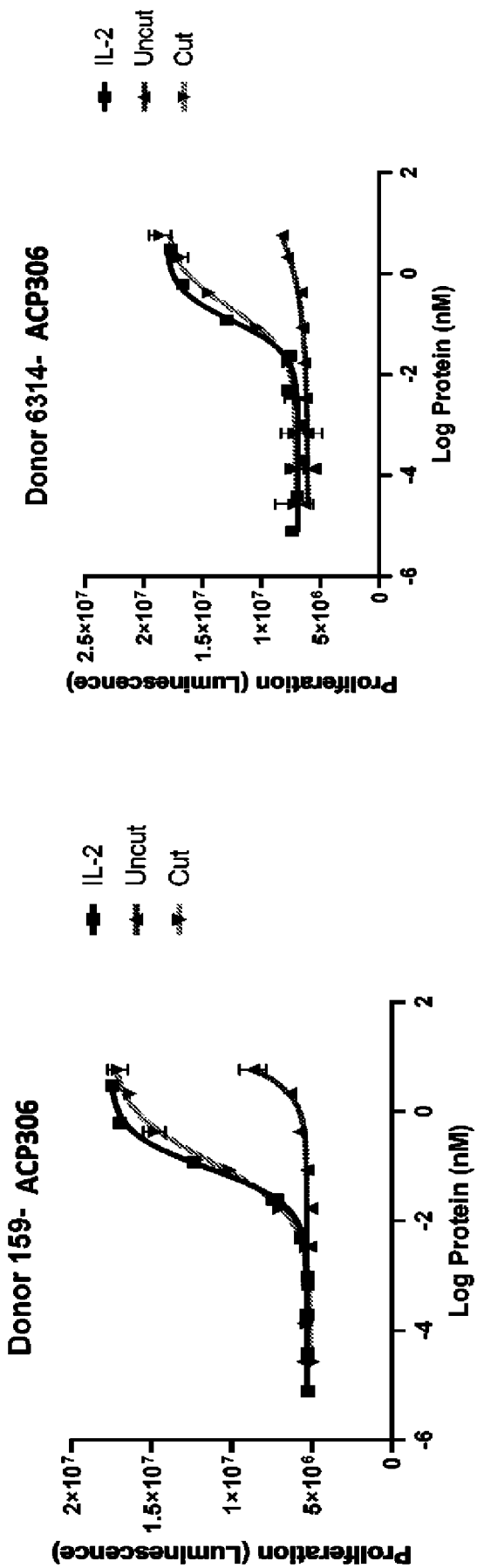

Donor 159- ACP306
Donor 6314- ACP306
IL-2
Uncut
Cut
Proliferation (Luminescence)
2×10^7
1.5×10^7
1×10^7
5×10^6
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54K

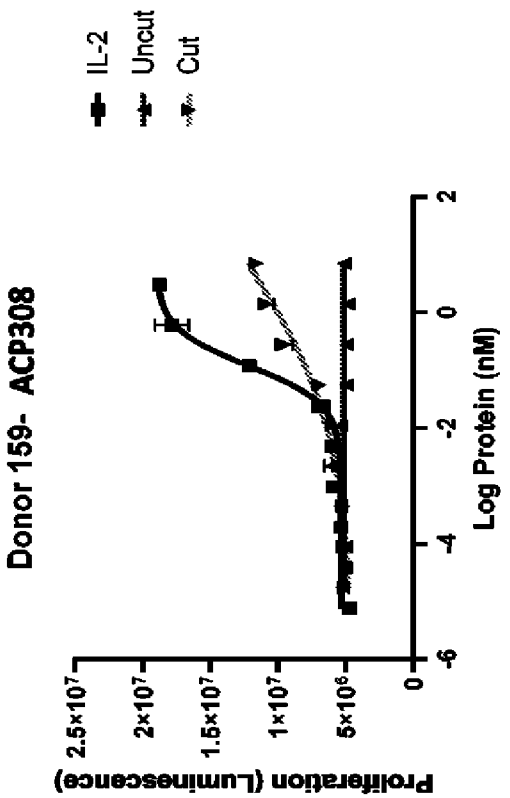

Donor 159- ACP308
IL-2
Uncut
Cut
Proliferation (Luminescence)
2.5×10^7
2×10^7
1.5×10^7
1×10^7
5×10^6
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54L

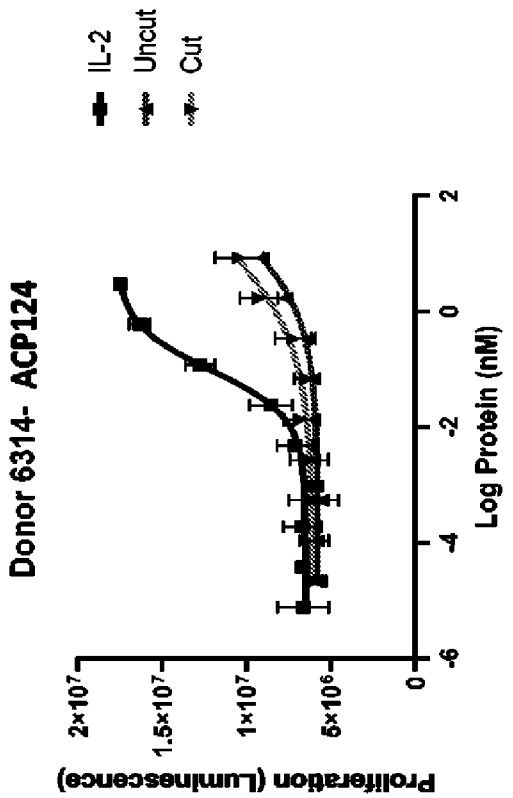

IL-2
Uncut
Cut
Donor 6314- ACP124
Proliferation (Luminescence)
2×10^7
1.5×10^7
1×10^7
5×10^6
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54M

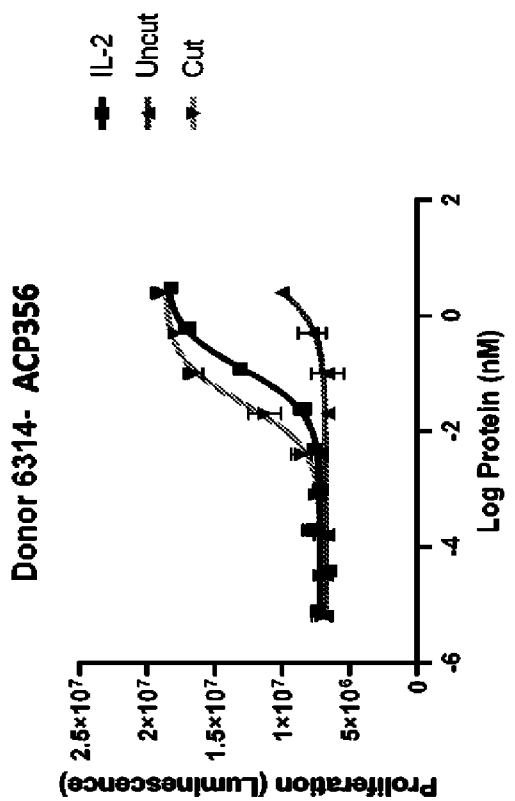

Donor 6314- ACP356
IL-2
Uncut
Cut
Proliferation (Luminescence)
2.5×10^7
2×10^7
1.5×10^7
1×10^7
5×10^6
0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 54N

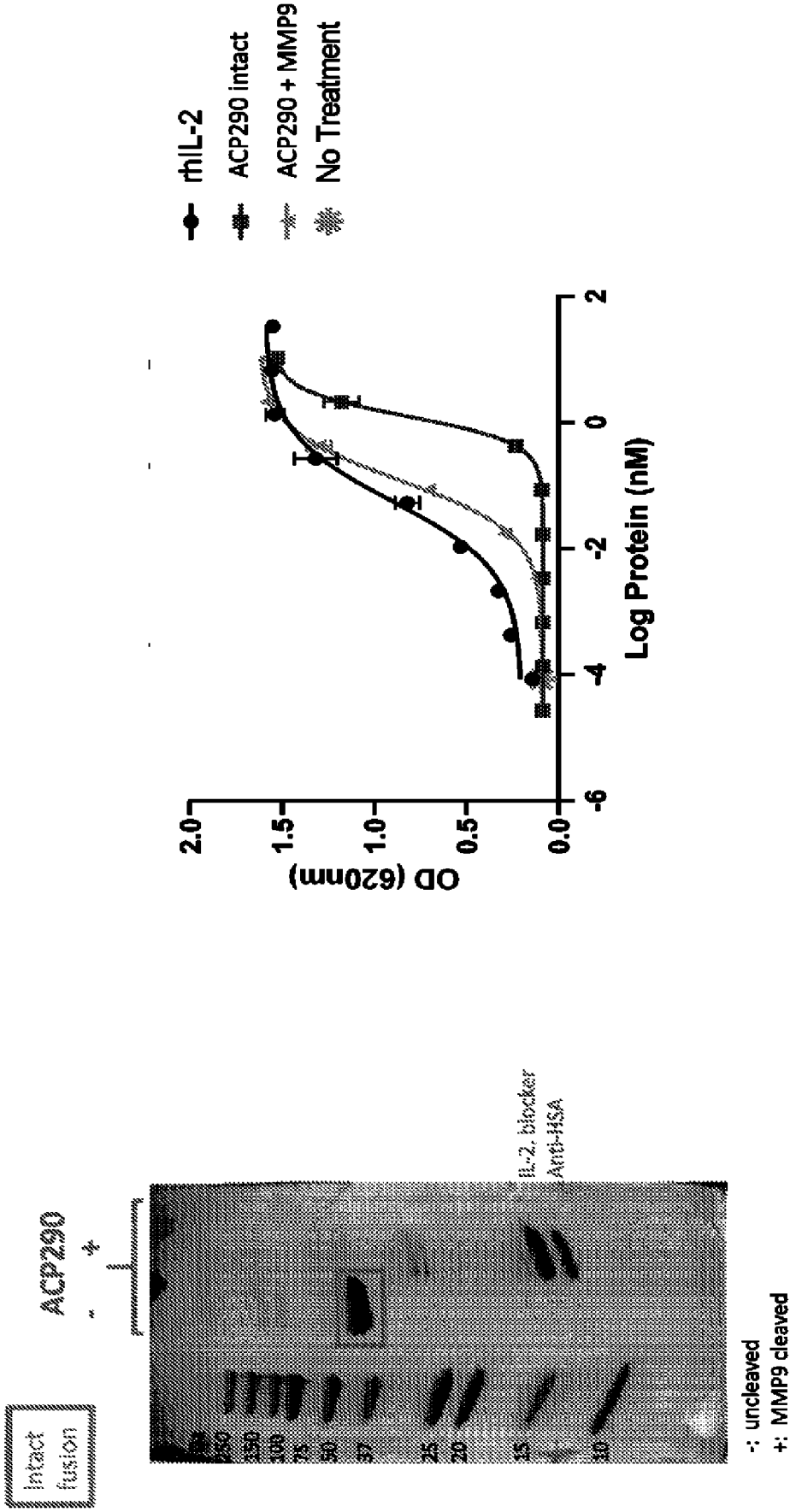

rhIL-2
ACP290 intact
ACP290 + MMP9
No Treatment
OD (620nm)
Log Protein (nM)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
ACP290
-
+
Intact fusion
IL-2 blocker
Anti-HSA
250
150
100
75
50
37
25
20
15
10
-: uncleaved
+: MMP9 cleaved

FIG. 55A

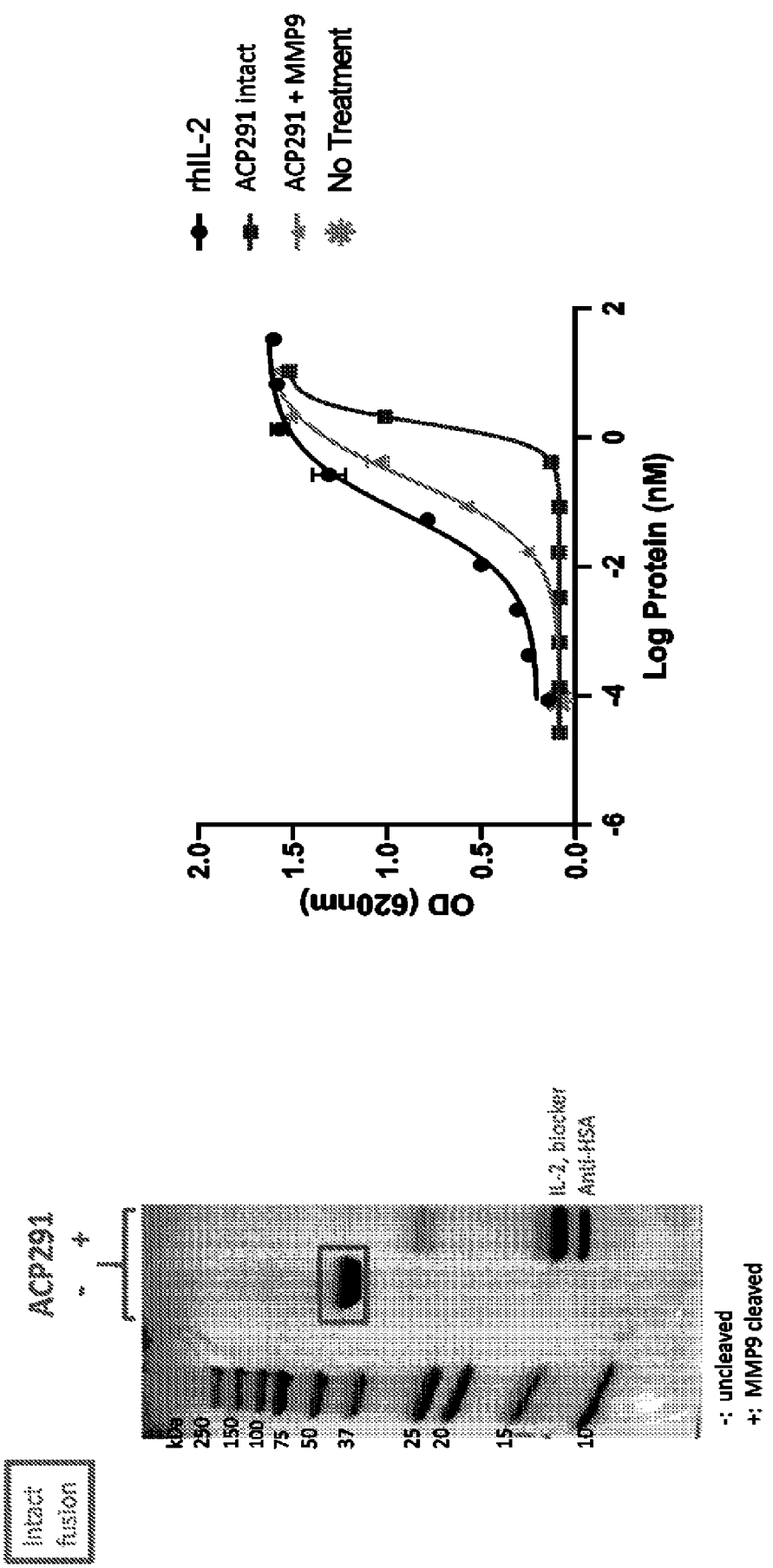

rhIL-2
ACP291 intact
ACP291 + MMP9
No Treatment
OD (620nm)
Log Protein (nM)
ACP291
Intact fusion
kDa
250
150
100
75
50
37
25
20
15
10
IL-2, blocker
Anti-HSA
-: uncleaved
+: MMP9 cleaved

FIG. 55B

rhIL-2
ACP292 Intact
ACP292 + MMP9
No Treatment
OD (620nm)
Log Protein (nM)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
ACP292
-
+
Intact fusion
kDa
250
150
100
75
50
37
25
20
15
10
IL-2, blocker
Anti-HSA
-: uncleaved
+: MMP9 cleaved

FIG. 55C

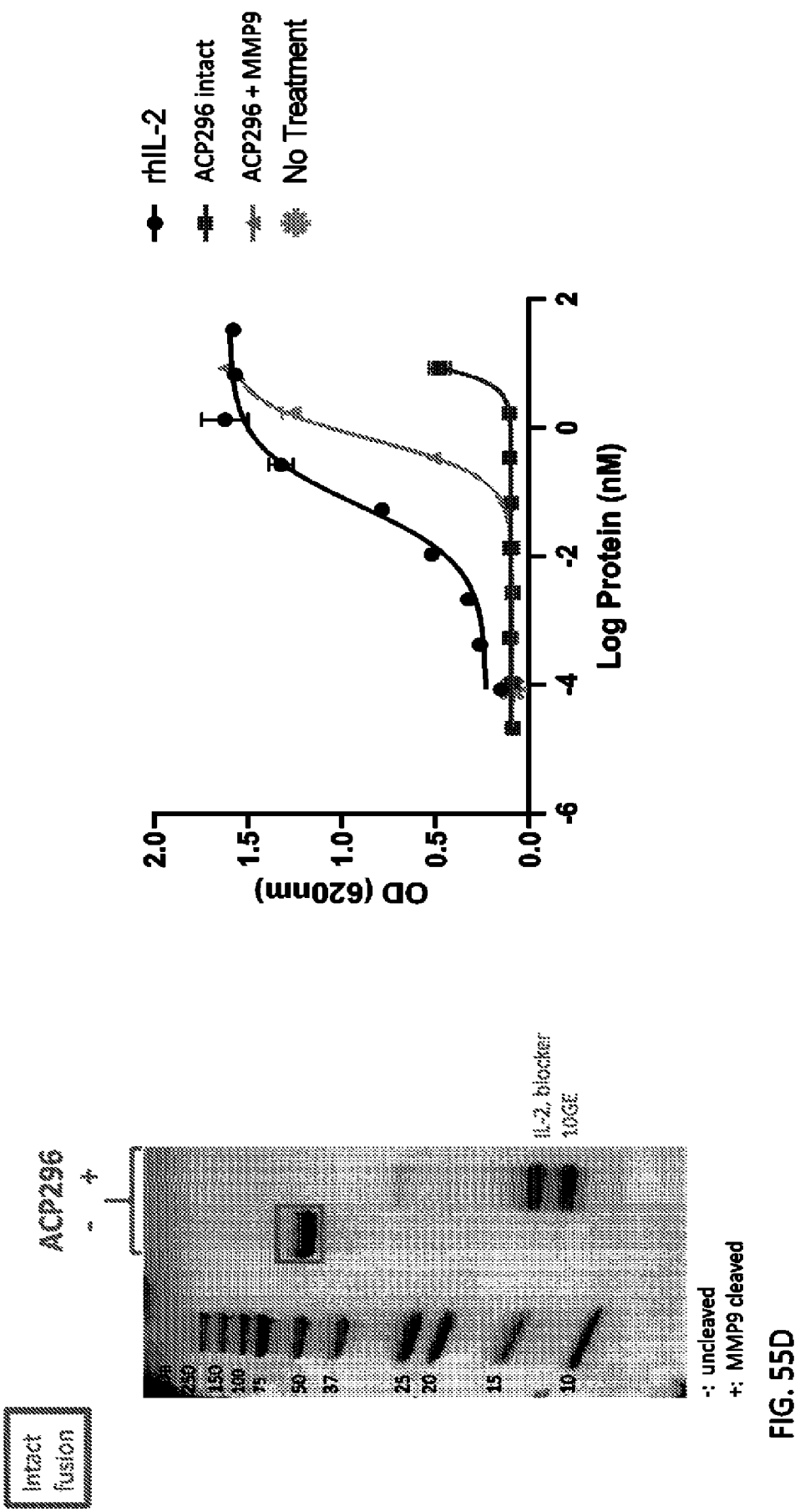
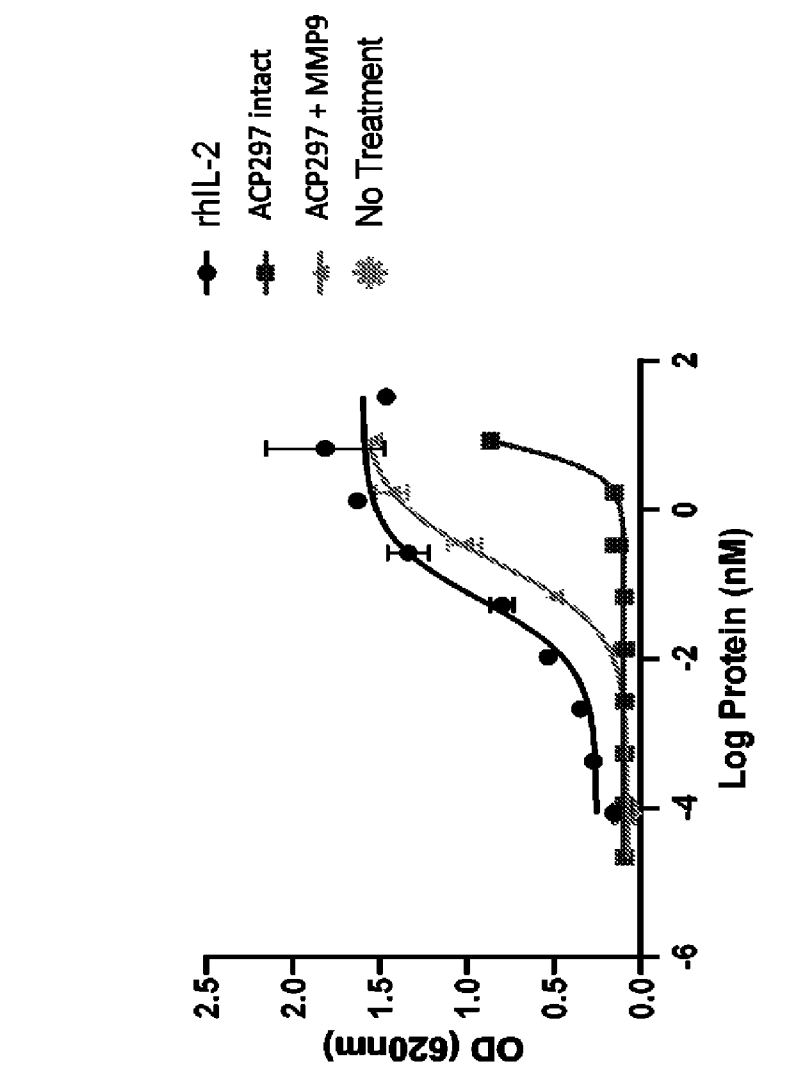

rhIL-2
ACP296 intact
ACP296 + MMP9
No Treatment
OD (620nm)
Log Protein (nM)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
ACP296
-
+
Intact fusion
250
150
100
75
50
37
25
20
15
10
IL-2 blocker
10GE
-: uncleaved
+: MMP9 cleaved

FIG. 55D


rhIL-2
ACP297 intact
ACP297 + MMP9
No Treatment
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

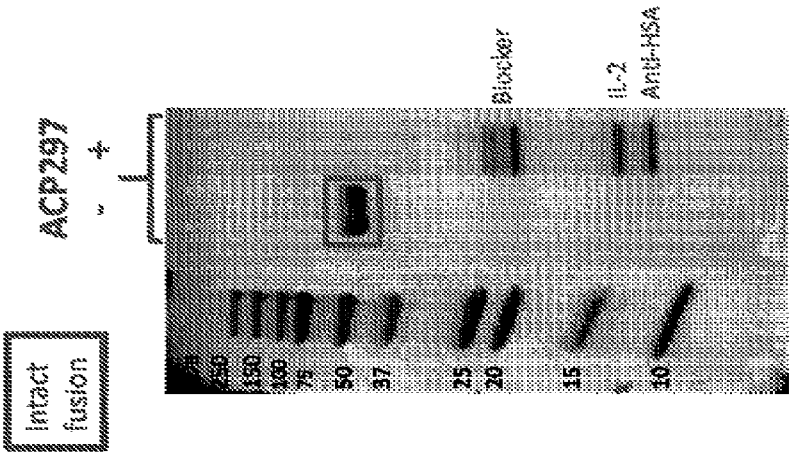
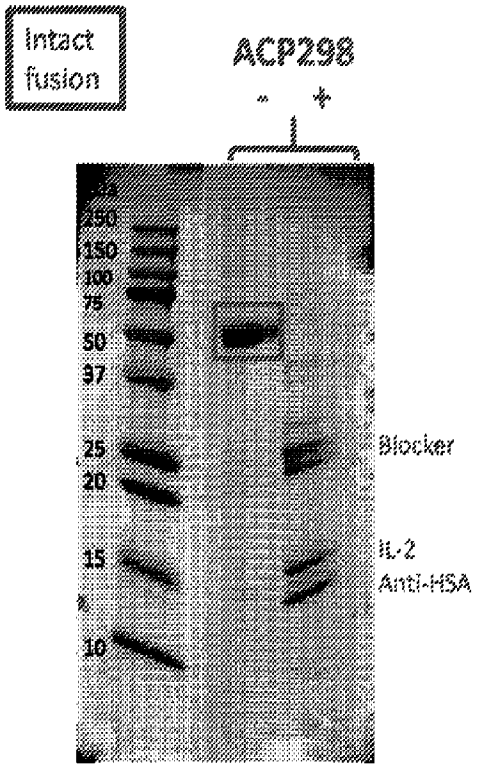
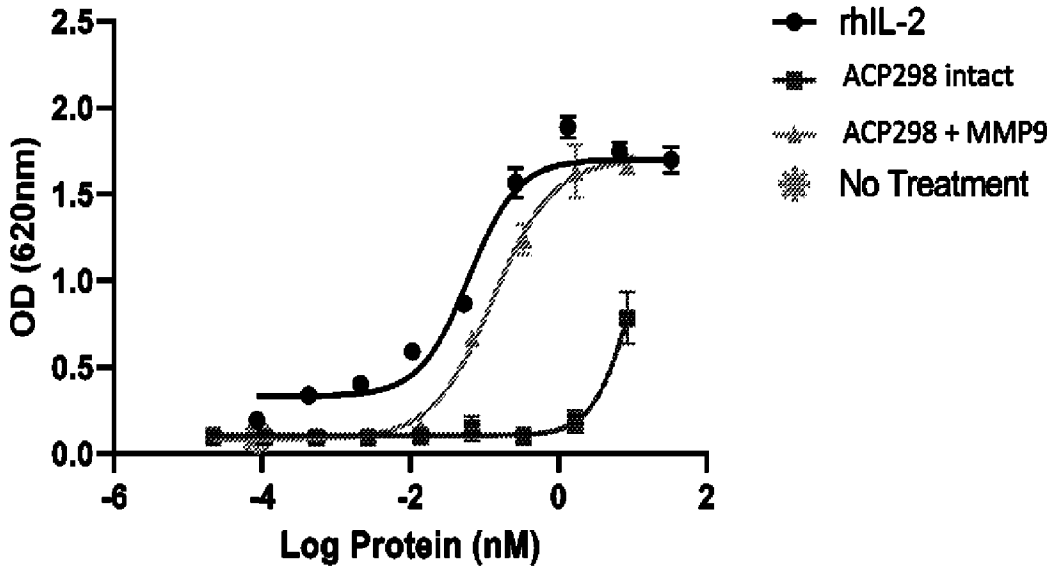

Intact fusion
ACP297
-
+
250
150
100
75
50
37
25
20
15
10
Biotin
IL-2
Anti-HSA
-: uncleaved
+: MMP9 cleaved

FIG. 55E



-: uncleaved
+: MMP9 cleaved

FIG. 55F



rhIL-2
ACP300 intact
ACP300 + MMP9
No Treatment
OD (620nm)
Log Protein (nM)
ACP300
Intact fusion
Albumin
Blocker
IL-2
-: uncleaved
+: MMP9 cleaved

FIG. 55G

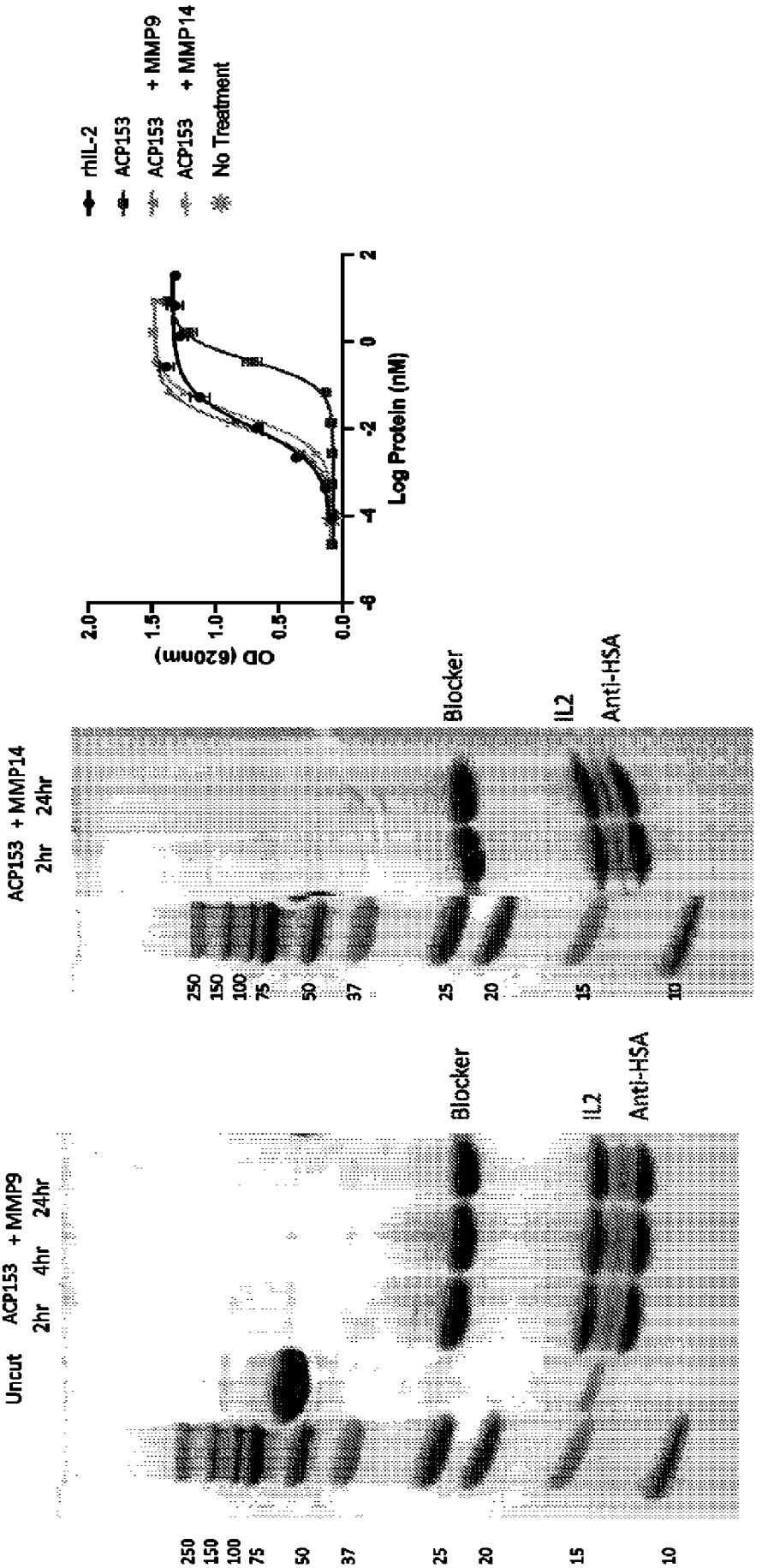

rhIL-2
ACP153
ACP153 + MMP9
ACP153 + MMP14
No Treatment
OD (620nm)
Log Protein (nM)
ACP153 + MMP14
2hr 24hr
Blocker
IL2
Anti-HSA
Uncut
ACP153 + MMP9
2hr 4hr 24hr
250
150
100
75
50
37
25
20
15
10

FIG. 55H

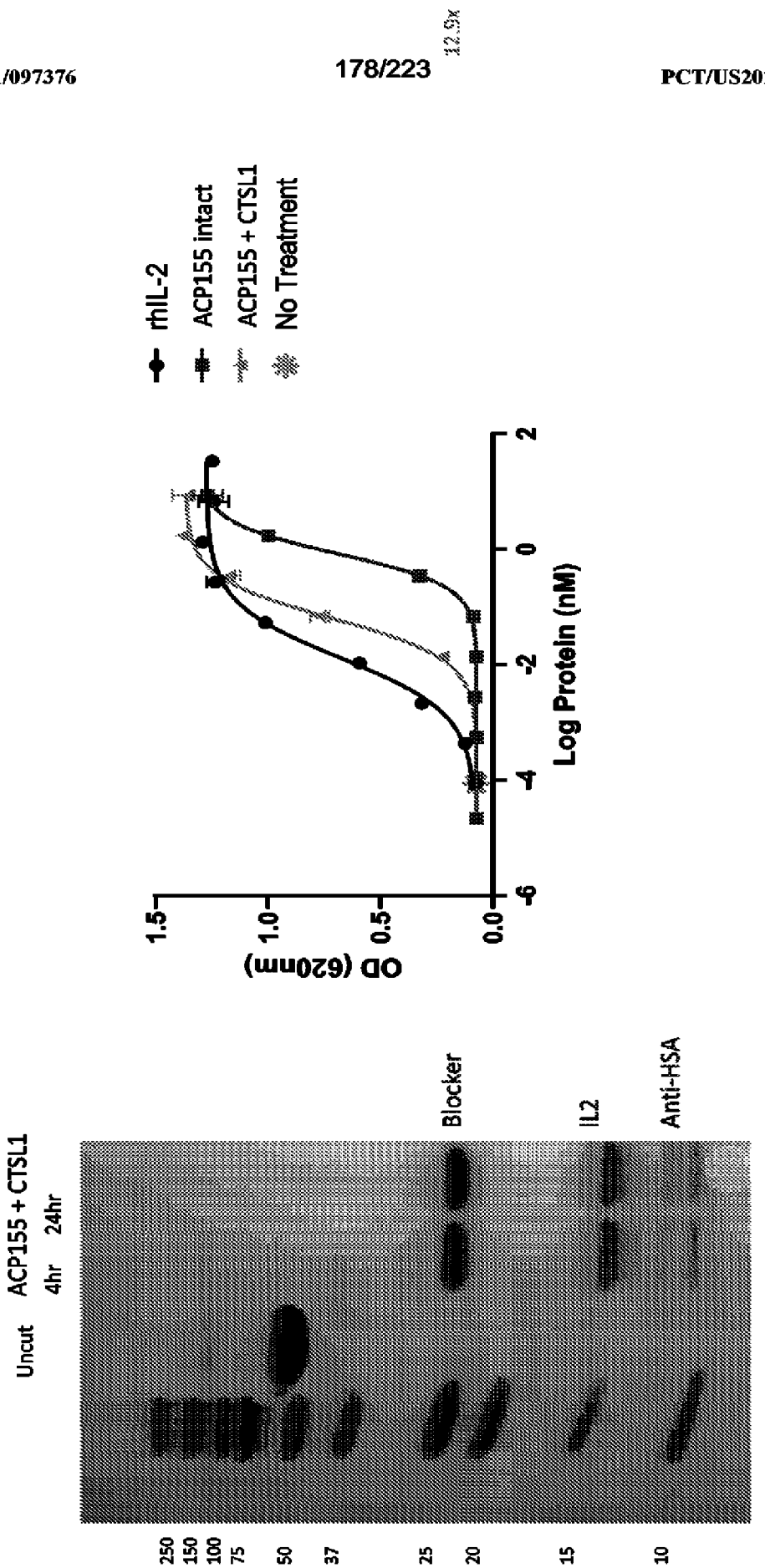

rhIL-2
ACP155 intact
ACP155 + CTSL1
No Treatment
OD (620nm)
Log Protein (nM)
Uncut
ACP155 + CTSL1
4hr
24hr
Blocker
IL2
Anti-HSA
250
150
100
75
50
37
25
20
15
10

FIG. 55I

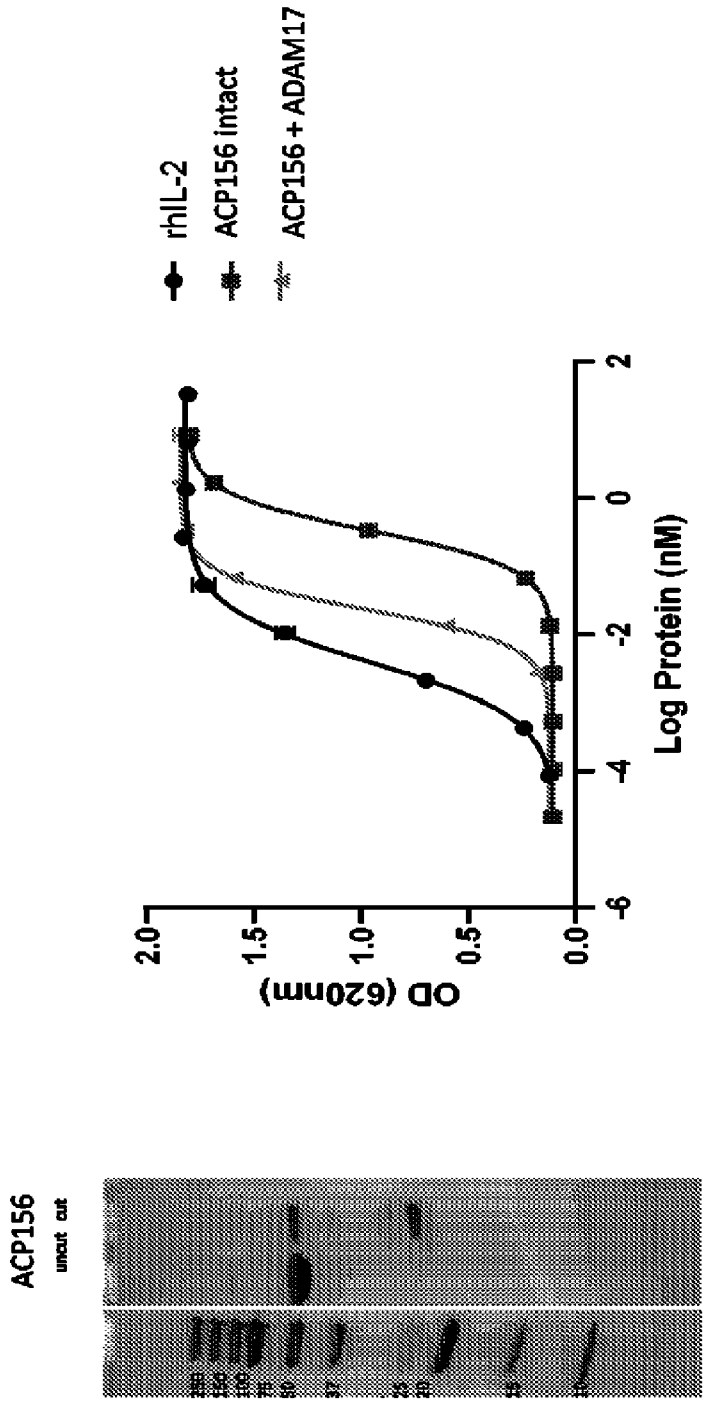

rhIL-2
ACP156 intact
ACP156 + ADAM17
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)
ACP156
uncut cut

FIG. 55J

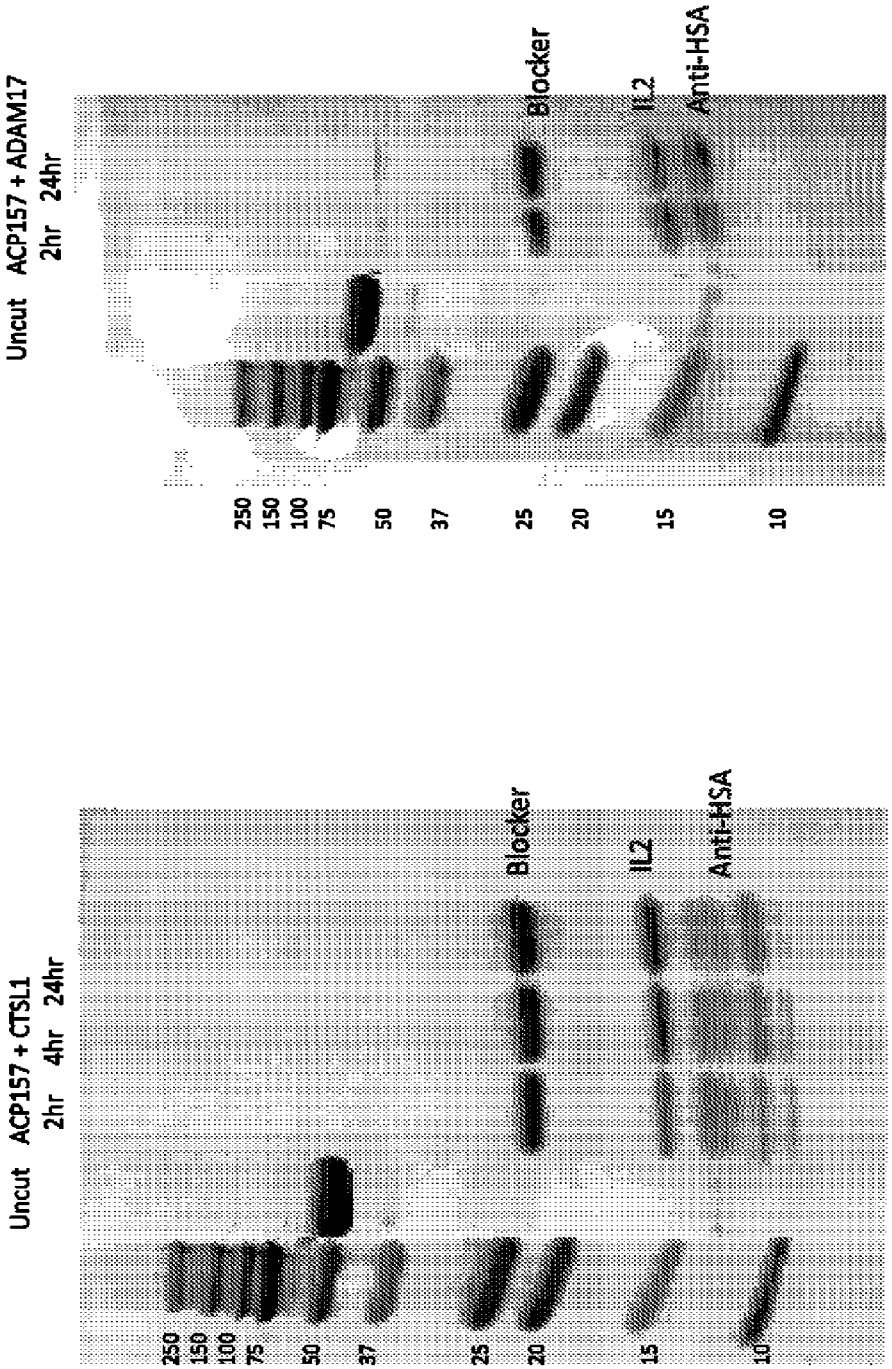

Uncut ACP157 + ADAM17
2hr 24hr
Blocker
IL2
Anti-HSA
250
150
100
75
50
37
25
20
15
10
Uncut ACP157 + CTSL1
2hr 4hr 24hr
Blocker
IL2
Anti-HSA
250
150
100
75
50
37
25
20
15
10

FIG. 55K

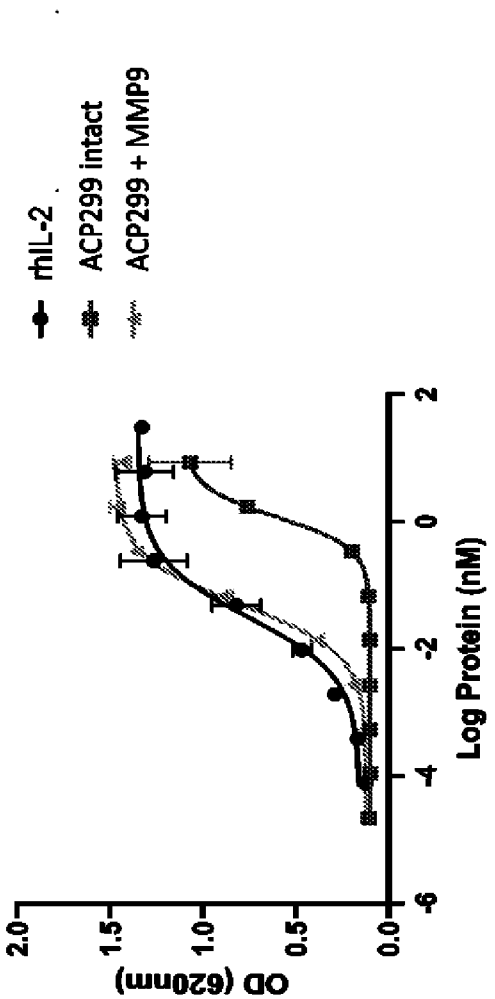
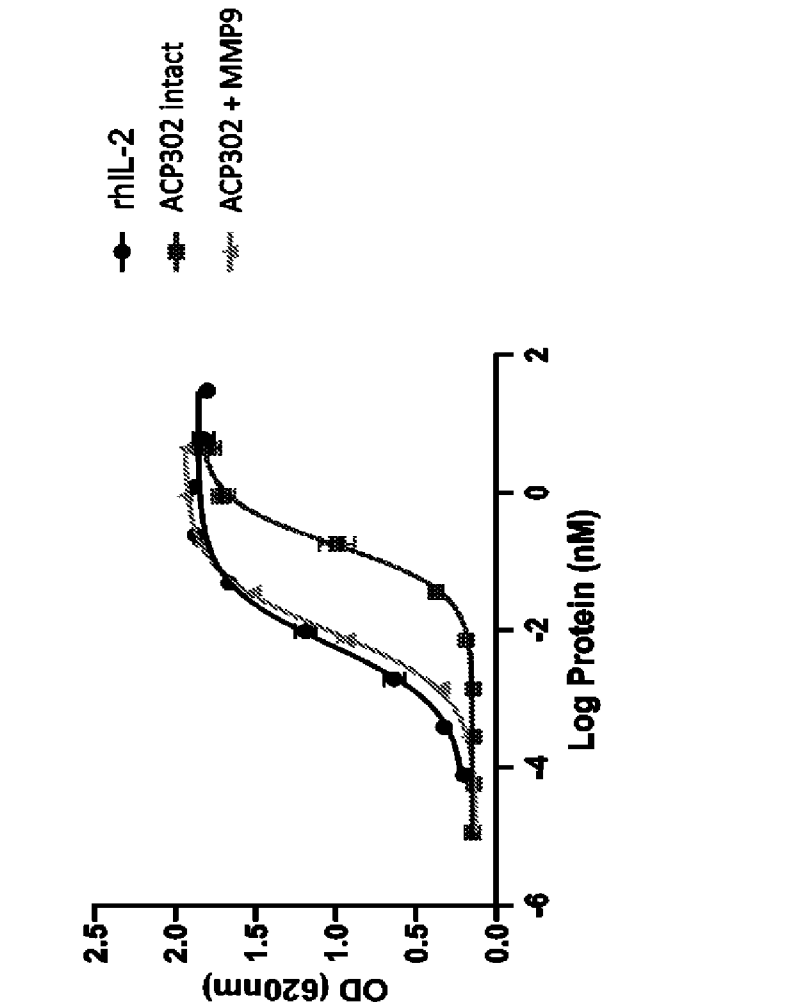

rhIL-2
ACP299 intact
ACP299 + MMP9
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 55L


rhIL-2
ACP302 Intact
ACP302 + MMP9
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

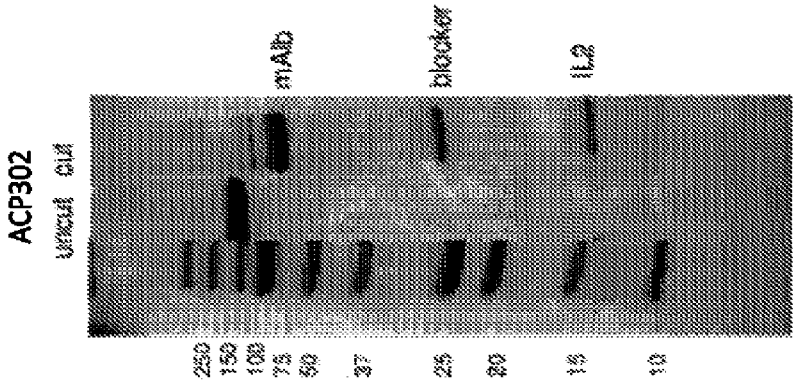
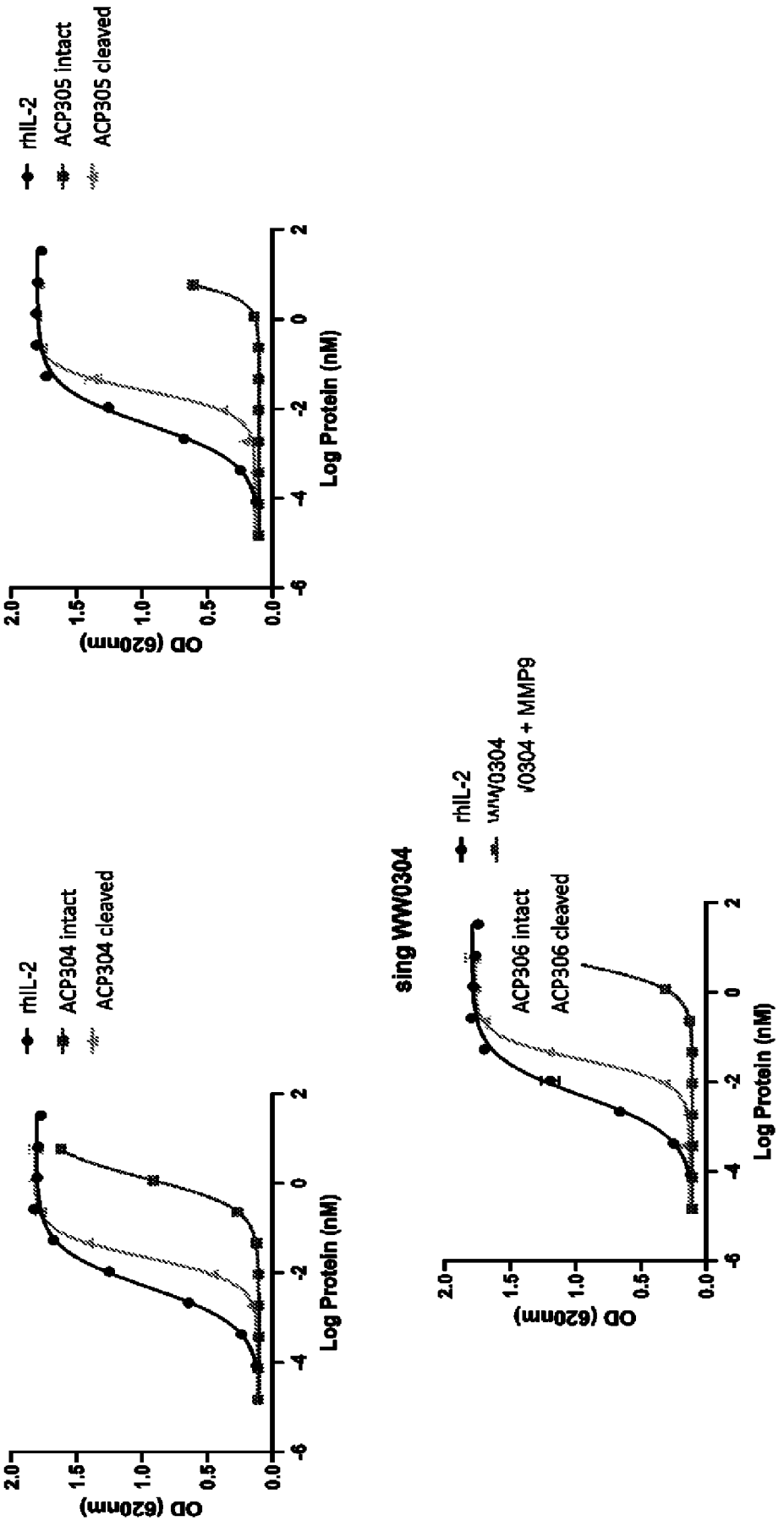

ACP302
uncut
cut
mAb
blocker
IL2
250
150
100
75
50
37
25
20
15
10

FIG. 55M

FIG. 55N


rhIL-2
ACP305 intact
ACP305 cleaved
OD (620nm)
Log Protein (nM)
rhIL-2
ACP304 intact
ACP304 cleaved
OD (620nm)
Log Protein (nM)
sing WW0304
rhIL-2
WW0304
/0304 + MMP9
ACP306 intact
ACP306 cleaved
OD (620nm)
Log Protein (nM)

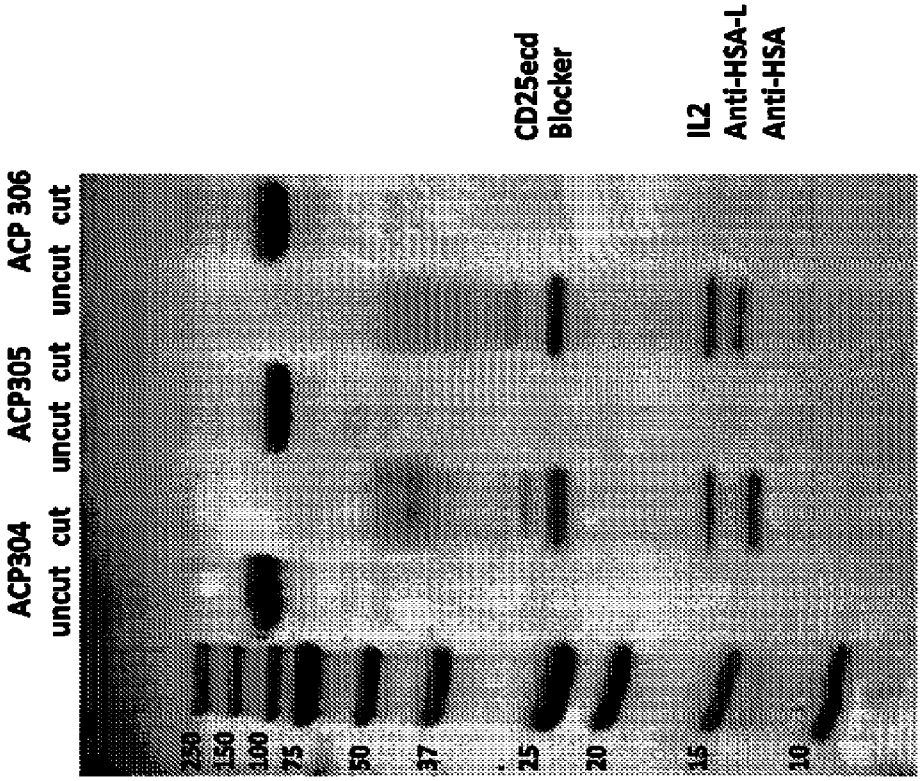

ACP304
uncut cut
ACP305
uncut cut
ACP 306
uncut cut
CD25ecd
Blocker
IL2
Anti-HSA-L
Anti-HSA
250
150
100
75
50
37
25
20
15
10

FIG. 56

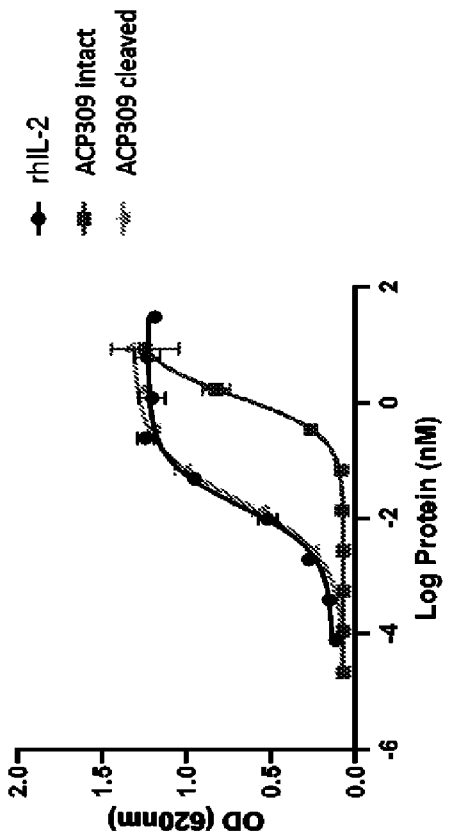

rhIL-2
ACP309 intact
ACP309 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 57A

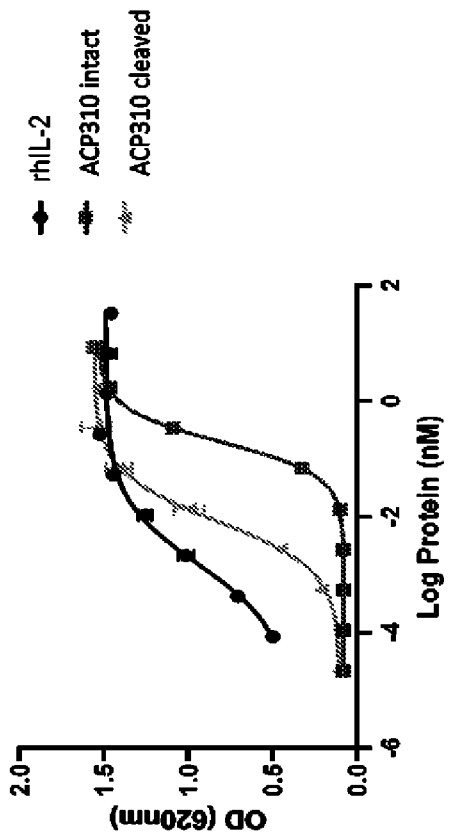

rhIL-2
ACP310 intact
ACP310 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 57B

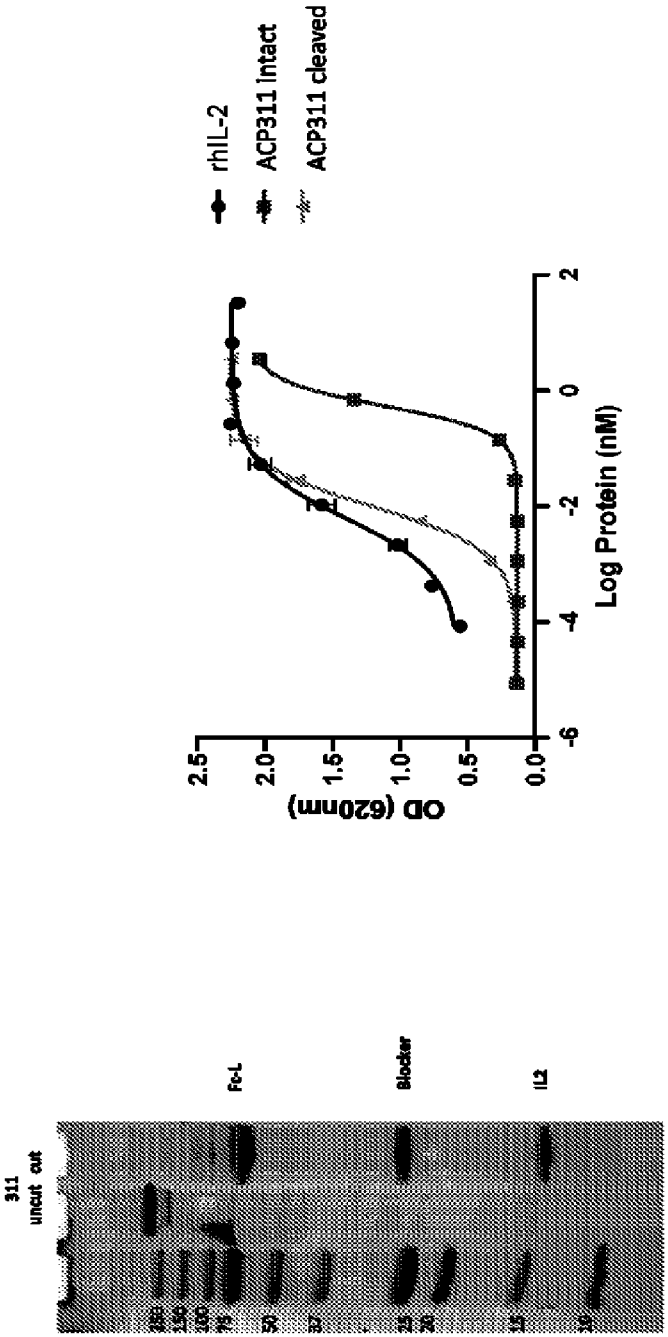

rhIL-2
ACP311 intact
ACP311 cleaved
OD (620nm)
Log Protein (nM)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
311
uncut cut
Fc-L
Blocker
IL2

FIG. 57C

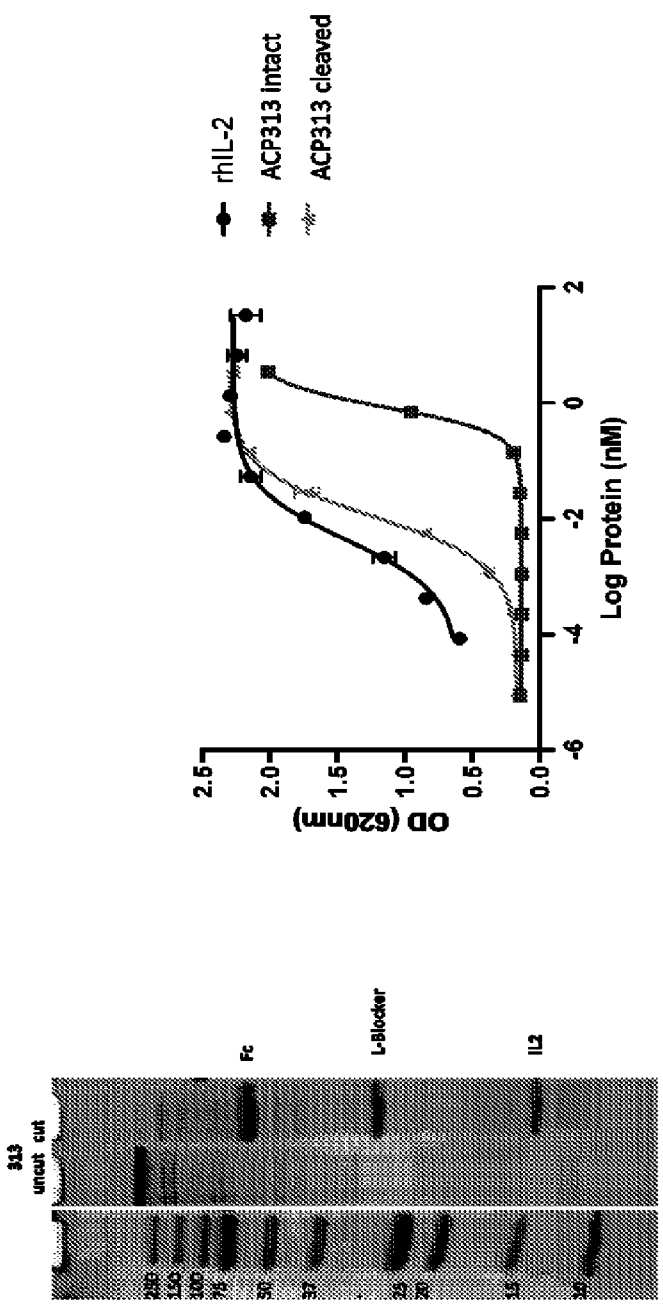

rhIL-2
ACP313 intact
ACP313 cleaved
OD (620nm)
Log Protein (nM)
313
uncut cut
Fc
L-Blocker
IL2

FIG. 57D

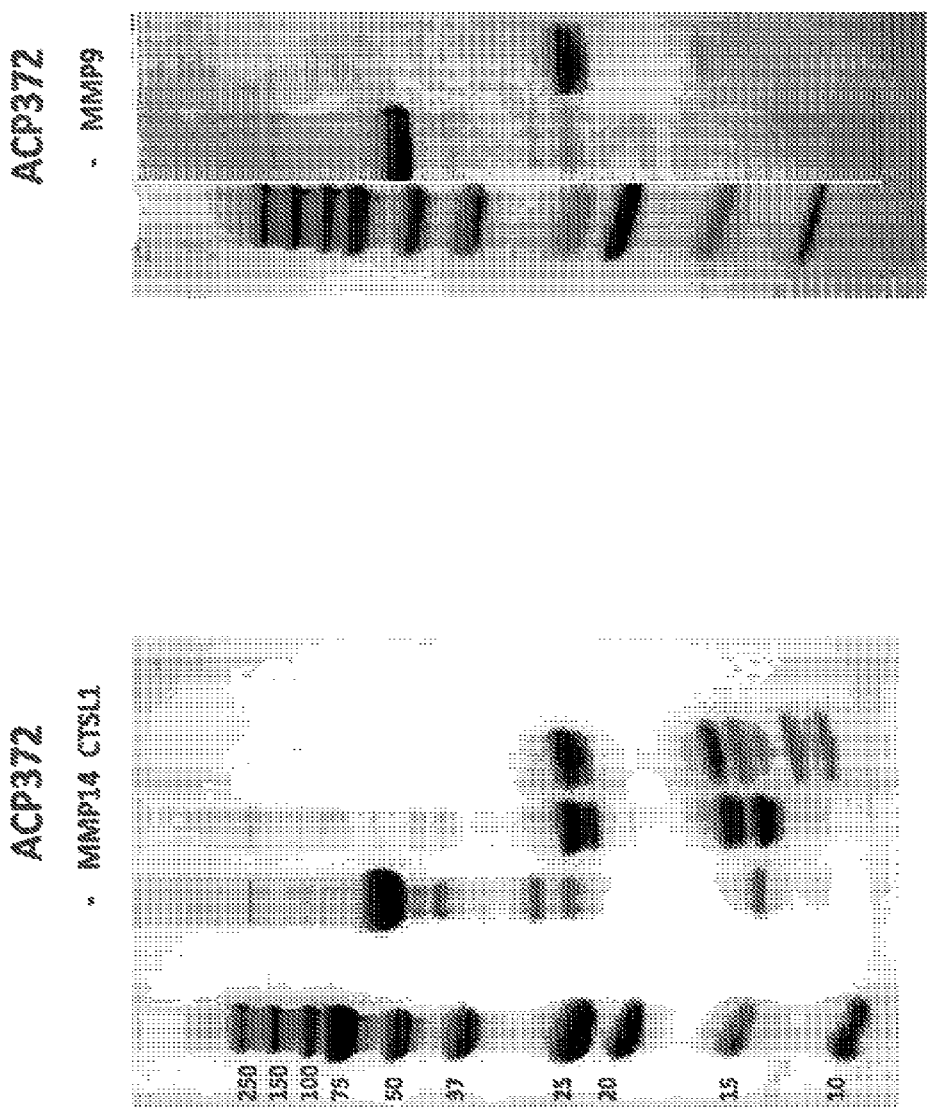


FIG. 58

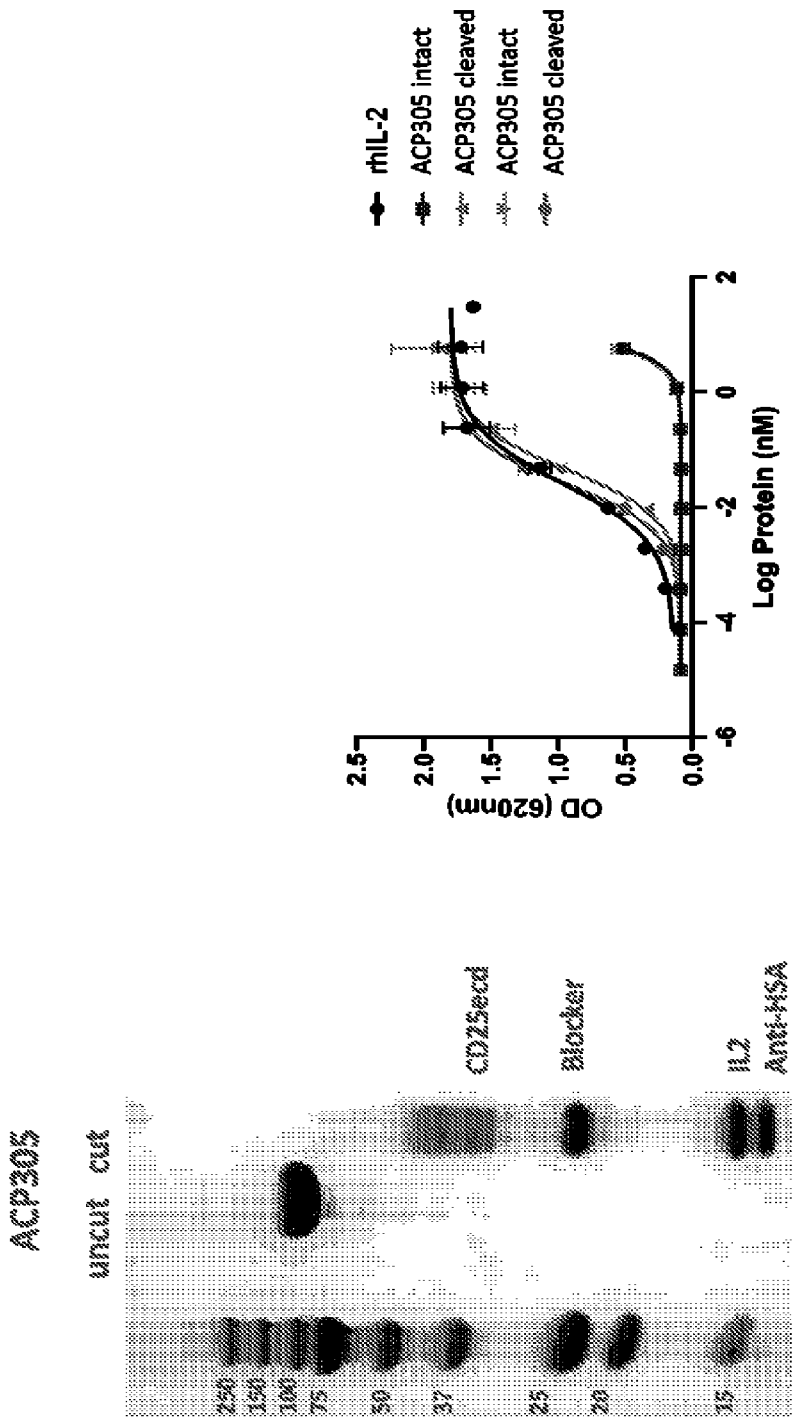
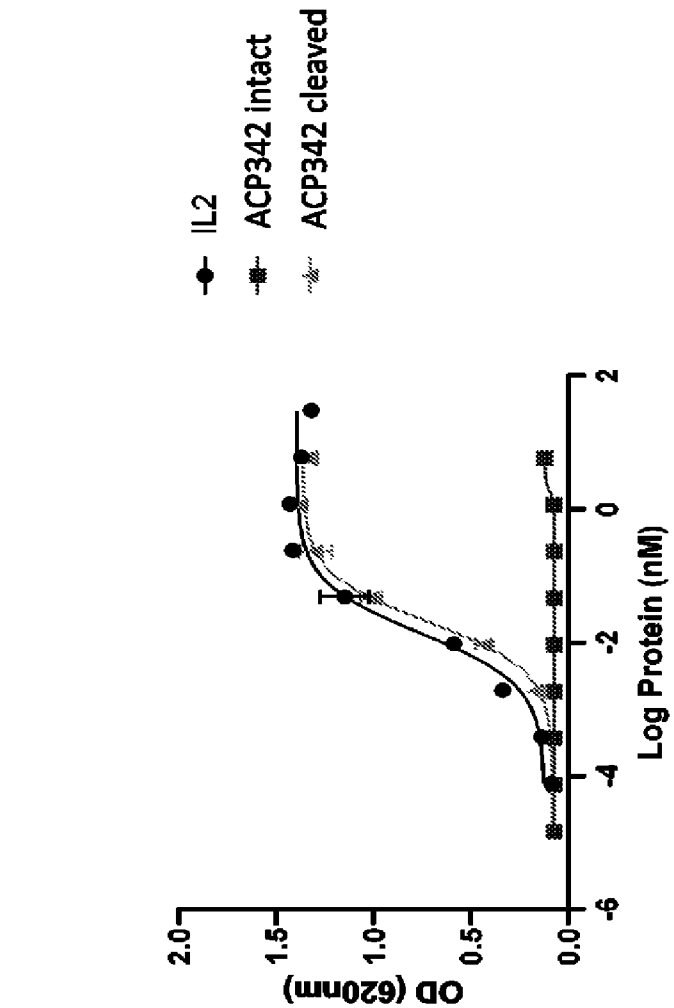

ACP305
uncut cut
250
150
100
75
50
37
25
20
15
10
CD2Secd
Blocker
IL2
Anti-HSA
rhIL-2
ACP305 intact
ACP305 cleaved
ACP305 intact
ACP305 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

FIG. 59A


IL2
ACP342 intact
ACP342 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

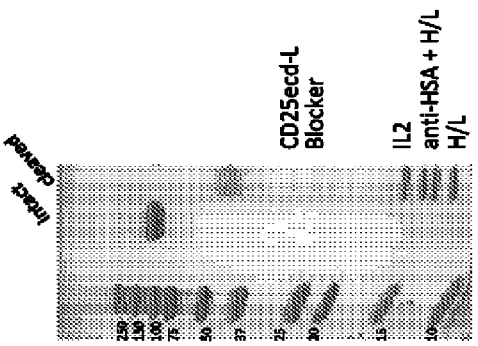
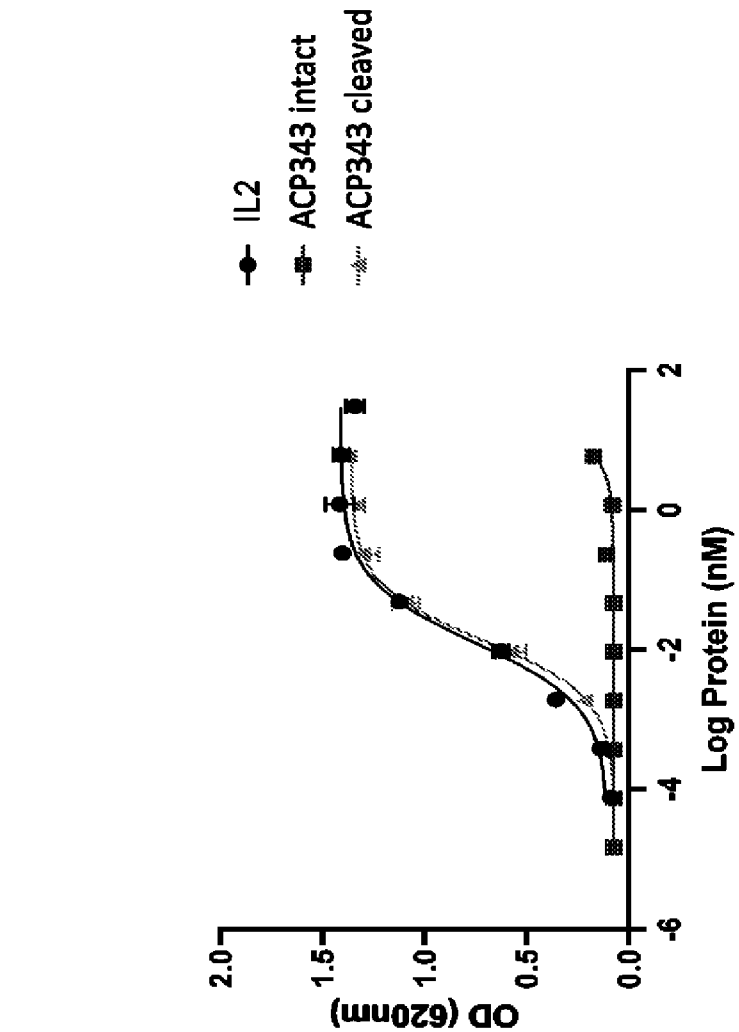

Intact
Cleaved
CD25ecd-L Blocker
IL2 anti-HSA + H/L
H/L

FIG. 59B


IL2
ACP343 intact
ACP343 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

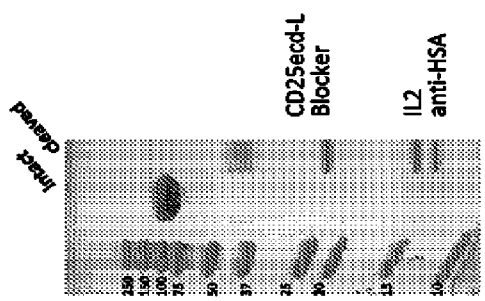

Intact
Cleaved
CD25ecd-L Blocker
IL2 anti-HSA

FIG. 59C

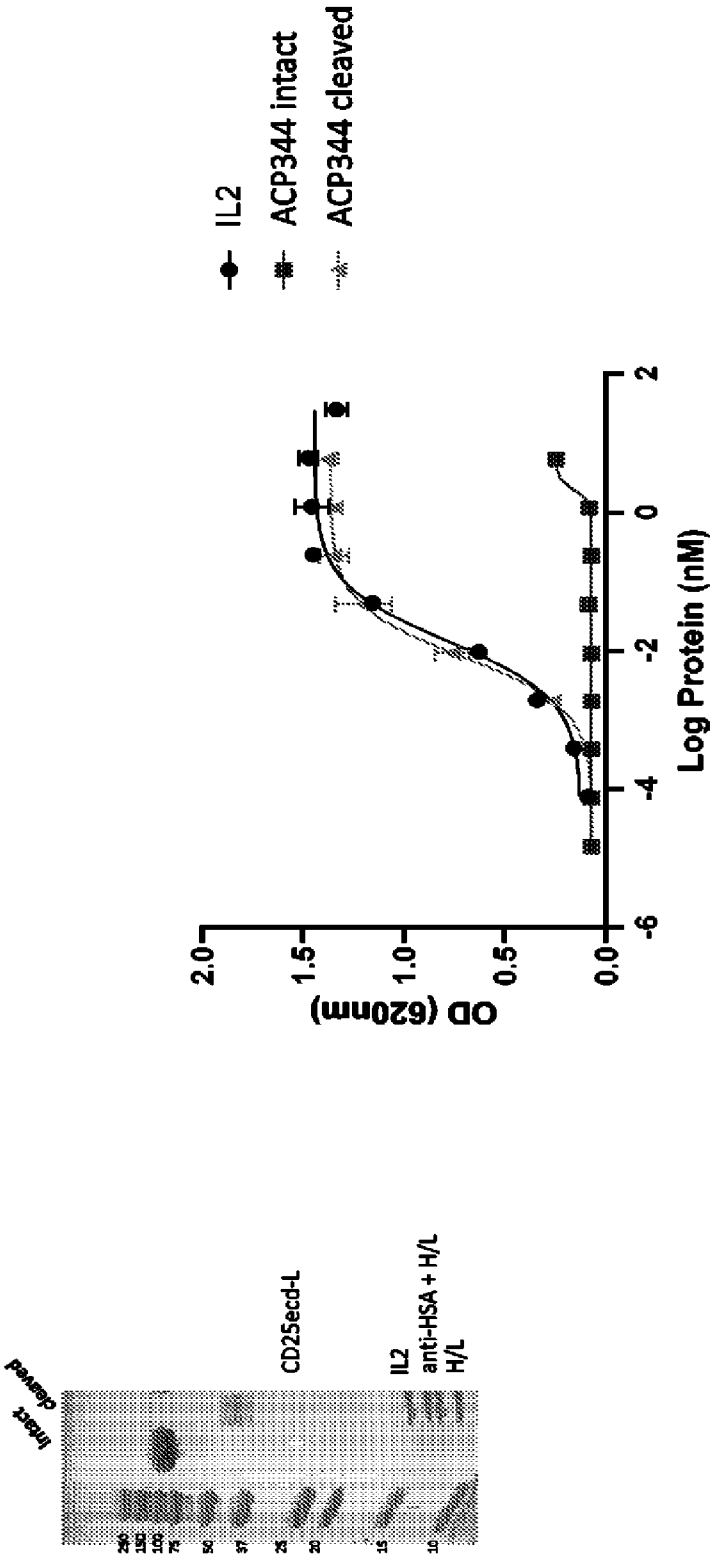
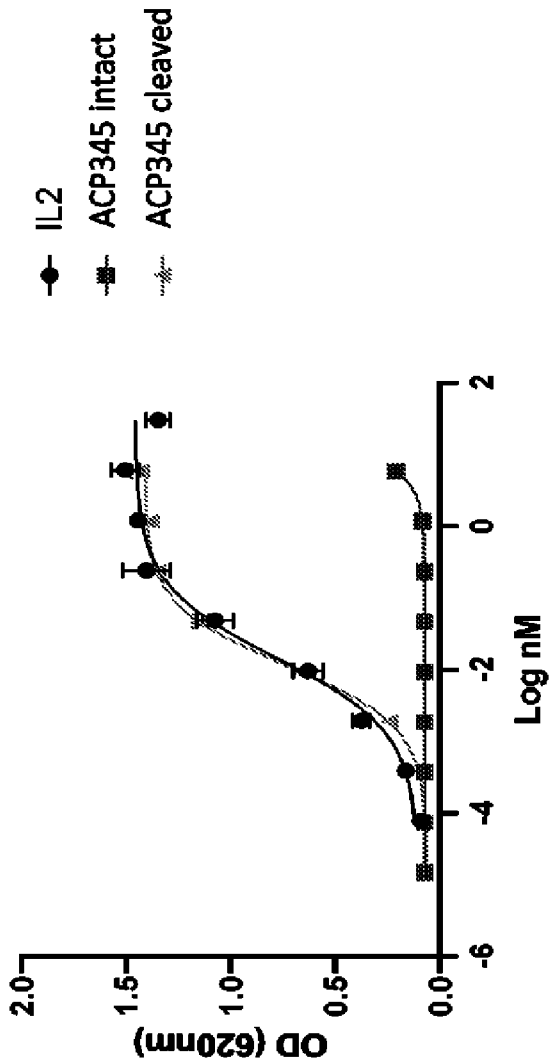

IL2
ACP344 intact
ACP344 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)
intact
cleaved
CD25ecd-L
IL2
anti-HSA + H/L
H/L

FIG. 59D


IL2
ACP345 intact
ACP345 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log nM

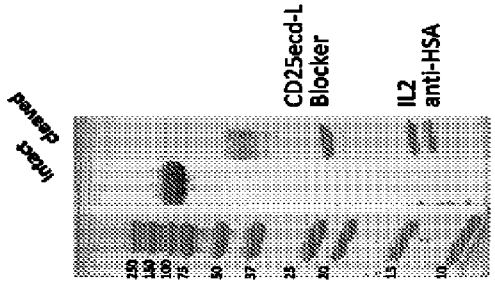
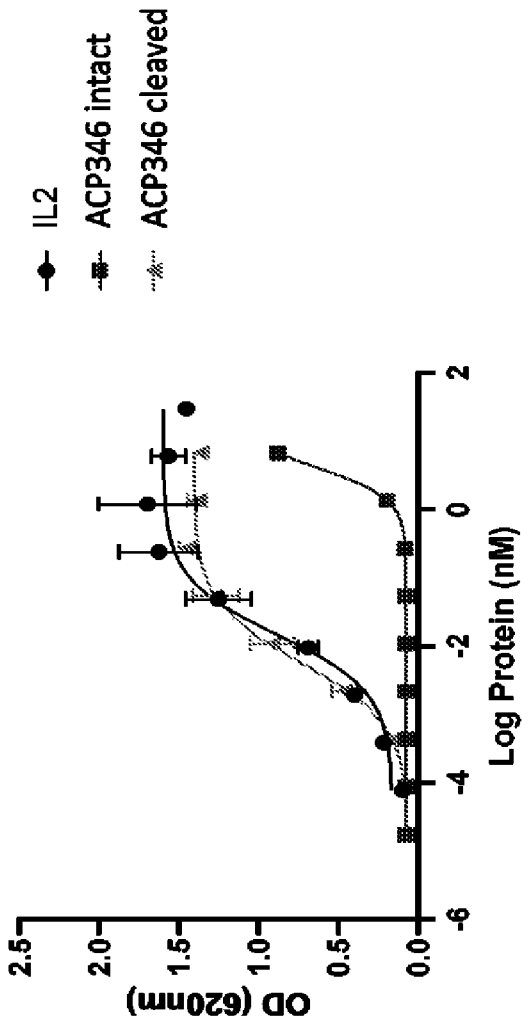

intact
cleaved
CD25ecd-L Blocker
IL2 anti-HSA

FIG. 59E


IL2
ACP346 intact
ACP346 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

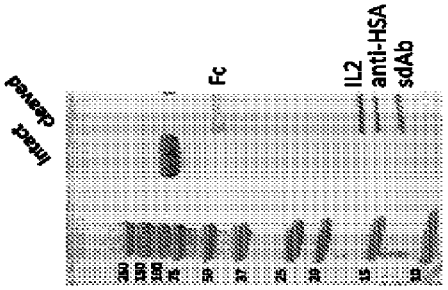
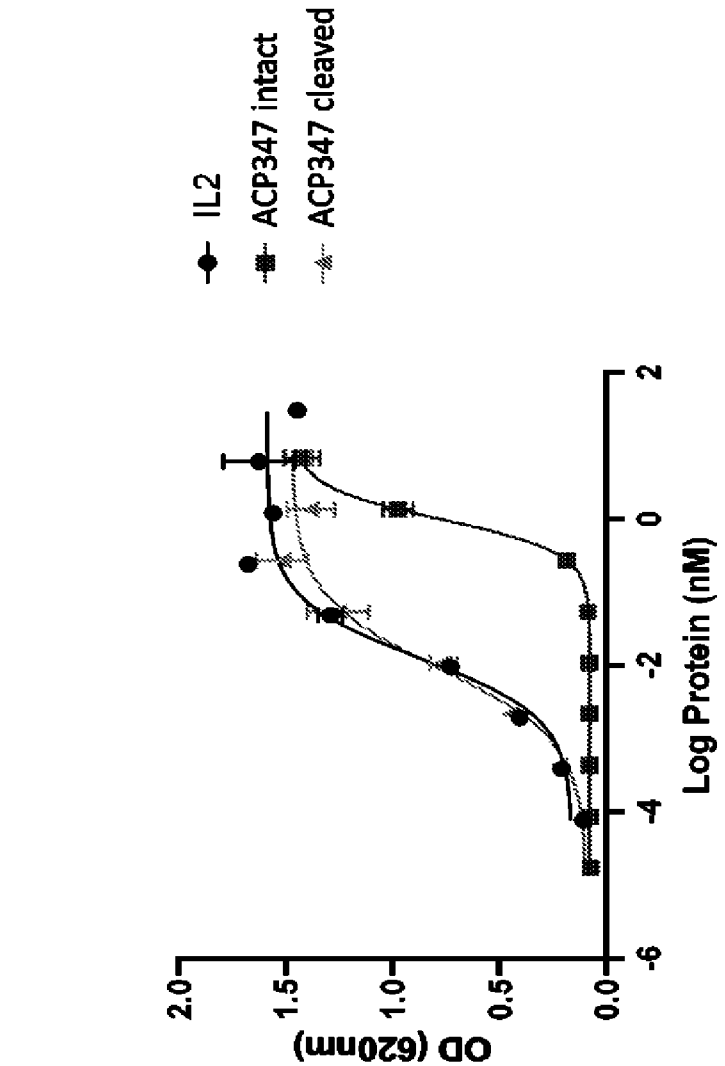

Intact
Cleaved
Fc
IL2
anti-HSA
sdAb

FIG. 59F


IL2
ACP347 intact
ACP347 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

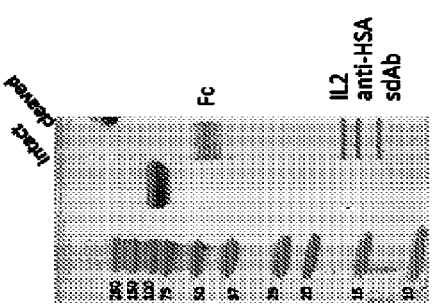
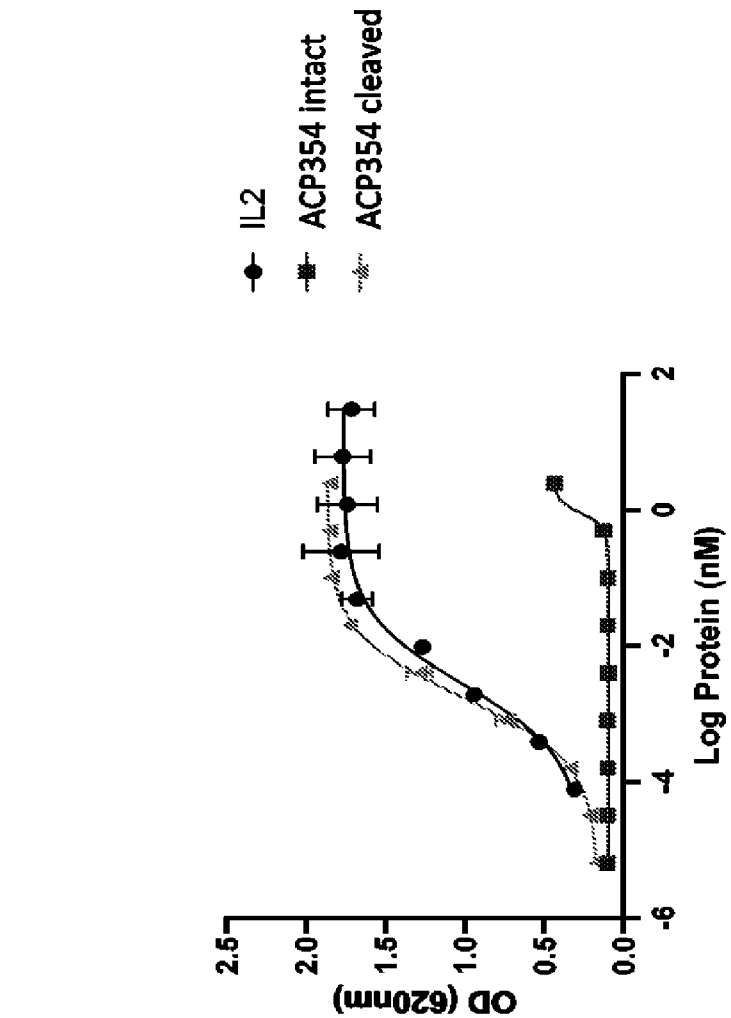

Intact
Cleaved
Fc
IL2
anti-HSA
sdAb

FIG. 59G


IL2
ACP354 intact
ACP354 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

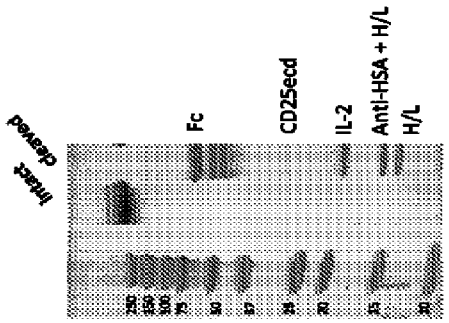
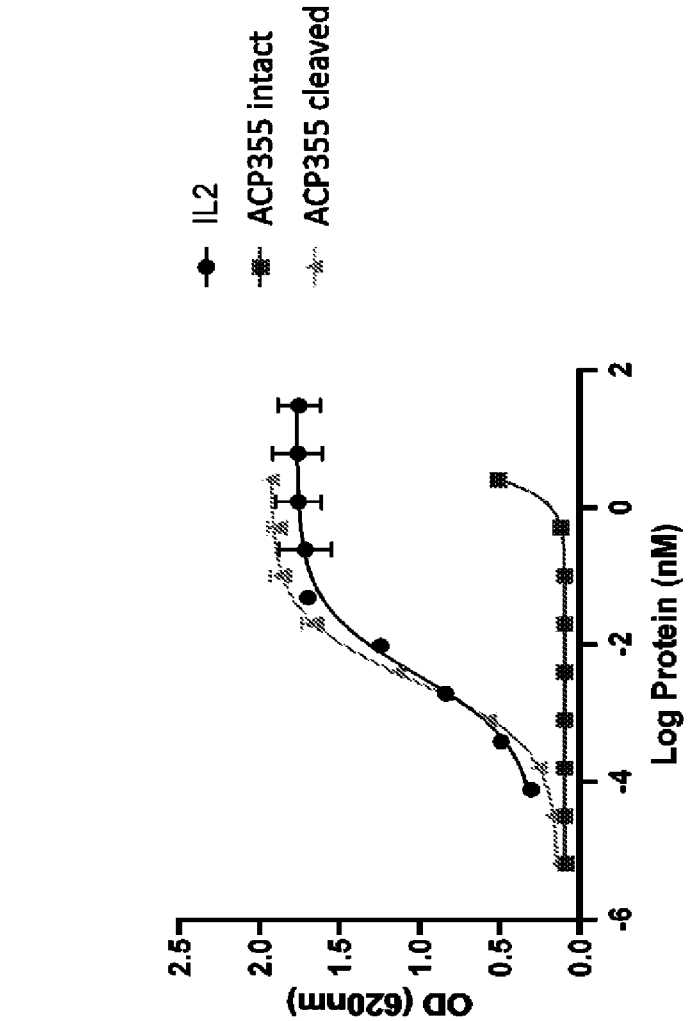

Intact
Cleaved
Fc
CD25ecd
IL-2
Anti-HSA + H/L
H/L

FIG. 59H


IL2
ACP355 intact
ACP355 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

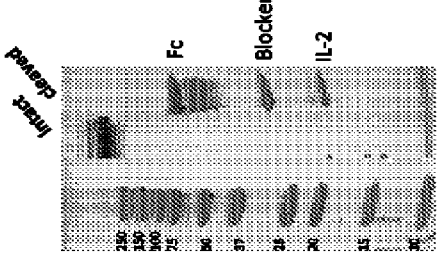
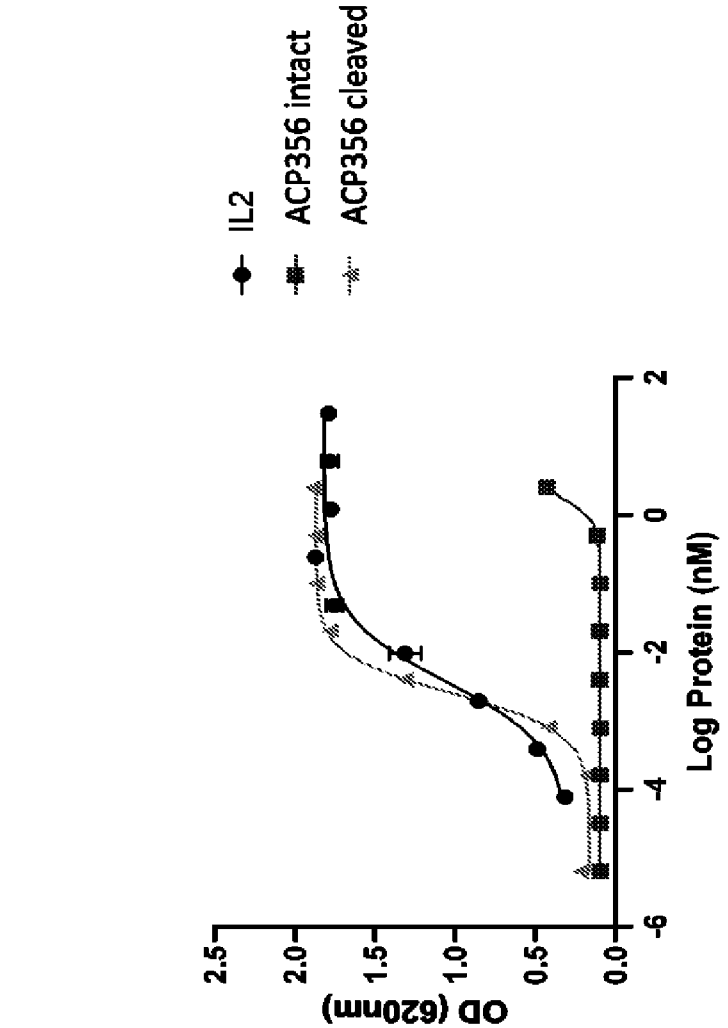

Intact
Cleaved
Fc
Blocker
IL-2

FIG. 59I


IL2
ACP356 intact
ACP356 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

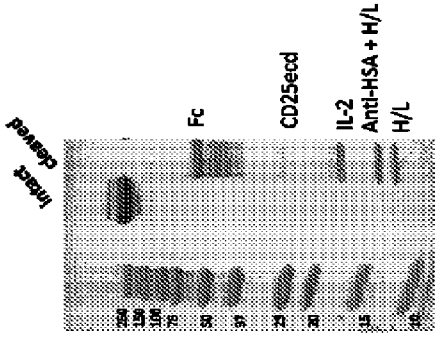
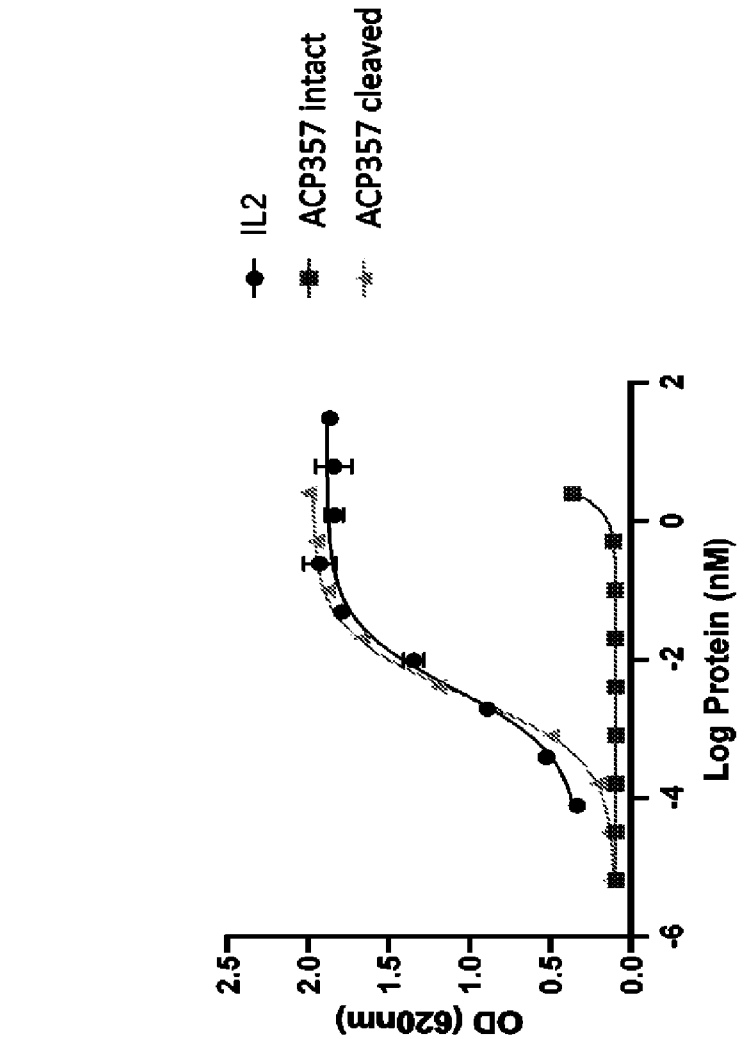

Intact
Cleaved
Fc
CD25ecd
IL-2
Anti-HSA + H/L
H/L

FIG.59J


IL2
ACP357 intact
ACP357 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

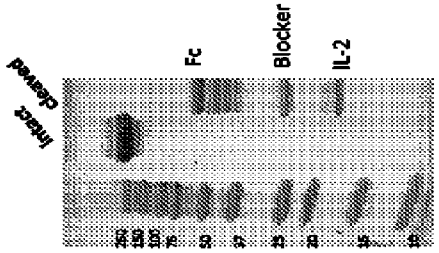
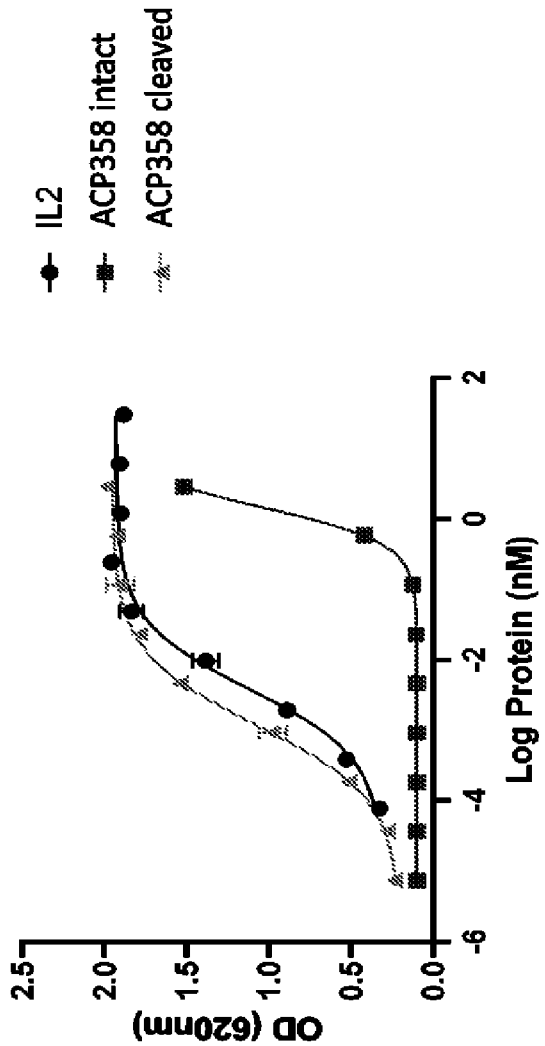

Intact
Cleaved
Fc
Blocker
IL-2

FIG. 59K


IL2
ACP358 intact
ACP358 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

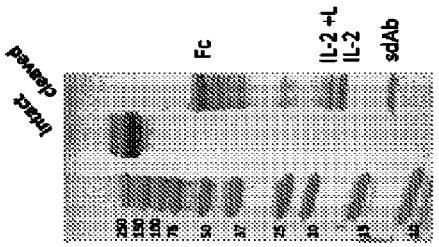
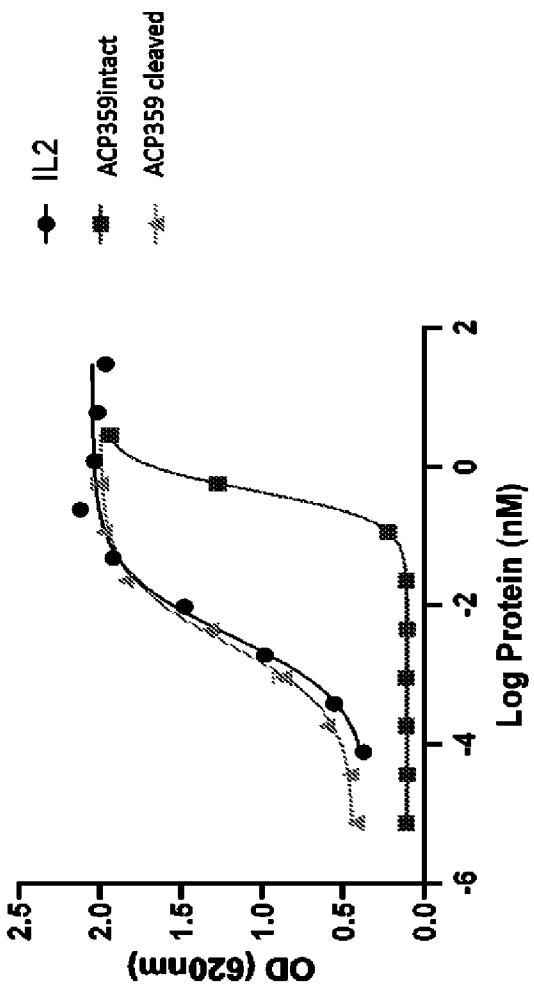

Intact
cleaved
Fc
IL-2 +L
IL-2
sdAb

FIG. 59L


IL2
ACP359intact
ACP359 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

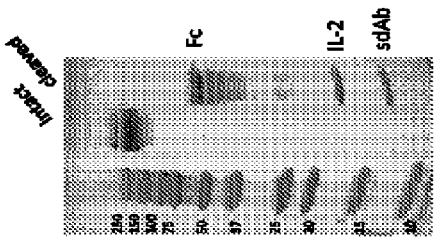
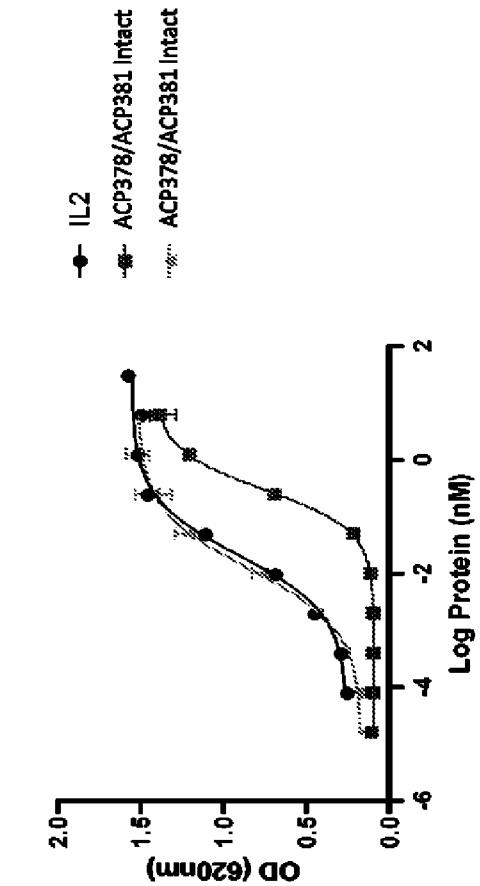

Intact
Cleaved
Fc
IL-2
scAb
250
150
100
75
50
37
25
20
15
10

FIG. 59M


IL2
ACP378/ACP381 Intact
ACP378/ACP381 Intact
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

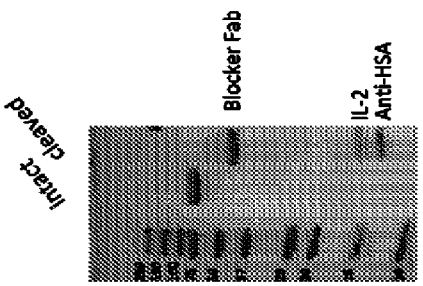
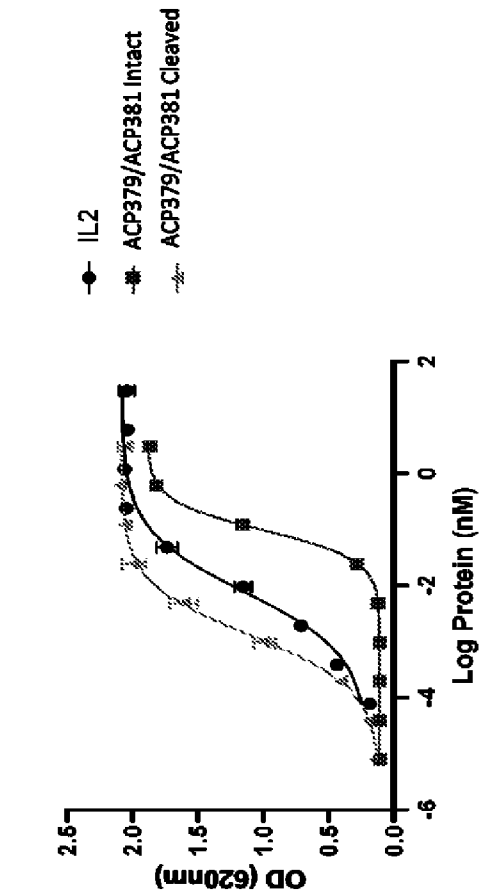

Intact
cleaved
Blocker Fab
IL-2
Anti-HSA

FIG. 59N


IL2
ACP379/ACP381 Intact
ACP379/ACP381 Cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

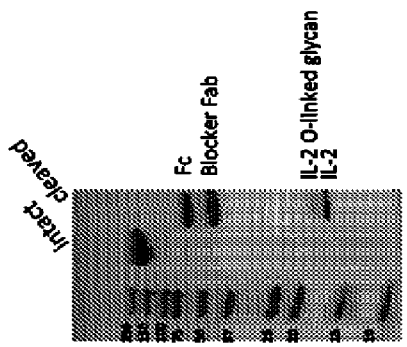
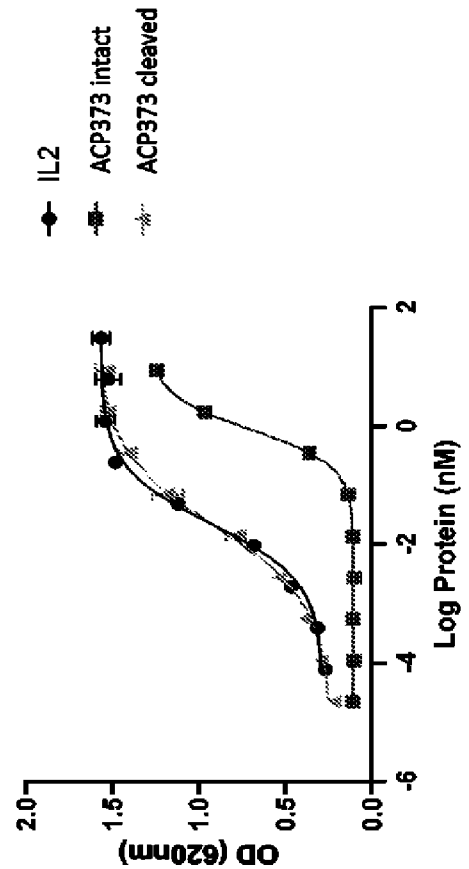

Intact
cleaved
Fc
Blocker Fab
IL-2 O-linked glycan
IL-2

FIG. 59O


IL2
ACP373 intact
ACP373 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

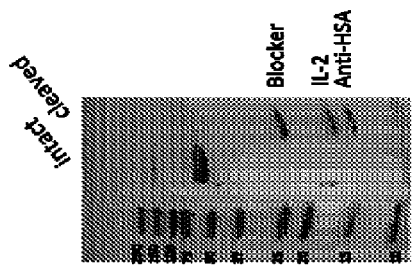
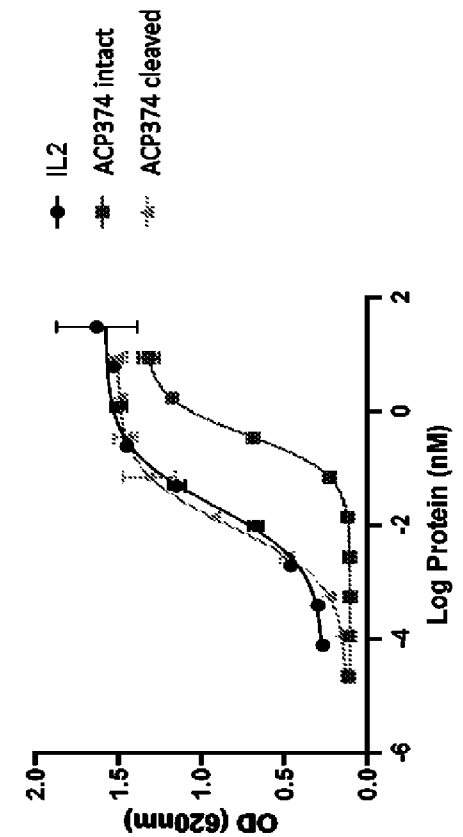

Intact
cleaved
Blocker
IL-2
Anti-HSA

FIG. 59P


IL2
ACP374 intact
ACP374 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

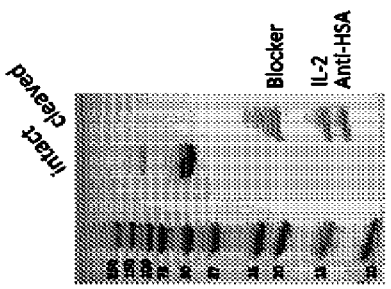
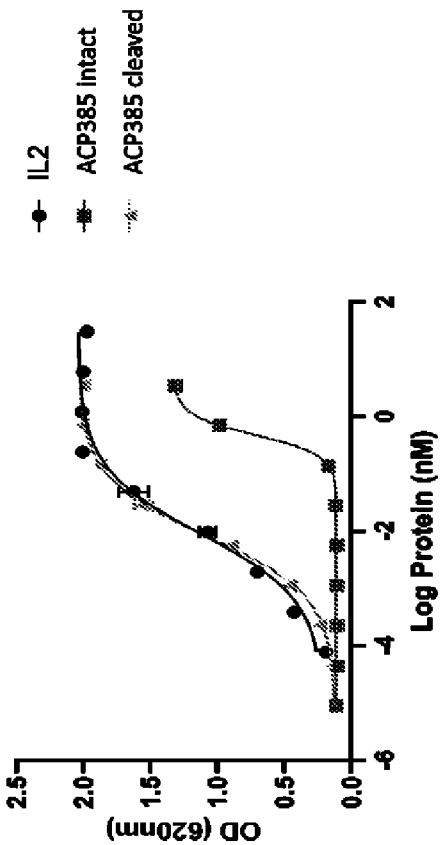

Blocker
IL-2
Anti-HSA
Intact
Cleaved

FIG. 59Q


IL2
ACP385 intact
ACP385 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

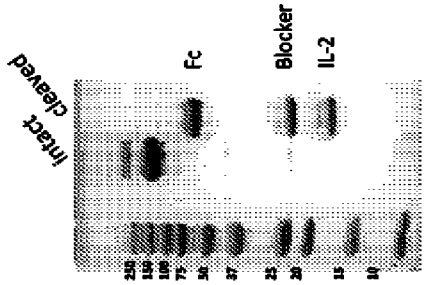
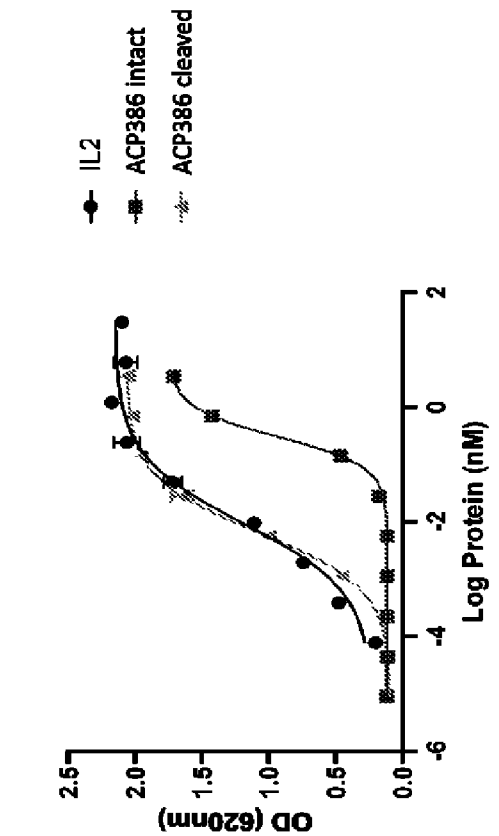

Intact
cleaved
Fc
Blocker
IL-2

FIG. 59R


IL2
ACP386 intact
ACP386 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

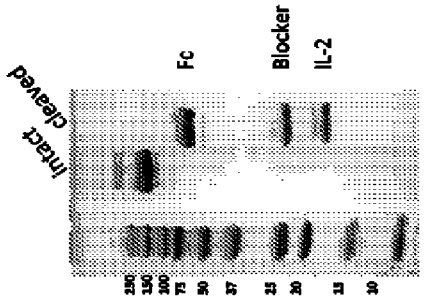
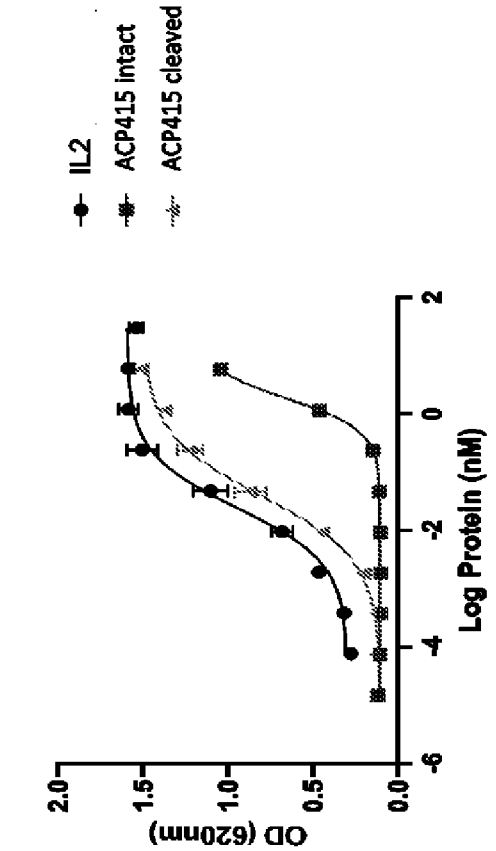

Intact
Cleaved
Fc
Blocker
IL-2

FIG. 59S


IL2
ACP415 intact
ACP415 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

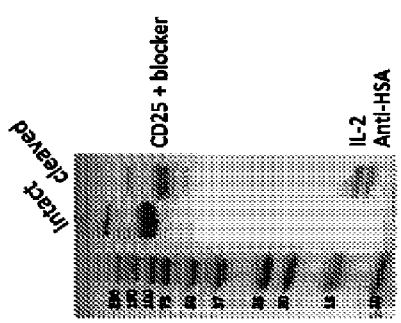
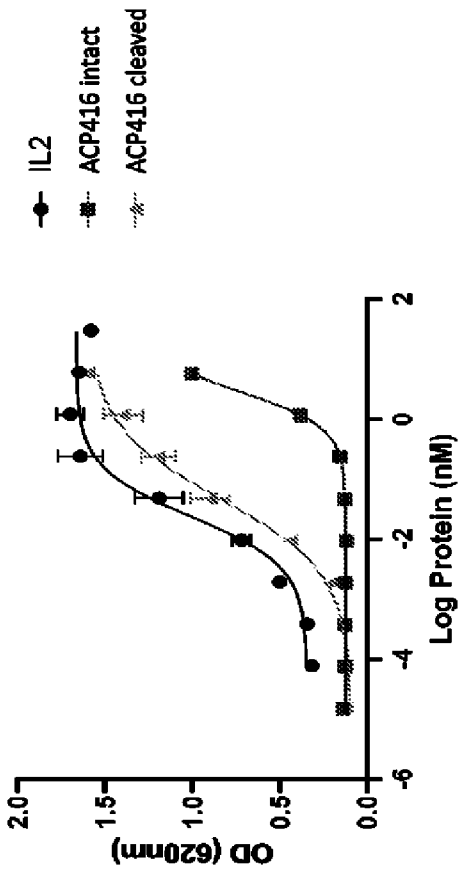

CD25 + blocker
IL-2
Anti-HSA
Intact
cleaved

FIG. 59T


IL2
ACP416 intact
ACP416 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

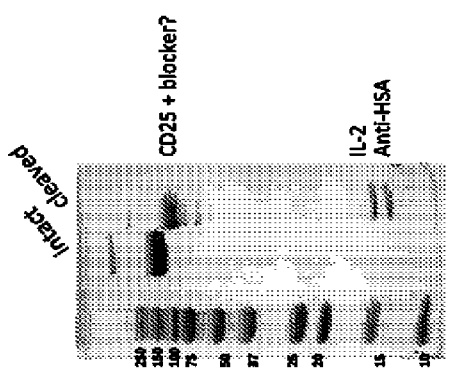

Intact
cleaved
CD25 + blocker?
IL-2
Anti-HSA

FIG. 59U

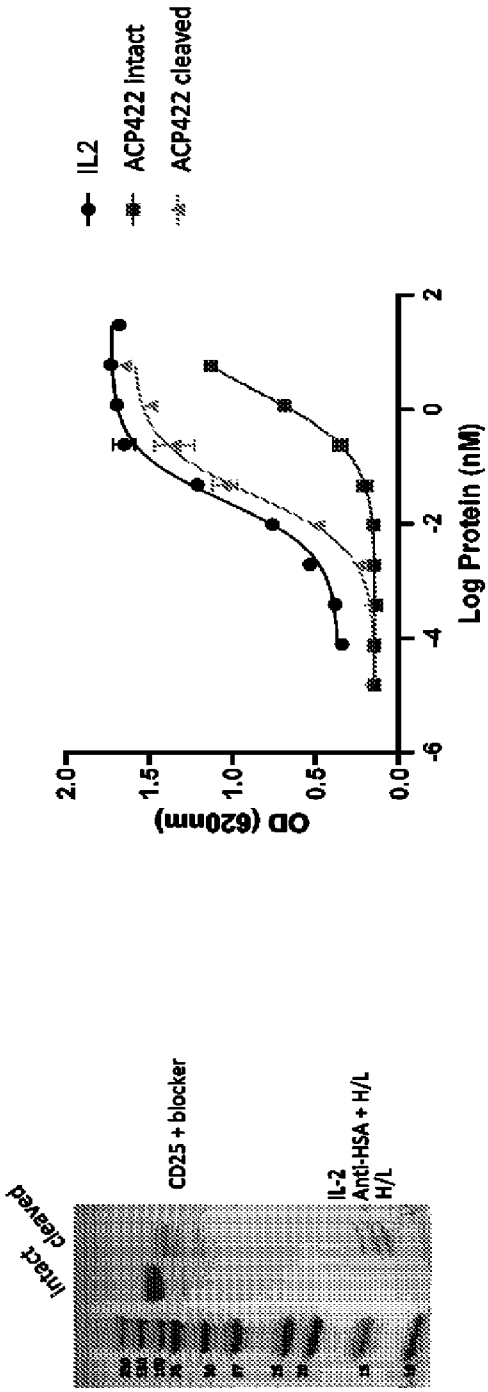

IL2
ACP422 intact
ACP422 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)
intact
cleaved
CD25 + blocker
IL-2
Anti-HSA + H/L
H/L

FIG. 59V

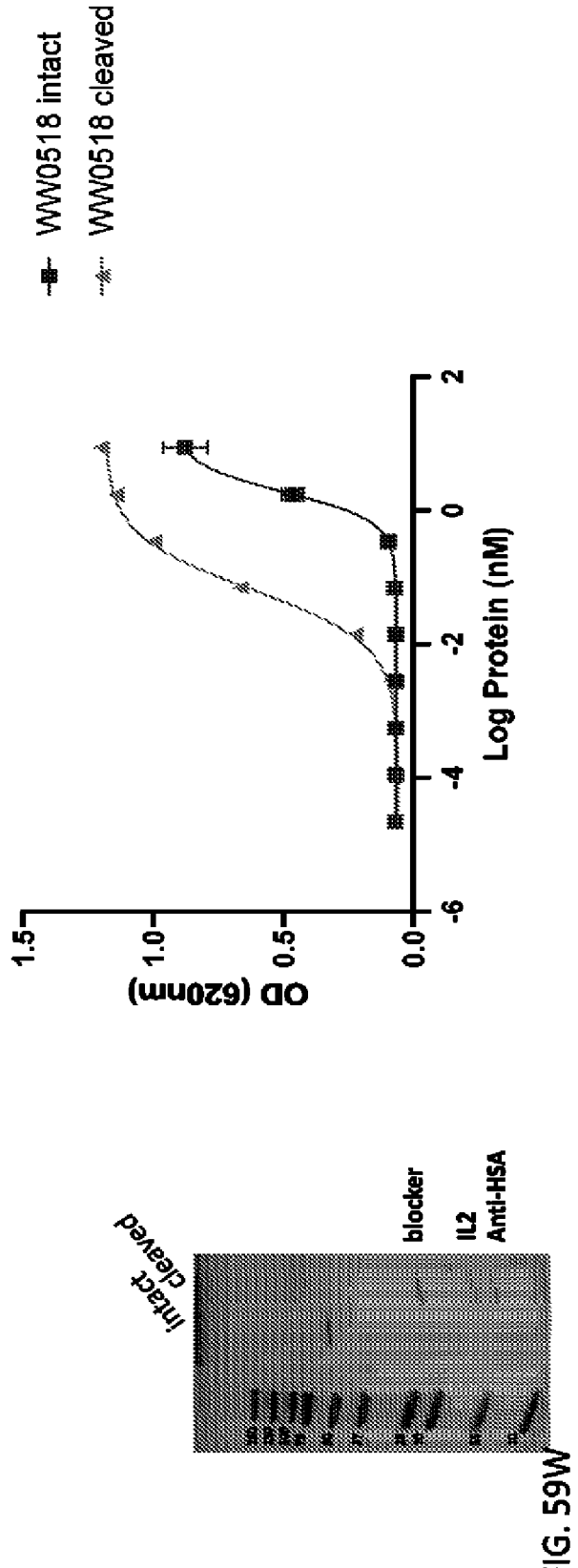
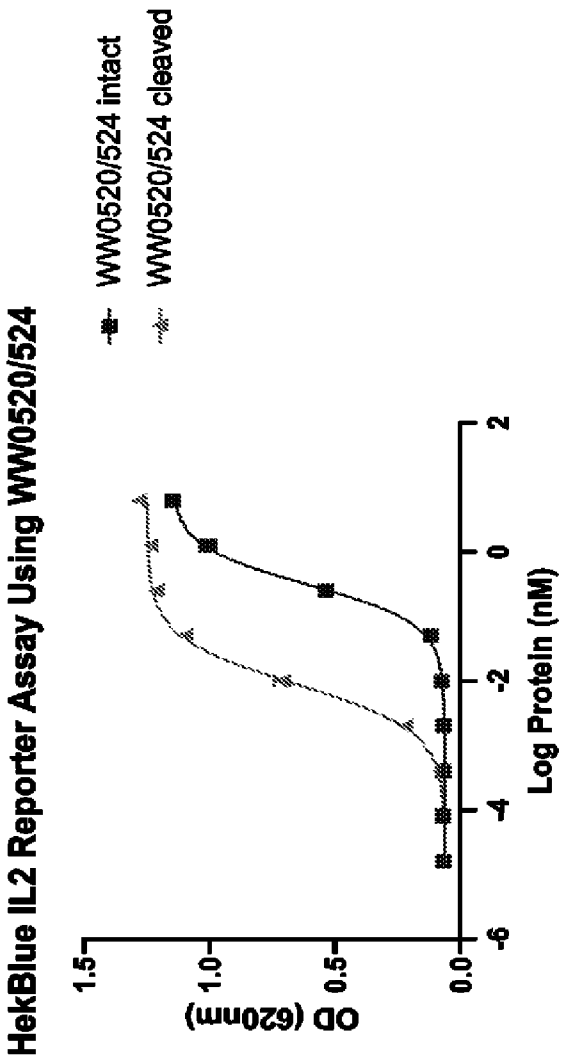

WW0518 intact
WW0518 cleaved
OD (620nm)
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)
Intact cleaved
blocker
IL2
Anti-HSA

FIG. 59W


HekBlue IL2 Reporter Assay Using WW0520/524
WW0520/524 intact
WW0520/524 cleaved
OD (620nm)
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

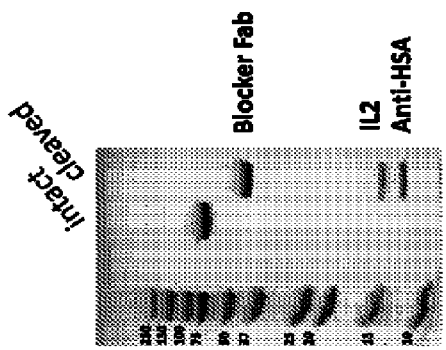
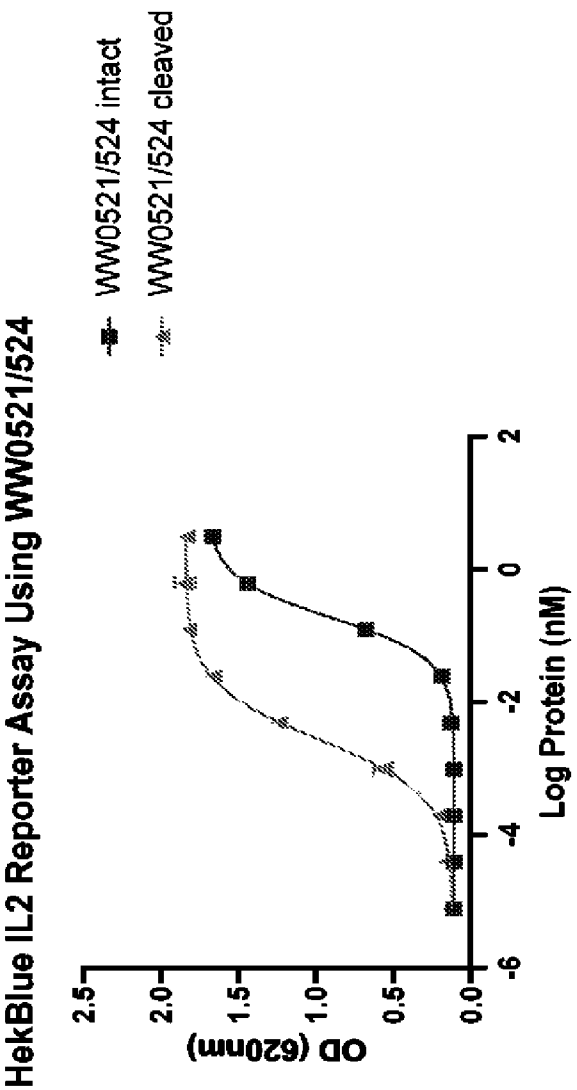

intact
cleaved
Blocker Fab
IL2
Anti-HSA

FIG. 59Z


HekBlue IL2 Reporter Assay Using WW0521/524
WW0521/524 intact
WW0521/524 cleaved
OD (620nm)
2.5
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

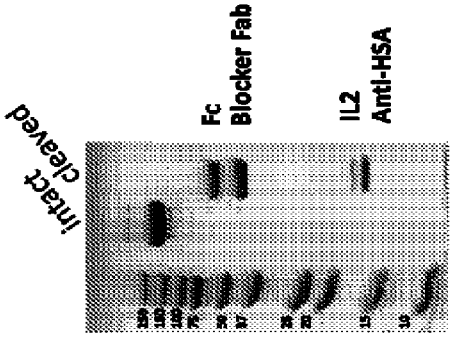
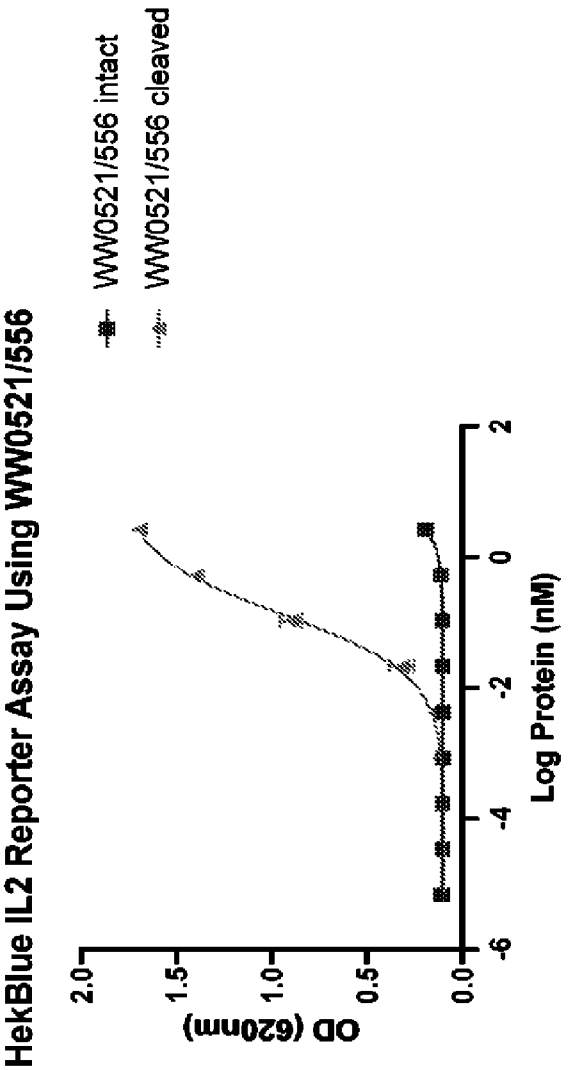

Intact
cleaved
Fc
Blocker Fab
IL2
Anti-HSA

FIG. 59Y


HekBlue IL2 Reporter Assay Using WW0521/556
WW0521/556 intact
WW0521/556 cleaved
OD (620nm)
2.0
1.5
1.0
0.5
0.0
-6
-4
-2
0
2
Log Protein (nM)

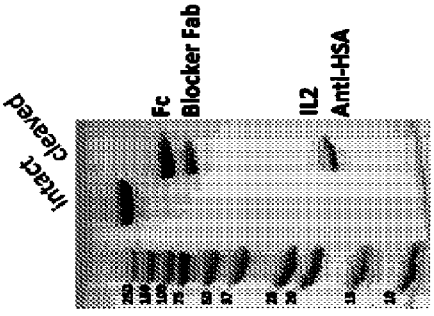

intact
cleaved
Fc
Blocker Fab
IL2
Anti-HSA

FIG. 59Z

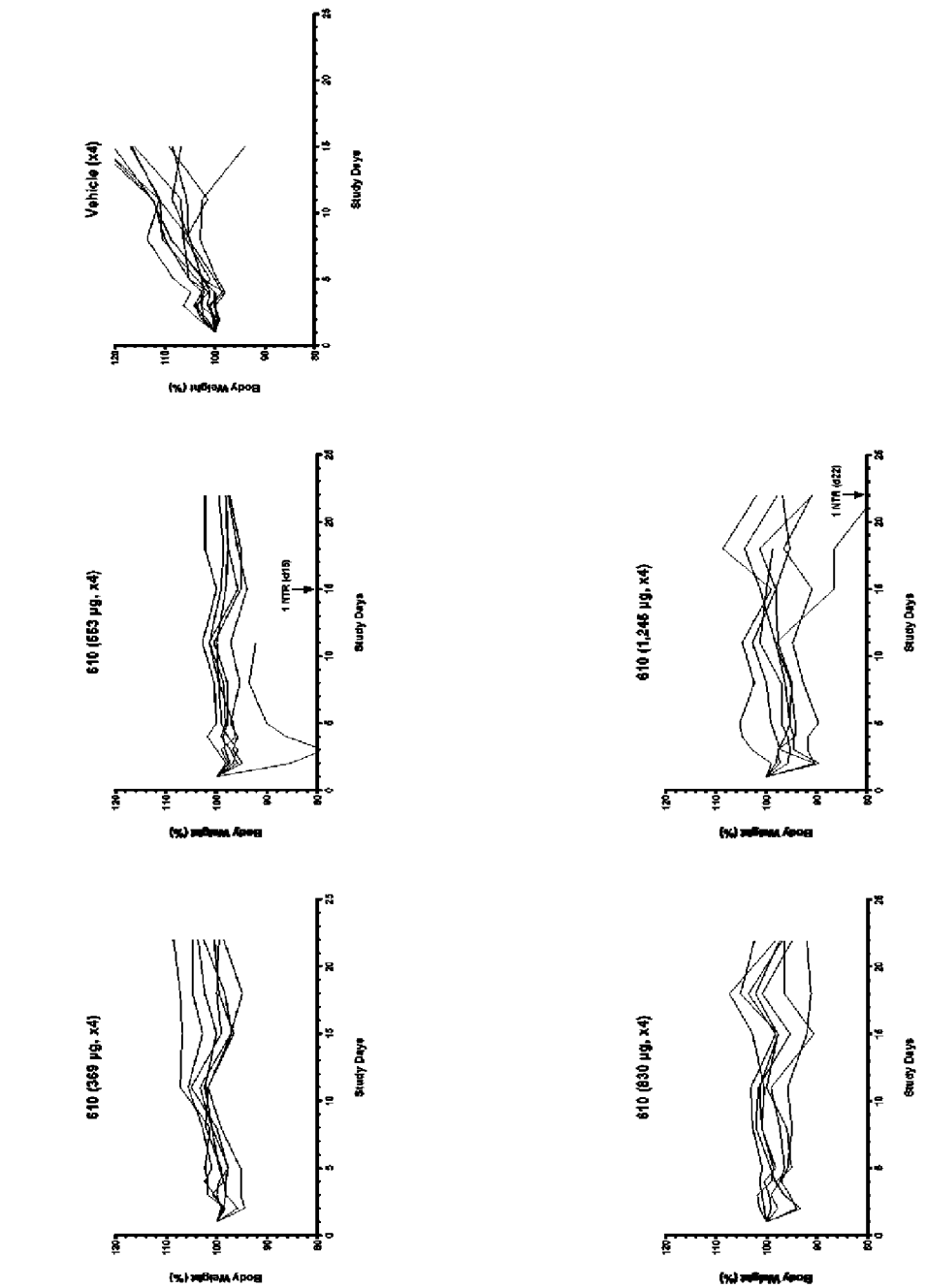

Vehicle (x4)
610 (553 µg, x4)
1 NTR (d19)
610 (1,245 µg, x4)
1 NTR (d22)
610 (369 µg, x4)
610 (830 µg, x4)
Body Weight (%)
Study Days

FIG. 60A

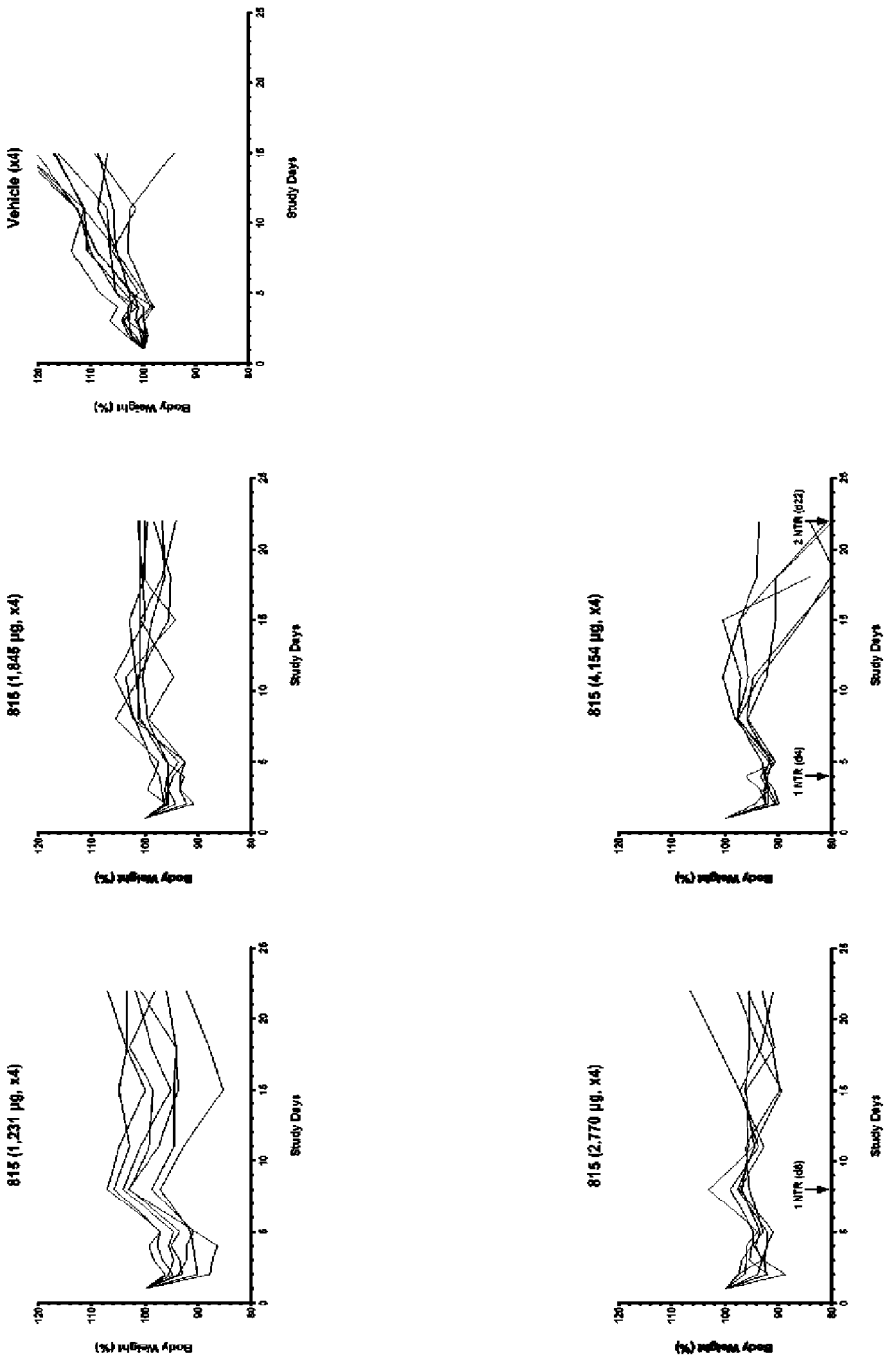

Vehicle (x4)
815 (1,231 µg, x4)
816 (1,845 µg, x4)
815 (2,770 µg, x4)
815 (4,154 µg, x4)
Body Weight (%)
Study Days
1 NTR (d8)
1 NTR (d4)
2 NTR (d22)

FIG. 60B

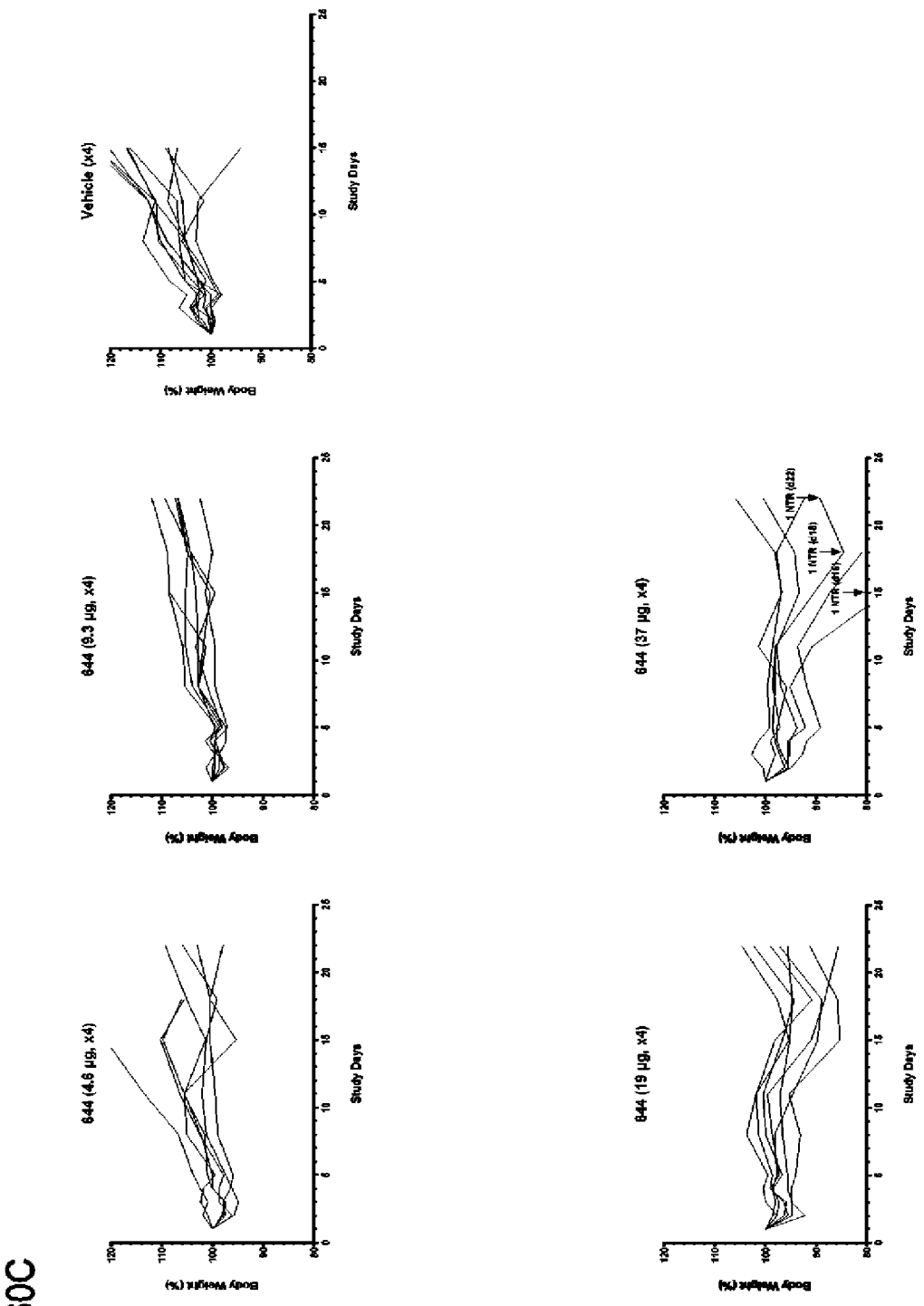

Vehicle (x4)
644 (9.3 µg, x4)
644 (4.6 µg, x4)
644 (37 µg, x4)
644 (19 µg, x4)
Body Weight (%)
Study Days
1 NTR (d22)
1 NTR (d16)
1 NTR (d10)

FIG. 60C

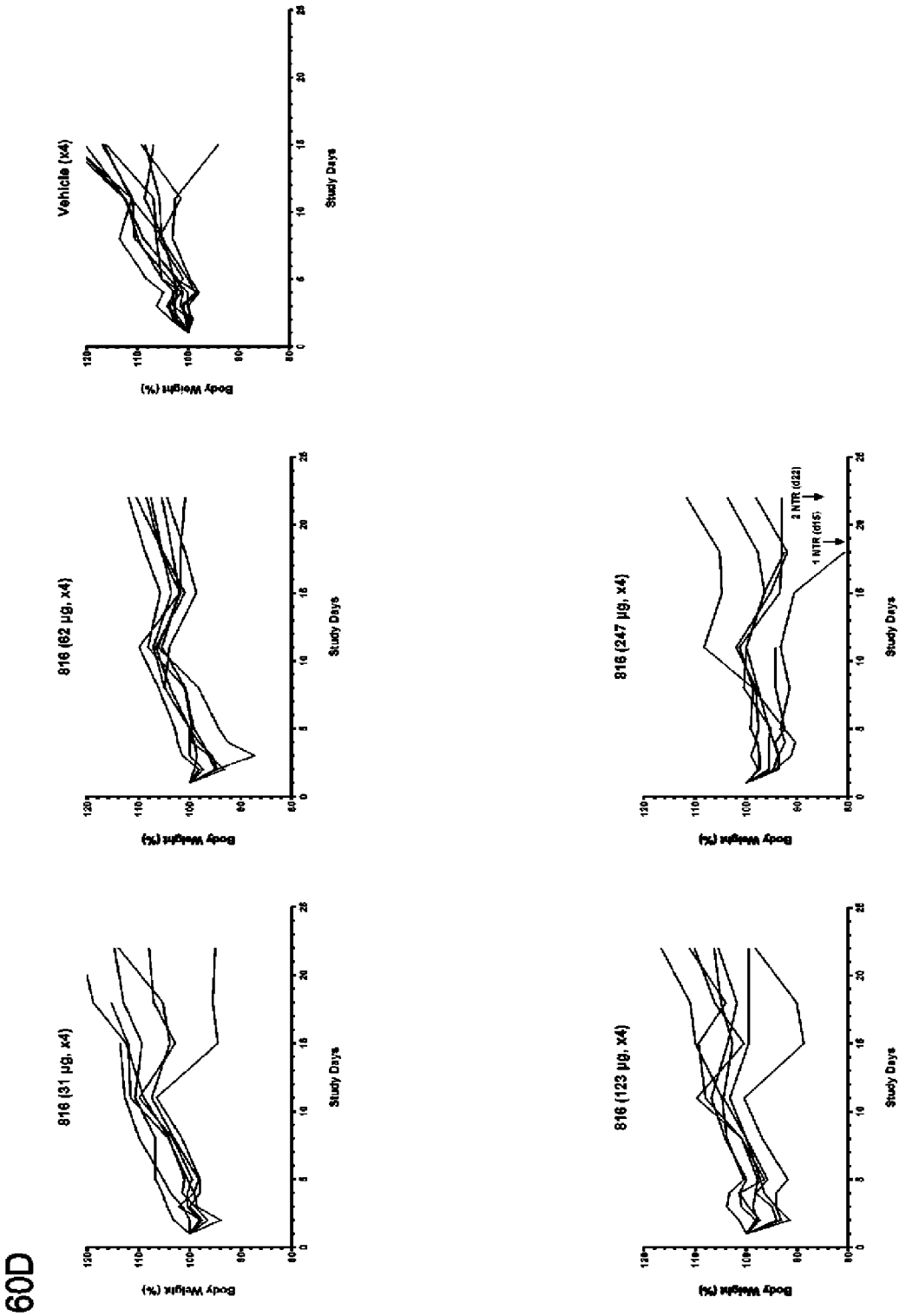

Vehicle (x4)
816 (62 µg, x4)
816 (247 µg, x4)
816 (31 µg, x4)
816 (123 µg, x4)
Body Weight (%)
Study Days
2 NTR (d22)
1 NTR (d15)

FIG. 60D

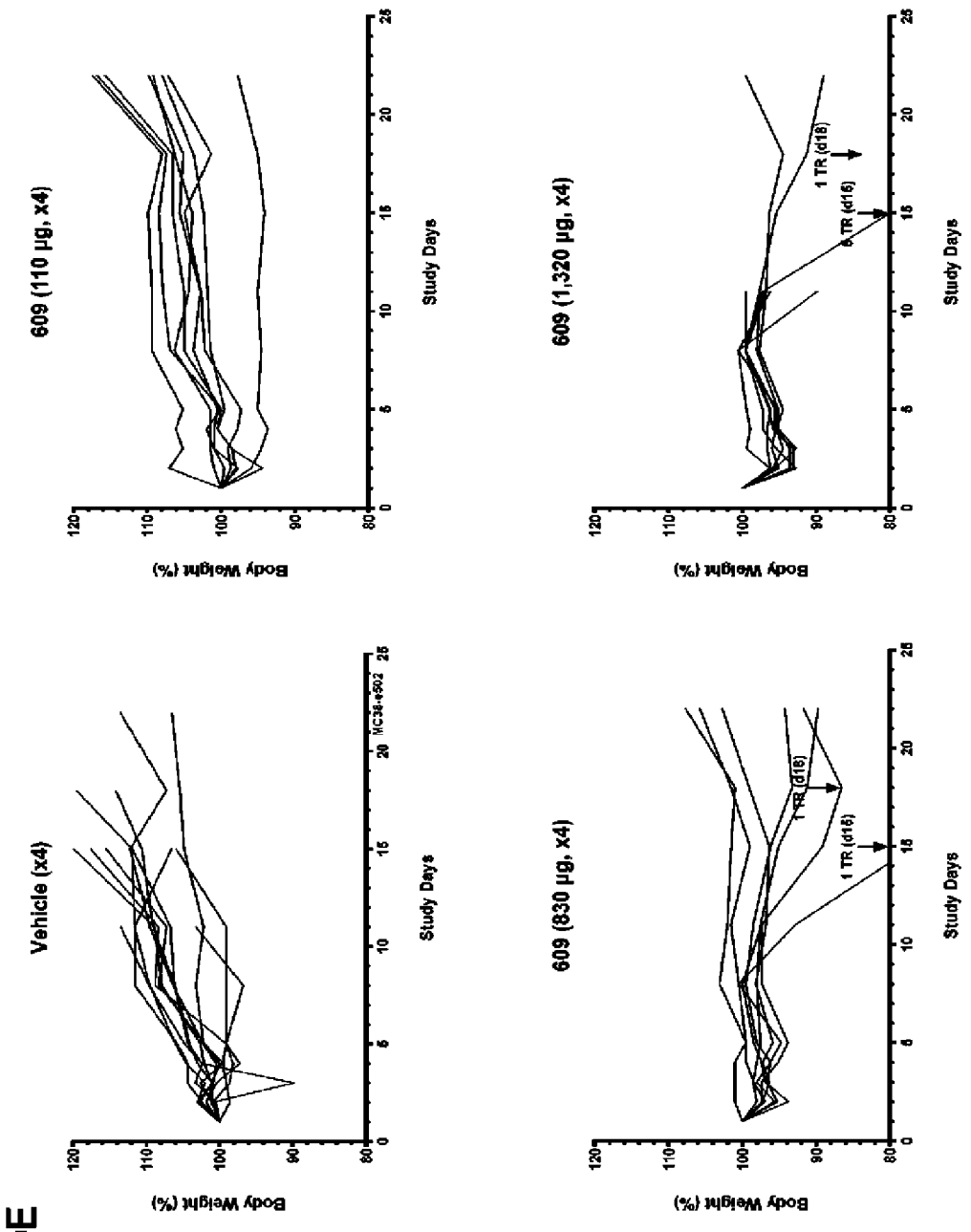

609 (110 µg, x4)
609 (1,320 µg, x4)
Vehicle (x4)
609 (830 µg, x4)
Body Weight (%)
Study Days
1 TR (d16)
MC38-hSO2

FIG. 60E

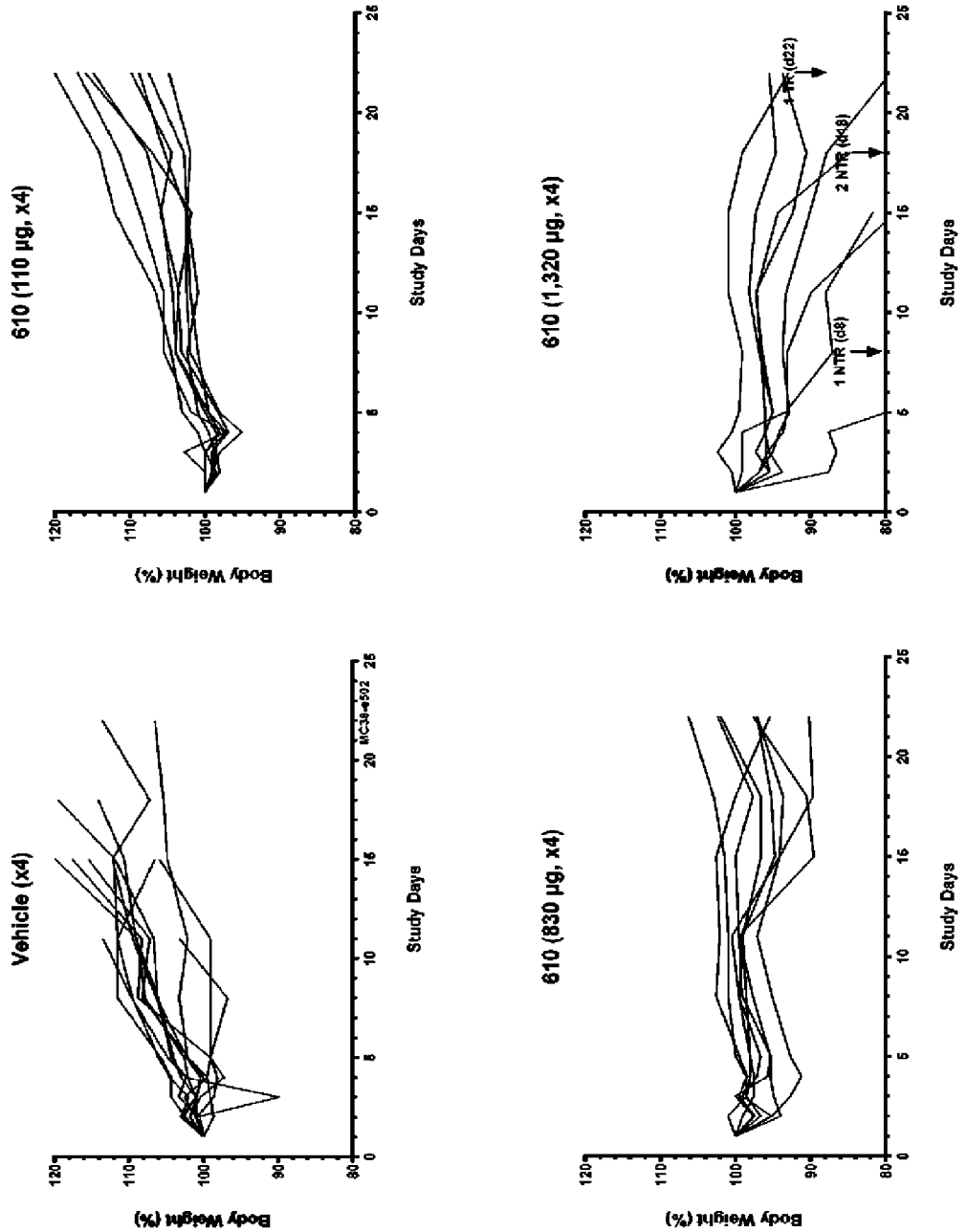

610 (110 µg, x4)
610 (1,320 µg, x4)
Vehicle (x4)
610 (830 µg, x4)
Body Weight (%)
Study Days
1 NTR (d8)
2 NTR (d15)
4 NTR (d22)
MC38-s502

FIG. 60F

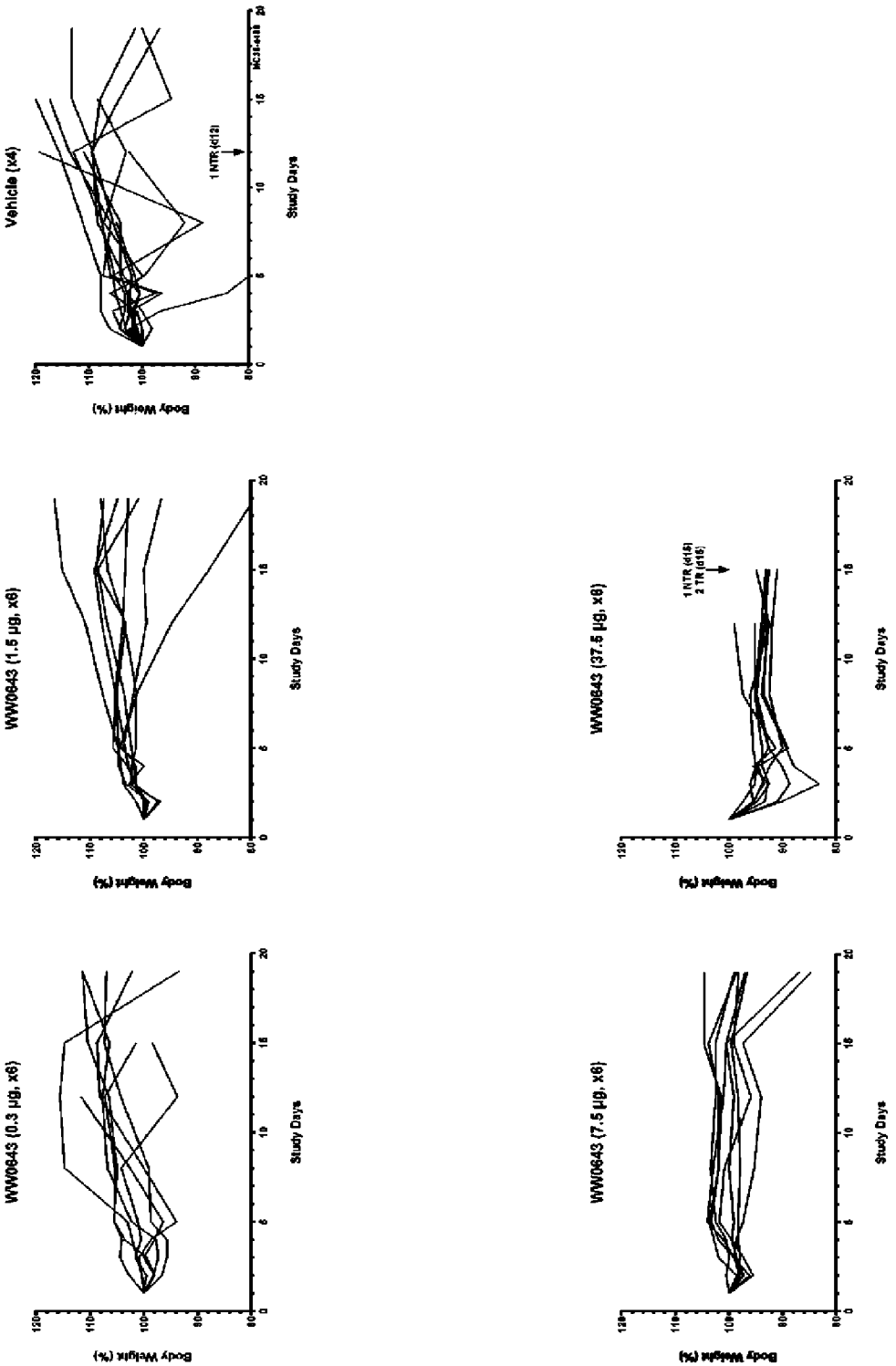
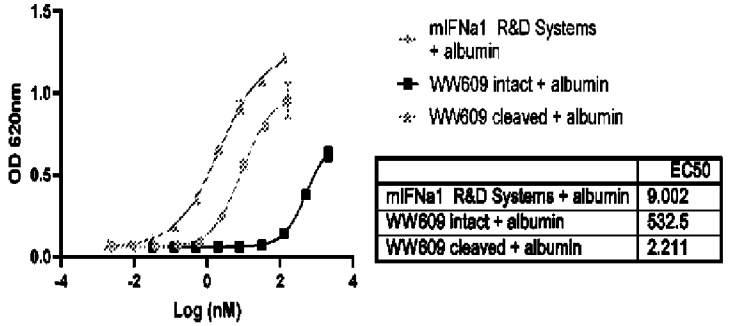

Vehicle (x4)
1 NTR (d12)
WW0643 (1.5 µg, x6)
WW0643 (37.5 µg, x6)
1 NTR (d15)
2 TR (d15)
WW0643 (0.3 µg, x6)
WW0643 (7.5 µg, x6)
Body Weight (%)
Study Days

FIG. 60G

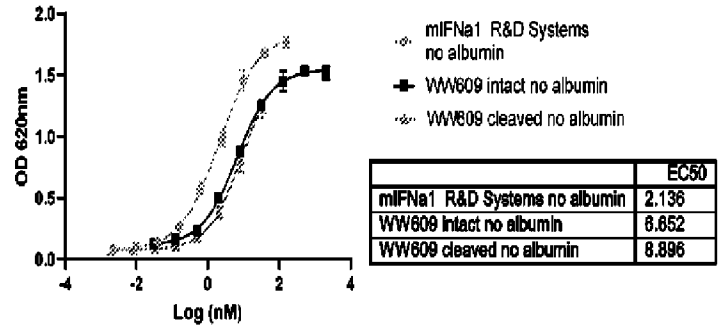
FIG. 61A

B16 Blue mIFNab Reporter assay with WW609 + Albumin



	EC50
mIFNa1 R&D Systems + albumin	9.002
WW609 intact + albumin	532.5
WW609 cleaved + albumin	2.211

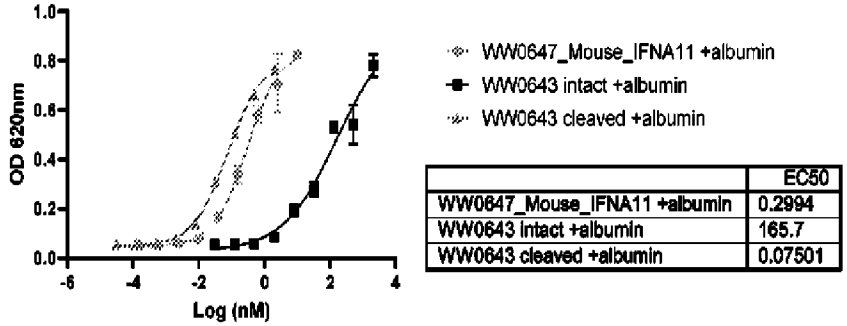
B16 Blue mIFNab Reporter assay with WW609 no Albumin



	EC50
mIFNa1 R&D Systems no albumin	2.136
WW609 intact no albumin	6.652
WW609 cleaved no albumin	8.896

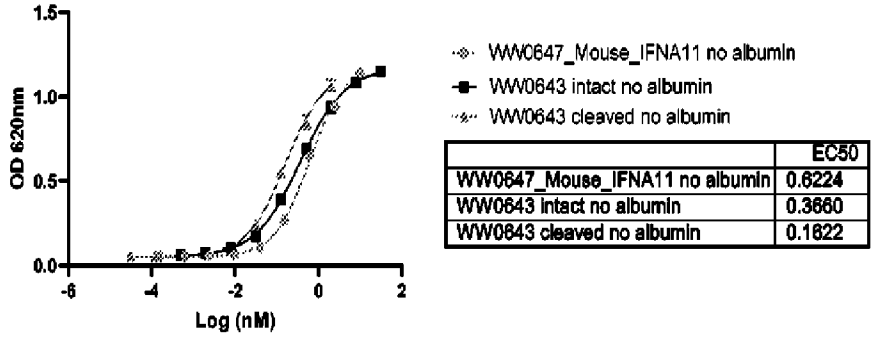
FIG. 61B

B16 Blue mIFNab Reporter assay with WW0643 + Albumin



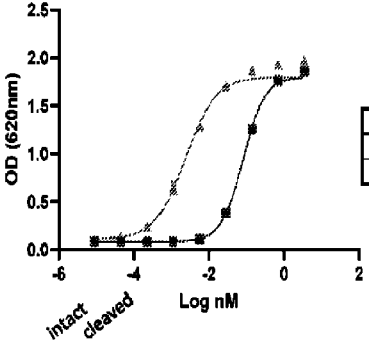
	EC50
WW0647_Mouse_IFNA11 +albumin	0.2994
WW0643 intact +albumin	165.7
WW0643 cleaved +albumin	0.07501

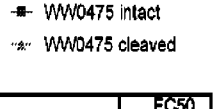
B16 Blue mIFNab Reporter assay with WW0643 no albumin



	EC50
WW0647_Mouse_IFNA11 no albumin	0.6224
WW0643 intact no albumin	0.3660
WW0643 cleaved no albumin	0.1822

FIG. 1A





	EC50
WW0475 intact	0.08201
WW0475 cleaved	0.002405

