Innovation, Sciences et Développement économique Canada
Office de la Propriété Intellectuelle du Canada

Innovation, Science and Economic Development Canada
Canadian Intellectual Property Office

CA 3065919 A1 2018/12/13

(21) 3 065 919

(12) DEMANDE DE BREVET CANADIEN
CANADIAN PATENT APPLICATION

(13) A1

(86) Date de dépôt PCT/PCT Filing Date: 2018/06/07
(87) Date publication PCT/PCT Publication Date: 2018/12/13
(85) Entrée phase nationale/National Entry: 2019/12/02
(86) N° demande PCT/PCT Application No.: US 2018/036560
(87) N° publication PCT/PCT Publication No.: 2018/227023
(30) Priorité/Priority: 2017/06/07 (US62/516,667)

(51) Cl.Int./Int.Cl. *A61K 31/4025* (2006.01), *A61K 47/68* (2017.01), *A61P 35/00* (2006.01)

(71) Demandeur/Applicant:
SILVERBACK THERAPEUTICS, INC., US

(72) Inventeurs/Inventors:
THOMPSON, PETER ARMSTRONG, US;
EDRIS, BADREDDIN, US;
COBURN, CRAIG ALAN, US;
BAUM, PETER ROBERT, US

(74) Agent: GOWLING WLG (CANADA) LLP

(54) Titre : CONJUGUES DE CONSTRUCTION D'ANTICORPS
(54) Title: ANTIBODY CONSTRUCT CONJUGATES

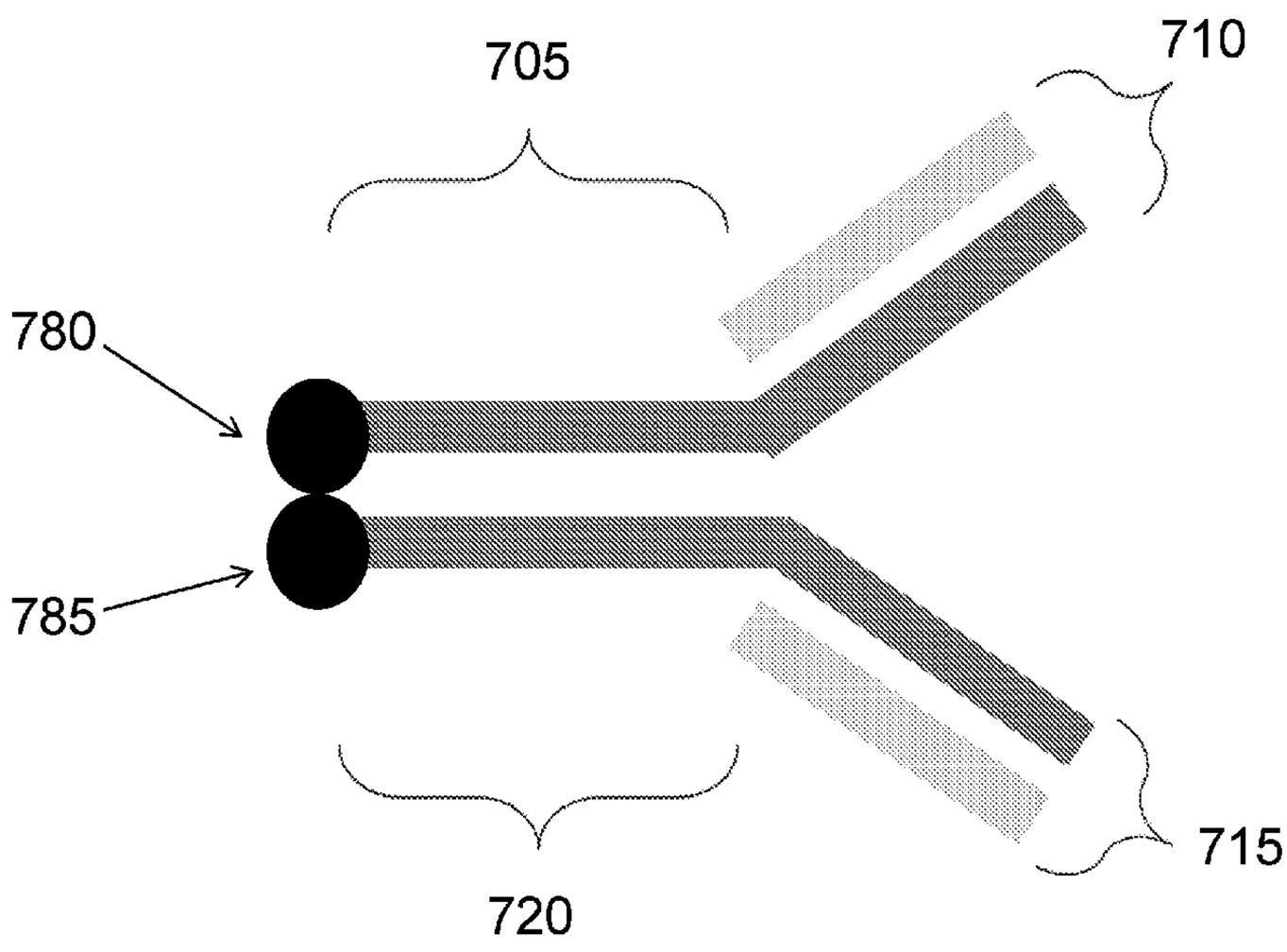


FIGURE 1

(57) Abrégé/Abstract:
Various compositions are disclosed. The compositions of composition-immune stimulatory compound conjugates are also provided. Additionally provided are the methods of preparation and uses of the composition-immune stimulatory compound conjugates. This includes methods for treating disorders, such as cancer.

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
13 December 2018 (13.12.2018)

WIPO | PCT

(10) International Publication Number
WO 2018/227023 A1

(51) International Patent Classification:
A61K 31/4025 (2006.01) *C07D 417/12* (2006.01)
C07D 207/16 (2006.01) *C07D 417/14* (2006.01)

(21) International Application Number:
PCT/US2018/036560

(22) International Filing Date:
07 June 2018 (07.06.2018)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/516,667 07 June 2017 (07.06.2017) US

(71) Applicant: **SILVERBACK THERAPEUTICS, INC.** [US/US]; 500 Fairview Avenue North, Suite 600, Seattle, Washington 98109 (US).

(72) Inventors: **THOMPSON, Peter Armstrong**; 500 Fairview Avenue North, Suite 600, Seattle, Washington 98109 (US). **EDRIS, Badreddin**; 500 Fairview Avenue North, Suite 600, Seattle, Washington 98109 (US). **COBURN, Craig Alan**; 500 Fairview Avenue North, Suite 600, Seattle, Washington 98109 (US). **BAUM, Peter Robert**; 500 Fairview Avenue North, Suite 600, Seattle, Washington 98109 (US).

(74) Agent: **HOLZAPFEL, Keli L.** et al.; WILSON SONSINI GOODRICH & ROSATI, 650 Page Mill Road, Palo Alto, California 94304-1050 (US).

(81) Designated States *(unless otherwise indicated, for every kind of national protection available)*: AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,

(54) Title: ANTIBODY CONSTRUCT CONJUGATES

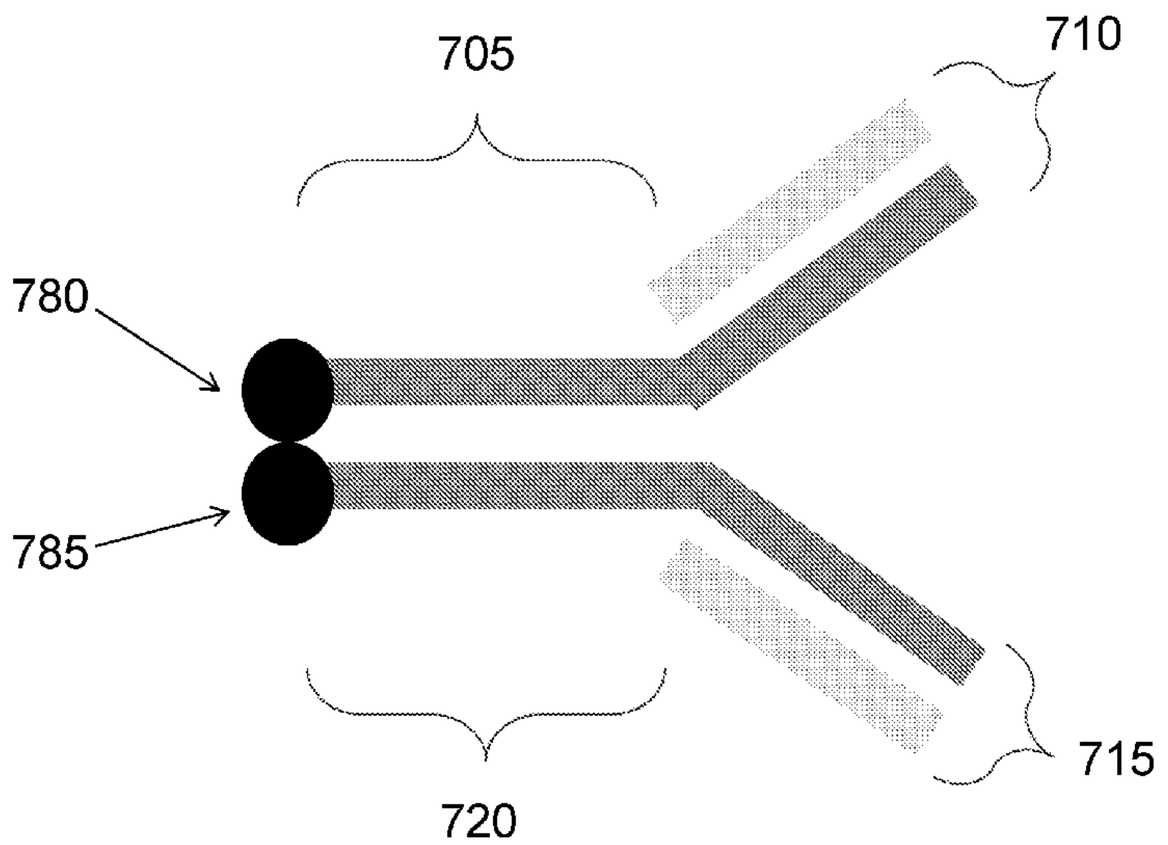


FIGURE 1

(57) Abstract: Various compositions are disclosed. The compositions of composition-immune stimulatory compound conjugates are also provided. Additionally provided are the methods of preparation and uses of the composition-immune stimulatory compound conjugates. This includes methods for treating disorders, such as cancer.

[Continued on next page]

WO 2018/227023 A1

WO 2018/227023 A1

MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

— *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

— *with international search report (Art. 21(3))*

— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*

DEMANDE OU BREVET VOLUMINEUX

LA PRÉSENTE PARTIE DE CETTE DEMANDE OU CE BREVET COMPREND PLUS D'UN TOME.

CECI EST LE TOME 1 DE 2
CONTENANT LES PAGES 1 À 207

NOTE : Pour les tomes additionels, veuillez contacter le Bureau canadien des brevets

JUMBO APPLICATIONS/PATENTS

THIS SECTION OF THE APPLICATION/PATENT CONTAINS MORE THAN ONE VOLUME

THIS IS VOLUME 1 OF 2
CONTAINING PAGES 1 TO 207

NOTE: For additional volumes, please contact the Canadian Patent Office

NOM DU FICHIER / FILE NAME :

NOTE POUR LE TOME / VOLUME NOTE:

ANTIBODY CONSTRUCT CONJUGATES

PRIORITY

[0001] This application claims the benefit of priority under 35 U.S.C. § 119(e) to U.S. Provisional Application No. 62/516,667, filed June 7, 2017, the disclosure of which is incorporated herein by reference in its entirety.

BACKGROUND

[0002] One of the leading causes of death in the United States is cancer. The conventional methods of cancer treatment, like chemotherapy, surgery, or radiation therapy, tend to be either highly toxic or nonspecific to a cancer, or both, resulting in limited efficacy and harmful side effects. However, the immune system has the potential to be a powerful, specific tool in fighting cancers. In many cases tumors can specifically express genes whose products are required for inducing or maintaining the malignant state. These proteins may serve as antigen markers for the development and establishment of more specific anti-cancer immune response. The immune response may include the recruitment of immune cells that target tumors expressing these antigen markers. Additionally, the immune cells may express genes whose products are important to proper immune function and may serve as markers for specific types of immune cells. The boosting of this specific immune response has the potential to be a powerful anti-cancer treatment that can be more effective than conventional methods of cancer treatment and can have fewer side effects.

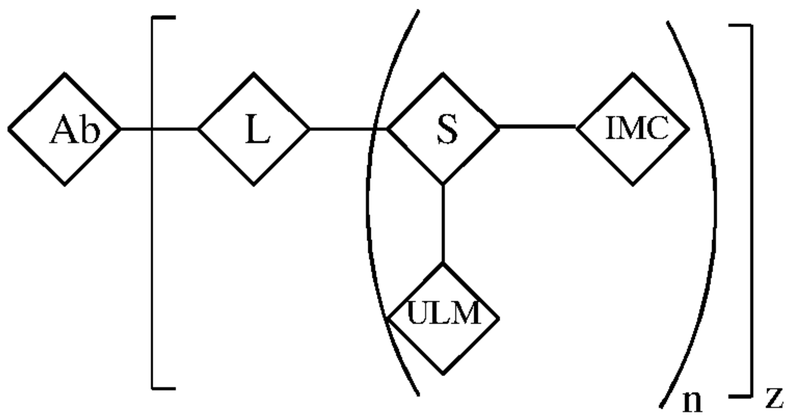
INCORPORATION BY REFERENCE

[0003] All publications, patents, and patent applications mentioned in this specification are herein incorporated by reference to the same extent as if each individual publication, patent, or patent application was specifically and individually indicated to be incorporated by reference.

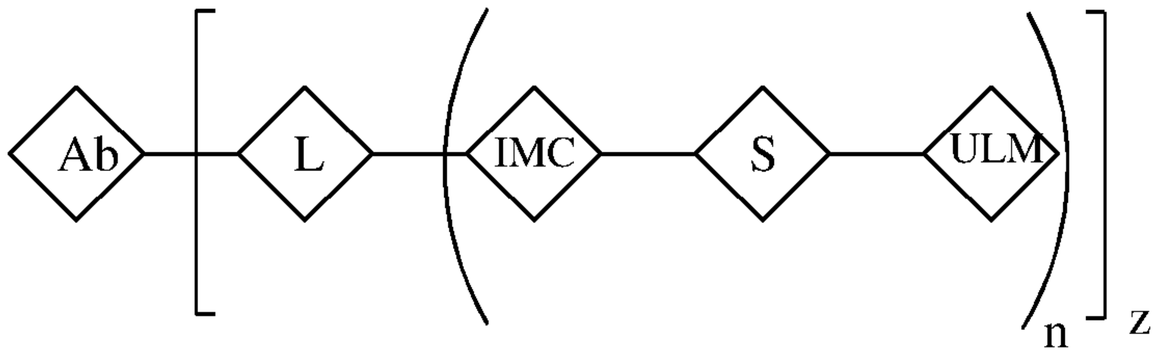
SUMMARY

[0004] Provided herein are immune-modulatory and immune-stimulatory conjugates. In certain embodiments, an immune-modulatory conjugate is provided comprising: (a) an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to a first antigen; (b) a proteolysis targeting module, comprising: (i) a protein targeting moiety that binds to a target protein; (ii) an E3 ubiquitin ligase binding moiety; and (iii) a spacer S that is covalently bound to the protein targeting moiety and to the E3 ubiquitin ligase binding moiety, wherein the spacer is optionally has 1-25 consecutive non-hydrogen atoms; and

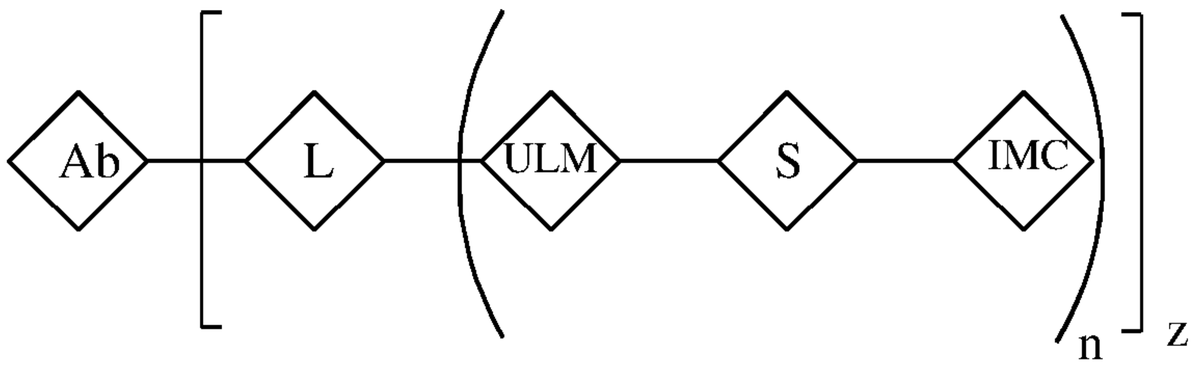
(c) a linker L that is covalently attached to the antibody construct and to the proteolysis targeting module. The conjugate can be represented by one of the following formulae:



(VII),



(VIII), or



(IX),

wherein: Ab is the antibody construct; L is the linker; ULM is the E3 ubiquitin ligase binding moiety; IMC is the protein targeting moiety and comprises an immune-modulatory compound; S is the spacer; n is selected from 1 to 20; and z is selected from 1 to 20. In some embodiments, the Fc domain of the conjugate is an Fc null.

[0005] In some embodiments, the E3 ubiquitin ligase is selected from the group consisting of Von Hippel-Lindaue E3 ubiquitin ligase (VHL), cereblon, mouse double minute 2 homolog (MDM2), AMFR, APC/Cdc20, APC/Cdh1, C6orf157, Cbl, CBLL1, CHFR, CHIP, DTL (Cdt2), E6-AP, HACE1, HECTD1, HECTD2, HECTD3, HECW1, HECW2, HERC2, HERC3, HERC4, HERC5, HUWE1, HYD, ITCH, LNX1, mahogunin, MARCH-I, MARCH-II, MARCH-III, MARCH-IV, MARCH-VI, MARCH-VII, MARCH-VIII, MARCH-X, MEKK1, MIB1, MIB2, MycBP2, NEDD4, NEDD4L, Parkin, PELI1, Pirh2, PJA1, PJA2, RFFL, RFWD2, Rictor, RNF5, RNF8, RNF19, RNF190, RNF20, RNF34, RNF40, RNF125, RNF128, RNF138, RNF168, SCF/?-TrCP, SCF/FBW7, SCF/Skp2, SHPRH, SIAH1, SIAH2, SMURF1, SMURF2, TOPORS,

TRAF6, TRAF7, TRIM63, UBE3B, UBE3C, UBR1, UBR2, UHRF2, WWP1, WWP2, and ZNRF1. In some further embodiments, the E3 ubiquitin ligase binding moiety binds to VHL, cereblon or MDM2.

[0006] In some embodiments, the protein targeting moiety binds to a protein selected from one of the groups consisting of: a) an aryl hydrocarbon receptor, androgen receptor, estrogen receptor, FK506-binding protein 12, fibroblast growth factor receptor substrate 2, phosphatidylinositol -4,5-biphosphate 3-kinase, SMAD family member 3, bromodomain and extra-territorial family of proteins (BET), bromodomain-containing protein 4 member of the BET family, Abelson tyrosine kinase, receptor-interacting serine/threonine-protein kinase 1, estrogen-related receptor, and transforming growth factor beta (TGFβ); or b) ALK, Bcr-Abl, BRAF, BTK, c-KIT, EGFR, ErbB2, JAK, MEK, MET, PDGFRB, RET, ROS1, Syk, SRC, TNIK, TNKS, TNKS2, TrkA, TrkB, TrkC, VEGFR1, VEGFR2, VEGFR3, FGFR1, FGFR2, FGFR3, FGFR4, CSF1R, RON/MST1R, TYRO3, MERTK, AXL, PI3K, PI3K, MAP4K1, PERK, and KIT; or c) TGFβR2, TGFβR1, SMAD2, SMAD3, SMAD4, beta-catenin, CREBB2, Beta catenin/TCF4, beta catenin/LEF, beta catenin/CREBBP, YAP, TAZ, YAP/TAZ, TNKS1, TNKS2, MST1, MST2, NRAS, HRAS, KRAS, RASmut12, RASmut13, PERK (EIF2AK3), RON/MST1R, STAT3, MCT1, MCT2 and MCT4; or d) CSFR1, RON/MST1, PI3Kd, PI3Kg, PARP1, PD-L1, PP2A, A2ar, TYRO3, AXL and MER.

[0007] In some embodiments, the first antigen is a tumor antigen. The tumor antigen can be MUC16, CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC, HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Ley, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, v 3, WT1, LMP2, HPV E6, HPV E7, EGFRvIII, Her-2/neu, MAGE A3, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyronsinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint fusion protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, MUC15, CA6, NAPI2B, TROP2, CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, LIV1, ROR1, or Fos-related antigen 1.

[0008] In some embodiments, the first antigen is an immune cell antigen, and can be an antigen present on the surface of an antigen presenting cell such as a dendritic cell or a macrophage. In some embodiments, the immune cell antigen is selected from the group consisting of CD40, DEC-205, PD-L1, PD-1, CD36 mannose scavenger receptor 1, CLEC9A, DC-SIGN, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, and CD32B.

[0009] In some embodiments, the protein targeting moiety can be a peptide or a non-proteinaceous molecule. In some embodiments, the proteolysis targeting module is selected from compounds 1-1, 1-2, 1-3, 1-4, 1-5, 1-6 and 2-1, as disclosed herein. In some embodiments, the linker L is a cleavable linker. In some embodiments, the linker L is a non-cleavable linker. In some embodiments, the linker L is covalently bound to the antibody construct at a cysteine residue, an engineered cysteine residue, a lysine residue, a glutamate residue, or a glutamine residue of the antibody construct or is covalently bound to the antibody construct using a Sortase linker.

[0010] In some embodiments, the spacer S is an optionally substituted C_{1-25} alkylene or optionally substituted C_{1-25} heteroalkylene, wherein the heteroalkylene is a C_{1-24} alkylene chain interspersed with one or more groups independently selected from: -O-, -S-, -NH_2-, and -C(O)NH-; and optionally substituted with a reactive group, R^X, that can form a functional group selected from an amide bond, an ester bond, an ether bond, a carbonate bond, a carbamate bond, or a thioether bond. The spacer can be optionally substituted with C_1-C_8 alkyl, C_2-C_8 alkenyl, C_2-C_8 alkynyl, -$(CH_2O)_{n1}H$, -$(CH_2CH_2O)_{n1}H$, -$(CH_2O)_{n1}CH_3$, -C(O)OH or -NH_2, wherein n1 is from 1 to 8. In some embodiments the spacer is substituted with R^x. In some embodiments, the linker is unsubstituted.

[0011] In some embodiments, the antibody construct further comprises a second binding domain. The second binding domain can specifically bind to an antigen on an immune cell. The immune cell antigen is selected from the group consisting of CD40, PD-1, PD-L1, DEC-205, CD36 mannose scavenger receptor 1, CLEC9A, DC-SIGN, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, and CD32B. In some embodiments, the second binding domain is attached to the antibody construct at a C-terminal end of the Fc domain.

[0012] In some embodiments, the Fc domain is an Fc domain variant comprising at least one amino acid residue change as compared to a wild type sequence of the Fc domain. In some embodiments, the Fc domain is an Fc domain variant that decreases binding of the Fc domain to an Fc receptor. In some embodiments, the at least one amino acid residue change in the Fc domain is: a) F243L, R292P, Y300L, L235V, and P396L, wherein numbering of amino acid

residues in the Fc domain is relative to SEQ ID NO: 898; b) S239D and I332E, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898; or c) S298A, E333A, and K334A, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898. In some embodiments, the at least one amino acid residue change in the Fc domain is: a) N297A, N297G, N297Q, N297D as in Eu index of Kabat numbering and relative to SEQ ID NO: 898; or b) K322A/L234A/L235A N296A as in the EU index of Kabat numbering and relative to SEQ ID NO: 898; or c) L234F/L235E/P331S N296A as in the EU index of Kabat numbering and relative to SEQ ID NO: 898; or d) P329G/L234A/L235A as in the EU index of Kabat numbering and relative to SEQ ID NO: 898.

[0013] Also provided is a pharmaceutical composition comprising a conjugate as described herein along with a pharmaceutically acceptable excipient. In the pharmaceutical composition, the average ratio of proteolysis targeting modules to antibody construct in the conjugate can be from 2 to 6, from 3 to 5 or 1 to 3. The pharmaceutical composition can be lyophilized.

[0014] Also provided are methods of treating cancer comprising administering a conjugate as described herein, or a pharmaceutical composition of a conjugate as described herein, to a subject in need thereof. In some embodiments, the cancer is a solid tumor, such as breast cancer, pancreatic cancer, colorectal cancer, renal cell cancer, gastric cancer, or lung cancer. In some embodiments, the pharmaceutical composition is administered parenterally. In some embodiments, the pharmaceutical composition is administered intravenously.

[0015] In certain aspects, the disclosure also provides immune-stimulatory conjugates comprising: (a) an immune-stimulatory compound that binds to a target protein to stimulate an immune response by stimulating the activity of the target protein, reducing immune inhibition by the target protein or increasing degradation of the target protein; (b) an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to at least a first antigen and wherein the Fc domain binds to an Fc receptor; and (c) a linker, wherein the linker is covalently bound to the antibody construct and the linker is covalently bound to the immune-stimulatory compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is equal to, or up to no greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of the immune-stimulatory compound of the conjugate (i.e, attached to the conjugate) to the target protein is equal to, or up to no greater than 100 times the K_d for binding of a control compound to the target protein active site or wherein the EC_{50} or IC_{50} of the immune-stimulatory compound of the conjugate is no greater than 300-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory

compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of the immune-stimulatory compound of the conjugate (i.e, attached to the conjugate) to the target protein is equal to, or up to no greater than 100 times the K_d for binding of a control compound to the target protein active site or wherein the EC_{50} or IC_{50} of the immune-stimulatory compound of the conjugate is no greater than 300-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. In some embodiments, the Fc domain is an Fc null.

[0016] In certain embodiments, the disclosure provides an immune-stimulatory conjugate comprising: (a) an immune-stimulatory compound that binds to a protein active site to stimulate an immune response; (b) an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to at least a first antigen and wherein the Fc domain binds to an Fc receptor; and (c) a linker, wherein the linker is covalently bound to the antibody construct and the linker is covalently bound to the immune-stimulatory compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is equal to, or up to no greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of immune-stimulatory compound of the conjugate to the protein active site is equal to, or up to no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the EC_{50} or IC_{50} of the immune-stimulatory compound of the conjugate (attached to the conjugate)is no greater than 300-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound.

[0017] In certain embodiments, the disclosure provides an immune-stimulatory conjugate comprising: (a) an immune-stimulatory compound that binds to a protein active site of a binding protein to stimulate an immune response by inhibition of the activity of the binding protein; (b)

an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to at least a first antigen and wherein the Fc domain binds to an Fc receptor; and (c) a linker, wherein the linker is covalently bound to the antibody construct and the linker is covalently bound to the immune-stimulatory compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is equal to, or up to no greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of the immune-stimulatory compound of the conjugate (attached to the conjugate) to the protein active site is equal to, or up to no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the IC_{50} of the immune-stimulatory compound of the conjugate (attached to the conjugate) is no greater than 300-fold the IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of the immune-stimulatory compound of the conjugate (attached to the conjugate) to the protein active site is equal to, or up to no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the IC_{50} of the immune-stimulatory compound of the conjugate (attached to the conjugate) is no greater than 300-fold the IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. In some embodiments, the Fc domain is an Fc null.

[0018] In certain embodiments, the disclosure provides an immune-stimulatory conjugate comprising: (a) an immune-stimulatory compound that binds to a protein active site of a binding protein to stimulate an immune response by increasing degradation of the binding protein; (b) an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to at least a first antigen and wherein the Fc domain binds to an Fc receptor; and (c) a linker, wherein the linker is covalently bound to the antibody construct and the linker is covalently bound to the immune-stimulatory compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is equal to, or up to no greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of the immune-stimulatory compound of the conjugate (attached to the conjugate) to the protein active site is equal to, or up to no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the IC_{50} of the

immune-stimulatory compound of the conjugate is no greater than 300-fold the IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of the immune-stimulatory compound of the conjugate (attached to the conjugate) to the protein active site is equal to, or up to no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the IC_{50} of the immune-stimulatory compound of the conjugate is no greater than 300-fold the IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. In some embodiments, the Fc domain is an Fc null.

[0019] In certain embodiments, the EC_{50} or IC_{50} of the immune-stimulatory compound of the conjugate is no greater than 100-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. The EC_{50} or IC_{50} of the immune-stimulatory compound of the conjugate may be no greater than 10-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. The EC_{50} or IC_{50} of the immune-stimulatory compound of the conjugate may be equivalent to or less than the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound.

[0020] In certain embodiments, the EC_{50} or IC_{50} of the immune stimulatory compound on an antigen bearing cell is equivalent to or less than the EC_{50} or IC_{50} of a control compound on the antigen bearing cell and the EC_{50} or IC_{50} of the immune-stimulatory conjugate is 5-fold greater or more than the EC_{50} or IC_{50} of the control compound for a non-antigen bearing cell.

[0021] The immune-stimulatory compound of the conjugate may have a K_d for binding to the protein active site of no greater than 50 times the K_d for binding of a control compound to the protein active site, wherein the control compound is the unbound immune-stimulatory compound. The immune-stimulatory compound of the conjugate may have a K_d for binding to the protein active site of no greater than 10 times the K_d for binding of a control compound to the protein active site, wherein the control compound is the unbound immune-stimulatory compound. The immune-stimulatory compound of the conjugate may have a K_d for binding to the protein active site of equivalent to or less than the K_d for binding of a control compound to the protein active site, wherein the control compound is the unbound immune-stimulatory compound.

[0022] In certain aspects, the disclosure provides an immune-stimulatory conjugate comprising: (a) an immune-stimulatory compound that binds to a protein active site to stimulate an immune

response; (b) an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to a first antigen and wherein the Fc domain binds to an Fc receptor; and (c) a linker comprising 5-100 consecutive atoms attachment sites, wherein one attachment site of the linker is covalently bound to the antibody construct and another attachment site of the linker is covalently bound to the immune-stimulatory compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is equal to, or up to no greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of the immune-stimulatory compound when bound to a the linker to the protein active site is no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the EC_{50} or IC_{50} of the immune-stimulatory compound of the conjugate is no greater than 300-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. In some embodiments, the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct; and wherein the K_d for binding of the immune-stimulatory compound when bound to a the linker to the protein active site is no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the EC_{50} or IC_{50} of the immune-stimulatory compound of the conjugate is no greater than 300-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. In some embodiments, the Fc domain is an Fc null.

[0023] In certain embodiments, the EC_{50} or IC_{50} of the immune-stimulatory compound when bound to the 5-100 atom linker is no greater than 100-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. In certain embodiments, the EC_{50} or IC_{50} of the immune-stimulatory compound when bound to the 5-100 atom linker is no greater than 10-fold the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound. The EC_{50} or IC_{50} of the immune-stimulatory compound when bound to the 5-100 atom linker may be equivalent to or less than the EC_{50} or IC_{50} of a control compound, wherein the control compound is the unbound immune-stimulatory compound.

[0024] In certain embodiments, the K_d for binding of the immune-stimulatory compound when bound to the 5-100 atom linker to the protein active site may be no greater than 50 times the K_d for binding of a control compound to the protein active site, wherein the control compound is the unbound immune-stimulatory compound. The K_d for binding of the of the immune-stimulatory

compound when bound to a 5-100 atom linker to the protein active site may be no greater than 10 times the K_d for binding of a control compound to the protein active site, wherein the control compound is the unbound immune-stimulatory compound. The K_d for binding of the immune-stimulatory compound when bound to a 5-100 atom linker to the protein active site may be equivalent to or less than the K_d for binding of a control compound to the protein active site wherein the control compound is the unbound immune-stimulatory compound.

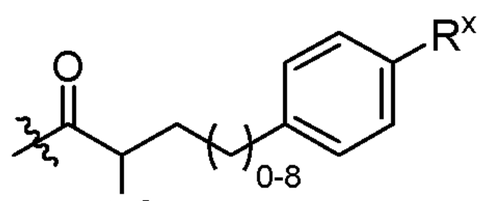
[0025] In certain embodiments, the immune-stimulatory conjugate described herein comprises moiety that binds to the binding protein and an E3 ubiquitin ligase binding moiety. The E3 ubiquitin ligase binding moiety may bind to, for example, VHL, cereblon or MDM2. The E3 ubiquitin ligase binding moiety may be selected from among E3 targeting compounds. The E3 ubiquitin ligase binding moiety may be attached to the linker or may be part of the linker. In certain embodiments, the E3 ubiquitin ligase binding moiety attached to the linker, wherein the E3 ubiquitin ligase binding moiety is bound through a first linker having 5-100 consecutive atoms between attachment sites to the immune-stimulatory compound and the E3 ubiquitin ligase binding moiety is bound through a second linker having 5-100 consecutive atoms between attachment points to the antibody construct.

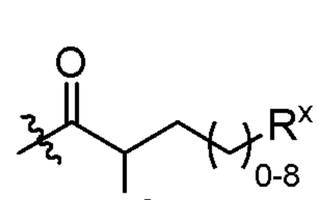
[0026] In certain embodiments, the immune-stimulatory compound is a kinase inhibitor and the protein active site is a kinase active site. In certain embodiments, the linker is covalently bound to the kinase inhibitor at a position on the kinase inhibitor that is at or near the solvent interface of the kinase active site as determined by modeling of the kinase inhibitor in the kinase active site. In certain embodiments, the linker is covalently bound to the kinase inhibitor at a position on the kinase inhibitor such that when the kinase inhibitor is bound to the active site, the linker extends out from the kinase active site into the solvent, as determined by modeling of the kinase inhibitor in the kinase active site. In certain embodiments, the kinase inhibitor may be selected from an inhibitor of ALK, Bcr-Abl, BRAF, BTK, c-KIT, EGFR, ErbB2, JAK, MEK, MET, PDGFRB, RET, ROS1, Syk, SRC, TGFβR2, TNIK, TNKS, TNKS2, TrkA, TrkB, TrkC, VEGF, VEGFR1, VEGFR2, VEGFR3, FGFR1, FGFR2, FGFR3, FGFR4, CSF1R, RON/MST1R, TYRO3, MERTK, AXL, PI3Kdelta PI3Kgamma, MAP4K1, PERK, and combinations thereof.

[0027] In certain embodiments, the immune-stimulatory compound is selected from a toll-like receptor agonist, STING agonist, or RIG-I agonist. The immune-stimulatory compound may be a toll-like receptor (TLR) agonist selected from a TLR1 agonist, a TLR2 agonist, a TLR3 agonist, a TLR4 agonist, a TLR5 agonist, a TLR6 agonist, a TLR7 agonist, a TLR8 agonist, a TLR9 agonist, or a TLR10 agonist. The immune-stimulatory compound may be selected from a pyrimidine, a purine, a guanine nucleoside, an 8-oxoadenine, an imidazoquinoline, a thiazoquinoline, a 2-aminoimidazole, a furo[2,3-c]pyridine, a furo[2,3-c]quinoline, a 2-

aminobenzimidazole, a 2-aminoquinoline, and a 2-aminobenzazepine. The immune-stimulatory compound may bind to a G protein-coupled receptor (GCPR), an ion channel, a membrane transporter, a phosphatase or an endoplasmic reticulum (ER) protein.

[0028] In certain embodiments, the immune-stimulatory compound is an antagonist of the GPCR A2aR, the sphingosine 1-phosphate receptor 1, prostaglandin receptor EP3, prostanglandin receptor E2, Frizzled, CXCR4 or an LPA receptor. The immune-stimulatory compound may be an ion channel agonist for CRAC, Kv1.3 or KCa3.1. The immune-stimulatory compound may be an inhibitor of HSP90 or AAA-ATPase p97.

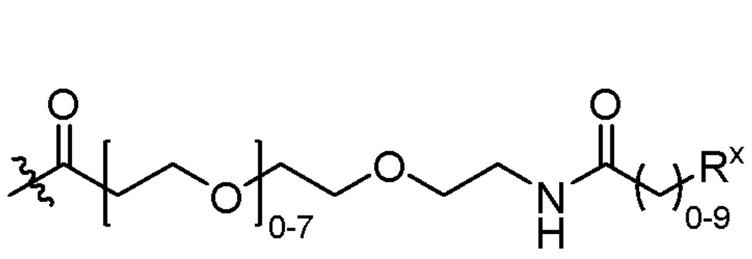
[0029] In certain embodiments, the immune-stimulatory conjugate has immune-stimulatory activity while attached to the conjugate or the linker and without undergoing cell processing such as by endosomal or lysosomal degradation, e.g., to release the immune-stimulatory compound or a modified form of the compound from the conjugate or linker. In certain embodiments, the linker is a non-cleavable linker. The linker may be selected from the group consisting of Fleximer linkers. The linker may comprise one or more carbamate or amide linkages when attached to an immune-stimulatory compound. The linker may be selected from a linker is represented by one of the following formula: 

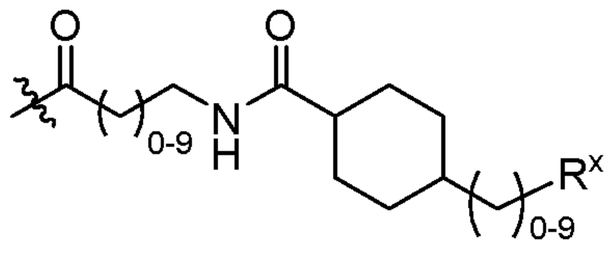


,

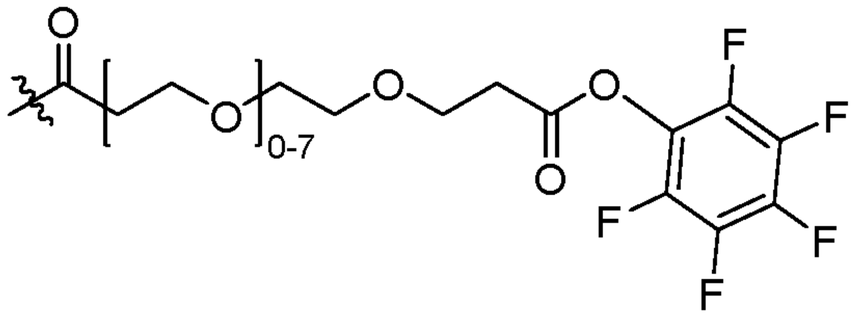
,

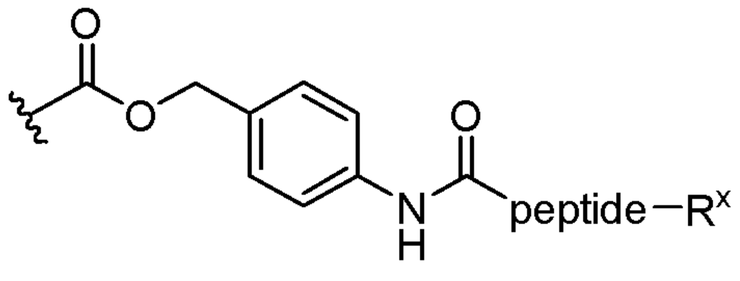
,



,


,



, or 

, wherein R^x is a reactive moiety and wherein R^a is selected from the group consisting of hydrogen, alkyl (e.g., C_1-C_8 alkyl), sulfonate and methyl sulfonate. The linker may be attached to the antibody construct at a cysteine or lysine residue of the antibody construct.

[0030] In certain embodiments, the first antigen is a tumor antigen. The first antigen may be at least 80% or 100% homologous to CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast

activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6 E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, , TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, PD-L1, VTCN1 (B7-H4), VISTA, gpNMB, or any fragment thereof.

[0031] In certain embodiments, the antibody construct further comprises a second target binding domain. In certain embodiments, the target binding domain specifically binds an antigen on an immune cell. The target binding domain may be attached (e.g., conjugated or linked) to the antibody construct at a C-terminal end of the Fc domain. The antigen binding domain may be from an antibody or non-antibody scaffold. The antigen binding domain may be at least 97% homologous to an antigen binding domain from an antibody or non-antibody scaffold. The antibody construct may be a human antibody or a humanized antibody. The Fc domain may be an Fc domain variant comprising at least one amino acid residue change as compared to a wild type sequence of the Fc domain. The Fc domain may be at least about 80% homologous to an Fc domain from an antibody, wherein the Fc domain from an antibody comprises amino acid residues 216 to 447 of an IgG1 (within SEQ ID NO: 898), amino acid residues 216 to 443 of an IgG2 (within SEQ ID NO: 899), or amino acid residues 216 to 444 of an IgG4 (within SEQ ID NO: 900).

[0032] In certain embodiments, the Fc domain may have at least one amino acid residue change as compared to a wildtype Fc domain. In certain embodiments, the Fc domain may have at least one amino acid residue change as compared to a wildtype Fc domain, wherein the Fc domain is at least 80% homologous to SEQ ID NO: 898. The at least one amino acid residue change may be in an IgG Fc domain: a) F243L, R292P, Y300L, L235V, and P396L, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO:898; b) S239D and I332E, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898; or c) S298A, E333A, and K334A, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 296. The Fc domain may have at least one amino acid residue change as

compared to wildtype, wherein the Fc domain is at comprises at least 80% homologous to SEQ ID NO: 898, and wherein the at least one amino acid residue change is: (a) N296A wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898; or (b) N296G N296A wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898; or (c) K322A/L234A/L235A N296A wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898; or (d) L234F/L235E/P331S N296A wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898.

[0033] In certain embodiments, the K_d for binding of the antigen binding domain to the first antigen in the presence of the immune-stimulatory compound is less than about 100 nM and is equal to, or up to no greater than about 10 times the K_d of the binding of the antigen binding domain to the first antigen in the absence of the immune-stimulatory compound; and the K_d for binding of the Fc domain to the Fc receptor in the presence of the immune-stimulatory compound is equal to, or up to no greater than about 10 times the K_d for the binding of the Fc domain to the Fc receptor in the absence of the immune-stimulatory compound.

[0034] In certain embodiments, the molar ratio of immune-stimulatory compound to antibody in a conjugate is less than 5. In certain embodiments, the average molar ratio of immune-stimulatory compound to antibody construct in a composition of conjugates is less than 5. In certain embodiments, the average molar ratio of immune-stimulatory compound to antibody construct in a composition of conjugates from 1 to 3, 3 to 5, or about 2.

[0035] The linker may be bound to the antibody construct at an amino acid residue that does not interfere with the Fc domain binding to the Fc receptor. The linker may not be attached to an amino acid residue of an IgG Fc domain selected from a group consisting of: 221, 224, 227, 228, 230, 231, 223, 233, 234, 235, 236, 237, 238, 239, 240, 241, 243, 244, 245, 247, 249, 250, 258, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 275, 276, 278, 280, 281, 283, 285, 286, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 302, 305, 313, 318, 323, 324, 325, 327, 328, 329, 330, 331, 332, 333, 335, 336, 396, or 428, wherein numbering of amino acid residues in the Fc domain is according to the EU index as in Kabat.

[0036] The linker is bound to the antibody construct at an amino acid of an IgG Fc domain selected from a group consisting of: 221, 224, 227, 228, 230, 231, 223, 233, 234, 235, 236, 237, 238, 239, 240, 241, 243, 244, 245, 247, 249, 250, 258, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 275, 276, 278, 280, 281, 283, 285, 286, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 302, 305, 313, 318, 323, 324, 325, 327, 328, 329, 330, 331, 332, 333, 335, 336, 396, or 428, wherein numbering of amino acid residues in the Fc domain is according to the EU index as in Kabat.

[0037] In certain embodiments, the Fc domain is an IgG Fc domain selected from a group consisting of a human IgG1 Fc domain, a human IgG2 Fc domain, a human IgG3 Fc domain, and a human IgG4 Fc domain. In certain aspects, the immune-stimulatory conjugate induces the secretion of cytokines by an antigen presenting cell.

[0038] In certain aspects, the disclosure provides a pharmaceutical composition comprising immune-stimulatory conjugates as described herein and a pharmaceutically acceptable excipient. In certain aspects, the disclosure provides a method of treating cancer, comprising administering to a subject in need thereof an immune-stimulatory conjugate described herein. In certain aspects, the disclosure provides a method of treating cancer, comprising administering to a subject in need thereof a pharmaceutical composition comprising immune-stimulatory conjugates as described herein.

BRIEF DESCRIPTION OF THE DRAWINGS

[0039] The novel features of the disclosure are set forth with particularity in the appended claims. A better understanding of the features and advantages of the present disclosure will be obtained by reference to the following detailed description that sets forth illustrative aspects, in which the principles of the disclosure are utilized, and the accompanying drawings of which:

[0040] FIGURE 1 illustrates a schematic of a conjugate comprising an antibody and a second binding domain. The antibody contains two heavy chains as shown in gray and two light chains as shown in light gray. A portion of the heavy chains contain Fc domains (705 and 720). The antibody comprises a binding domain comprising two antigen binding sites (710 and 715). The second binding domain is attached to the antibody (780 and 785), for example, at the C-terminus of the heavy chains.

[0041] FIGURE 2 illustrates a schematic of an exemplary conjugate. The conjugate comprises an antibody, which contains two heavy chains as shown in gray and two light chains as shown in light gray. The antibody comprises a binding domain comprising two antigen binding sites (910 and 915), and a portion of the heavy chains contain Fc domains (905 and 920). The immune-stimulatory compounds (930 and 940) are attached to the antibody by linkers (960 and 970). A second binding domain is attached to the antibody (980 and 985), for example, at the C-terminus of the heavy chains.

[0042] FIGURE 3 illustrates a schematic of an exemplary conjugate. The conjugate comprises the Fc region of an antibody with the heavy chains shown in gray, and two scaffolds as shown in light gray. The conjugate comprises a first binding domain comprising two antigen binding sites (1110 and 1115) in the scaffolds, and a portion of the heavy chains contain Fc domains (1105 and 1120). The immune-stimulatory compounds (1130 and 1140) are conjugated to the Fc domains

by linkers (1160 and 1170). A second binding domain is attached to the conjugate (1180 and 1185), for example, at the C-terminus of the heavy chains.

[0043] FIGURE 4 illustrates a schematic of an exemplary conjugate. The conjugate comprises the $F(ab')_2$ region of an antibody with the Fab portions of heavy chains shown in gray and light chains shown in light gray, and two scaffolds as shown in dark gray. The conjugate comprises a first binding domain comprising two antigen binding sites (1310 and 1315), and a portion of two scaffolds contain Fc domains (1340 and 1345). The immune-stimulatory compounds (1330 and 1340) are attached to the conjugate by linkers (1360 and 1370). A second binding domain is attached to the Fc domains (1380 and 1385).

[0044] FIGURE 5 illustrates a schematic of an exemplary conjugate. The conjugate contains two scaffolds as shown in light gray and two scaffolds as shown in dark gray. The conjugate comprises a first binding domain comprising two antigen binding sites (1510 and 1515), and a portion of the two dark gray scaffolds contain Fc domains (1540 and 1545). The immune-stimulatory compounds (1530 and 1540) are conjugated to the conjugate by linkers (1560 and 1570). A second binding domain is attached to the conjugate (1580 and 1585).

[0045] FIGURE 6 illustrates a schematic of a conjugate comprising an antibody and a second binding domain. The antibody contains two heavy chains as shown in gray and two light chains as shown in light gray. A portion of the heavy chains contain Fc domains (1705 and 1720). The antibody comprises a binding domain comprising two antigen binding sites (1710 and 1715). The second binding domain is attached to the antibody (1780 and 1785), for example, at the C-terminus of the light chains.

[0046] FIGURE 7 illustrates a schematic of an exemplary conjugate. The conjugate comprises an antibody, which contains two heavy chains as shown in gray and two light chains as shown in light gray. The antibody comprises a binding domain comprising two antigen binding sites (1910 and 1915), and a portion of the heavy chains contain Fc domains (1905 and 1920). The immune-stimulatory compounds (1930 and 1940) are conjugated to the antibody by linkers (1960 and 1970). A second binding domain is attached to the antibody (1980 and 1985), for example, at the C-terminus of the light chains.

[0047] FIGURE 8 illustrates a schematic of an exemplary conjugate. The conjugate comprises an Fc region of an antibody shown in gray, and two scaffolds as shown in light gray. The conjugate comprises a first binding domain comprising two antigen binding sites (2110 and 2115) in the scaffolds, and a portion containing Fc domains (2105 and 2120). The immune-stimulatory compounds (2130 and 2140) are conjugated to the antibody construct by linkers (2160 and 2170). A second binding domain is attached to the antibody (2180 and 2185).

[0048] FIGURE 9 illustrates a schematic of an exemplary conjugate. The conjugate comprises the F(ab')2 region of an antibody with heavy chains shown in gray and light chains shown in light gray, and two scaffolds as shown in dark gray. The conjugate comprises a first binding domain comprising two antigen binding sites (2310 and 2315), and a portion of two scaffolds contain Fc domains (2340 and 2345). The immune-stimulatory compounds (2330 and 2340) are conjugated to the antibody by linkers (2360 and 2370). A second binding domain is attached to the antibody (2380 and 2385), for example, at the C-terminus of the light chains.

[0049] FIGURE 10 illustrates a schematic of an exemplary conjugate. The conjugate contains two scaffolds as shown in light gray and two scaffolds as shown in dark gray. The conjugate comprises a first binding domain comprising two antigen binding sites (2510 and 2515), and a portion of the two dark gray scaffolds contain Fc domains (2540 and 2545). The immune-stimulatory compounds (2530 and 2540) are conjugated to the antibody construct by linkers (2560 and 2570). A second binding domain is attached to the conjugate (2580 and 2585).

[0050] FIGURE 11 illustrates a schematic of an antibody construct comprising an antibody. The antibody contains two heavy chains and two light chains. A portion of the heavy chains contain Fc domains (2705 and 2720). The antibody comprises a binding domain comprising two antigen binding sites shown in black (2710 and 2715).

[0051] FIGURE 12 illustrates a schematic of an antibody construct comprising an antibody. The antibody contains two heavy chains and two light chains. A portion of the heavy chains contain Fc domains (2925 and 2930). The antibody comprises a first binding domain comprising two antigen binding sites shown in black (2910 and 2915). The antibody comprises a second binding domain comprising two single chain variable fragments (2905 and 2920) attached to a C-terminus of the light chains. A single chain variable fragment can be attached to a light chain chain at a heavy chain variable domain of the single chain variable fragment. A single chain variable fragment can be attached to a light chain at a light chain variable domain of the single chain variable fragment.

[0052] FIGURE 13 illustrates a schematic of an antibody construct comprising an antibody. The antibody contains two heavy chains and two light chains. A portion of the heavy chains contain Fc domains (3120 and 3125). The antibody comprises a first binding domain comprising two antigen binding sites shown in black (3110 and 3115). The antibody comprises a second binding domain comprising two single chain variable fragments (3130 and 3135) attached to a C-terminus of the heavy chains. A single chain variable fragment can be attached to a heavy chain chain at a heavy chain variable domain of the single chain variable fragment. A single chain variable fragment can be attached to a heavy chain at a light chain variable domain of the single chain variable fragment.

[0053] FIGURE 14 illustrates a schematic of an antibody construct comprising an antibody. The antibody contains two heavy chains and two light chains. A portion of the heavy chains contain Fc domains (3330 and 3335). The antibody comprises a first binding domain comprising two antigen binding sites shown in black (3310 and 3315). The antibody comprises a second binding domain comprising two single chain variable fragments (3320 and 3325) attached to a C-terminus of the light chains. A single chain variable fragment can be attached to a light chain chain at a heavy chain variable domain of the single chain variable fragment. A single chain variable fragment can be attached to a light chain at a light chain variable domain of the single chain variable fragment. The antibody comprises a third binding domain comprising two single chain variable fragments (3340 and 3345) attached to a C-terminus of the heavy chains. A single chain variable fragment can be attached to a heavy chain chain at a heavy chain variable domain of the single chain variable fragment. A single chain variable fragment can be attached to a heavy chain at a light chain variable domain of the single chain variable fragment.

[0054] FIGURE 15A sets forth a structure of an immune-stimulatory compound (left) and an immune-stimulatory compound with an amine handle (right top).

[0055] FIGURE 15B shows the x-ray crystal structure and binding orientation (pdb code 5D7A) of the immune-stimulatory compound as described in FIGURE 15A in a TNIK (TRAF2 and NCK-interacting protein kinase) active site. Specific interactions between the inhibitor and the TNIK active site are described in Masuda et al., *TNIK inhibition abrogates colorectal cancer stemness,* (2016) Nat Commun 7: 12586-12586.

[0056] FIGURE 15C shows a close up of the binding orientation of the immune-stimulatory compound as described in FIGURE 15A in a TNIK active site, where the linker and antibody portions are pointing away and sitting outside of the active site.

[0057] FIGURE 16 sets forth a structure of an immune-stimulatory compound (left) and an immune-stimulatory compound with an amine handle and linker surrogate (right). The structure on the right illustrates that the immune-stimulatory compound is predicted to sit in the enzyme active site, whereas the amine handle and linker surrogate are predicted to sit outside of the enzyme active site, in the solvent.

[0058] FIGURE 17A sets forth a structure of an immune-stimulatory compound (left) and an immune-stimulatory compound with a linker surrogate (left side of molecule on right).

[0059] FIGURE 17B shows the x-ray crystal structure and binding orientation (pdb code 5E91) of the immune-stimulatory compound as described in FIGURE 17A in a TGFβR2 (transforming growth factor, beta receptor II) active site. Specific interactions between the inhibitor and the TGFβRII active site are described in Tebben et al., *Crystal structures of apo and inhibitor-bound*

TGFbetaR2 kinase domain: insights into TGFbetaR isoform selectivity, (2016) Acta Crystallogr., Sect.D 72: 658-674.

[0060] FIGURE 17C shows a close up of the binding orientation of the immune-stimulatory compound as described in FIGURE 17A in a TGFβR2 active site, where the linker and antibody construct portions are pointing away and sitting outside of the active site.

[0061] FIGURE 18A sets forth a structure of an immune-stimulatory compound (left) and an immune-stimulatory compound with an amine handle (upper left in molecule on right).

[0062] FIGURE 18B shows the x-ray crystal structure and binding orientation (pdb code 3KR8) of the immune-stimulatory compound as described in FIGURE 18A in a TNKS (tankyrase) active site.

[0063] FIGURE 18C shows a close up of the binding orientation of the immune-stimulatory compound as described in FIGURE 18A in a TNKS active site, where the linker and antibody construct portions are pointing away and sitting outside of the active site. Specific interactions between the inhibitor and the human tankyrase 2 - catalytic PARP domain active site are described in Karlberg et al., *Structural basis for the interaction between tankyrase-2 and a potent Wnt-signaling inhibitor*, (2010) J.Med.Chem. 53: 5352-5355.

[0064] FIGURE 19A shows a structure of an immune-stimulatory compound (left) and an immune-stimulatory compound with two amine handles (on right side of molecule on the right).

[0065] FIGURE 19B shows the x-ray crystal structure and binding orientation (pdb code 4I9I) of the immune-stimulatory compound as described in FIGURE 19A with dual site binding in the TNKS (tankyrase) active site. Specific interactions between the inhibitor and human tankyrase 1 are described in Bregman et al, *Discovery of a class of novel tankyrase inhibitors that bind to both the nicotinamide pocket and the induced pocket*, (2013) J.Med.Chem. 56: 1341-1345.

[0066] FIGURE 19C shows a close up of the binding orientation of the immune-stimulatory compound as described in FIGURE 19A in a TNKS active site, where the linker and antibody portions are pointing away and sitting outside of the active site.

[0067] FIGURE 20A illustrates a schematic of an exemplary conjugate and its molecular target. The conjugate comprises an antibody (3405) attached to a linker (3410) that is attached to a drug (3415) at the opposite end of the antibody (3405). The molecular target (3420) has an active site (3425) that is complementary to the drug (3415).

[0068] FIGURE 20B illustrates a schematic of an active exemplary conjugate that is bound to the the molecular target's active site. The drug (3415) sits within the active site of the molecular target (3420). The linker (3410) and antibody (3405) sit outside of the active site (3430).

[0069] FIGURE 20C illustrates a schematic of an active drug (3415) and linker (3410) that is bound to the molecular target (3420).

[0070] FIGURE 20D illustrates a schematic of an active drug (3415) that is bound to the molecular target (3420).

[0071] FIGURE 21A, **FIGURE 21B**, and **FIGURE 21C** show the results of an assay for degradation of TFGβR2 by a TGFβR2-VHL PROTAC anti-HER2 antibody conjugate.

[0072] FIGURE 22A and **FIGURE 22B** show the results of an assay for antigen targeted degradation of TGFβR2 by an antibody conjugate with a PROTAC having VHL or Cereblon E3 binding moieties.

[0073] FIGURE 23A and **FIGURE 23B** show the results of an assay for cellular levels of TGFβR2 and TGFβR1 in the presence of a TGFβR2/TGFβR1-VHL PROTAC with or without the addition of a proteasome inhibitor.

DETAILED DESCRIPTION

[0074] Additional aspects and advantages of the present disclosure will become apparent to those skilled in this art from the following detailed description, wherein illustrative aspects of the present disclosure are shown and described. As will be realized, the present disclosure is capable of other and different aspects, and its several details are capable of modifications in various respects, all without departing from the disclosure. Accordingly, the drawings and description are to be regarded as illustrative in nature, and not as restrictive.

[0075] As used herein, "potency" generally refers to measured bioactivity and may be quantified as an EC50 or IC50. Potency refers to the amount of a compound or conjugate needed to give an effect. For example, the potency of an immune-stimulatory compound which requires a lower amount of the immune-stimulatory compound compared with a different immune-stimulatory compound can be considered to have greater potency. Furthermore, the different immune-stimulatory compound requires a greater amount of the different immune-stimulatory compound to generate a response, and can therefore be considered lower potency. Potencies of bioactive compounds or conjugates may be measured over a concentration range and can be reported as those molar concentrations required to elicit or inhibit a percentage of the measured bioresponse. For example, a concentration required to stimulate 50% of observed maximal activity in the assay may be reported as an effective concentration 50 (EC50), to stimulate 90% activity as an EC90, or to stimulate 10% activity as an EC10. For example, a concentration of an antagonist required to give 50% maximal inhibition of a biological activity may be reported as an inhibitory concentration 50 (IC50), to inhibit 90% as an IC90, or to inhibit 10% as an IC10. This may allow for a comparison of the potencies of bioactive compounds on a molar basis by comparison of their EC or IC values for a given bioassay. For example, an immune-stimulatory conjugate or an immune-stimulatory compound with an EC50 or IC50 that is greater than 300 times the EC50 or

IC50 of a control requires 300-fold higher, or more than 300-fold higher, concentration compared to the control to achieve a 50% bioresponse and has a potency weaker than the control by at least 300-fold. Therefore, an immune-stimulatory compound or conjugate that has an EC50 or IC50 not greater than about 300 times the EC50 or IC50 of a control compound may require no more than a 300-fold higher concentration than the control compound to achieve a 50% maximal bioresponse, no greater than 100 times the EC50 or IC50 requires no more than 100-fold higher concentration and no greater than 10 times the EC50 or IC50 requires no more than 10 times the concentration of the control. The potency of the immune-stimulatory compound or conjugate may be within 300-fold or better, 100-fold or better, or 10-fold or better the potency of the control.

[0076] As used herein, "control compound" refers to, in a case of an immune-stimulatory compound, the compound before attachment to a linker and antibody construct; in the case of an antibody construct, the construct before attachment of the linker and immune-stimulatory compound; or, in the case of a conjugate including an E3 ubiquitin ligase binding moiety, control compound refers to the immune-stimulatory compound attached to a linker that is attached to an E3 ubiquitin ligase binding moiety.

[0077] An "immune-stimulatory compound" as described herein, also referred to herein as an immune-stimulatory agent or molecule, refers to a molecule that stimulates the immune system by inducing activation or increasing activity of any of its components. For example, an immune stimulatory compound may bind directly to a component of the immune system and activate or increase an activity of the immune system or a component thereof. An immune stimulatory compound may also bind to an inhibitory component of the immune system and inactivate or decrease the activity of that component, thereby increasing an activity of the immune system. Immune-stimulatory compounds may have or cause antigenic specificity. In certain embodiments, an immune-stimulatory compound activates macrophages. In certain embodiments, an immune-stimulatory compound induces the secretion of cytokines by an antigen presenting cell. The increased activity or activation of the immune system may be evaluated using methods known in the field for evaluating an immune response (see, for example, J. Gratama, Cytometry A. 2008 Nov: 73(11): 971-4, the contents of which are incorporated herein in its entirety).

[0078] A "protein active site" as described herein, refers to a region of a protein target where a molecule (such as a substrate molecule or allosteric effector) binds to the target protein. The molecule may trigger a response upon binding to the the binding protein, e.g., inhibition of the activity of the binding protein or degradation of the binding protein. The protein active site includes the residues that interact with, e.g., bind covalently or non-covalently, a molecule such as an immune-stimulatory compound or a portion thereof. The protein active site may define a

groove or pocket in the target protein wherein the interface between the groove or pocket and surrounding solvent is the solvent/active site interface of the protein active site.

[0079] The phrase "stimulate an immune response" refers to stimulating a response from immune cells that increases the activity or responsiveness of the immune system or a part thereof, such as, for example, inducing secretion of cytokines and/or chemokines, activating immune cells, e.g., T cells, B cells, macrophages, dendritic cells, etc., enhancing antigen presenting cell presentation of antigen, inducing antibody-dependent cell-mediated phagocytosis (ADCP), inducing antibody-dependent cell-mediated cytotoxicity (ADCC), NK cell or CD8+ T cell cytolytic activity, and/or blocking immune suppression.

[0080] As used herein, "homologous" or "homology" refer to the similarity or identity between a DNA, RNA, nucleotide, amino acid, or protein sequence to another DNA, RNA, nucleotide, amino acid, or protein sequence, respectively. Homology can be expressed in terms of a percentage of sequence identity of a first sequence to a second sequence. Percent (%) sequence identity with respect to a reference DNA sequence is the percentage of DNA nucleotides in a candidate sequence that are identical with the DNA nucleotides in the reference DNA sequence after aligning the sequences and introducing gaps, as necessary. Percent (%) sequence identity with respect to a reference amino acid sequence is the percentage of amino acid residues in a candidate sequence that are identical with the amino acid residues in the reference amino acid sequence after aligning the sequences and introducing gaps, if necessary, to achieve the maximum percent sequence identity, and not considering any conservative substitutions as part of the sequence identity.

[0081] As used herein, the abbreviations for the natural l-enantiomeric amino acids are conventional and can be as follows: alanine (A, Ala); arginine (R, Arg); asparagine (N, Asn); aspartic acid (D, Asp); cysteine (C, Cys); glutamic acid (E, Glu); glutamine (Q, Gln); glycine (G, Gly); histidine (H, His); isoleucine (I, Ile); leucine (L, Leu); lysine (K, Lys); methionine (M, Met); phenylalanine (F, Phe); proline (P, Pro); serine (S, Ser); threonine (T, Thr); tryptophan (W, Trp); tyrosine (Y, Tyr); valine (V, Val). Unless otherwise specified, X can indicate any amino acid. In some aspects, X can be asparagine (N), glutamine (Q), histidine (H), lysine (K), or arginine (R).

[0082] As used herein, the term "antibody" refers to an immunoglobulin molecule that specifically binds to, or is immunologically reactive toward, a specific antigen. The term antibody can include, for example, polyclonal, monoclonal, genetically engineered, and antigen binding fragments thereof. An antibody can be, for example, murine, chimeric, humanized, bispecific, a heteroconjugate, a diabody, a triabody, a tetrabody or a hcAb (heavy chain antibody). An antigen binding fragment can include, for example, a Fab', $F(ab')_2$, Fab, Fv, rIgG, scFv, a single domain antibody, V_{HH}, V_{NAR}, sdAb, or nanobody.

[0083] As used herein, the term "antigen" refers to a molecule that can be bound by an antibody or a antibody construct. An antigen may elicit an immune response. An antigen can be a protein, polysaccharide, lipid, glycolipid or the like, which can be recognized by an antibody or an immune cell, such as a T cell or a B cell. Exposure of immune cells to one or more of these antigens can elicit a rapid cell division and differentiation response resulting in the formation of clones of the exposed T cells and B cells. B cells can differentiate into plasma cells which in turn can produce antibodies which selectively bind to the antigens.

[0084] As used herein, the terms "recognize," "bind," and "specifically bind" refer to the specific association or specific binding between an antigen binding domain and a corresponding antigen, or an immune stimulatory compound and a protein, as compared to the non-specific association or non-specific binding of the antigen binding domain or immune-stimulatory compound with a non-target antigen or protein.

[0085] As used herein, a "tumor antigen" is an antigen that can be expressed by or is present on, a cancer cell, a neoplastic tumor cell and/or within a tumor microenvironment.

[0086] As used herein, an "antibody construct" refers to a construct that contains an antigen binding domain and an Fc domain.

[0087] As used herein, an "antigen binding domain" refers to an antigen binding domain from an antibody or from a non-antibody that can specifically bind to the antigen. Antigen binding domains can be numbered when there is more than one antigen binding domain in a given conjugate or construct (e.g., first binding domain, second antigen binding domain, third antigen binding domain, etc.). Different antigen binding domains in the same conjugate or construct can target the same antigen or different antigens (e.g., first binding domain that can bind a tumor antigen, second antigen binding domain that can bind to a tumor antigen or an antigen presenting cell (APC) antigen, and third antigen binding domain that can bind an APC antigen).

[0088] As used herein, a "Fc domain" is an Fc domain from an antibody or from a non-antibody that can bind to an Fc receptor.

[0089] As used herein, an "Fc null" refers to an Fc domain that exhibits weak to no binding to any of the Fcgamma receptors. In some embodiments, an Fc null domain or region exhibits a reduction in binding affinity (e.g., increase in Kd) to Fc gamma receptors of at least 1000-fold.

[0090] As used herein, a "target binding domain" refers to a construct that contains an antigen binding domain from an antibody or from a non-antibody that can bind to the antigen.

[0091] The term "salt" or "pharmaceutically acceptable salt" refers to salts derived from a variety of organic and inorganic counter ions well known in the art. Pharmaceutically acceptable acid addition salts can be formed with inorganic acids and organic acids. Inorganic acids from which salts can be derived include, for example, hydrochloric acid, hydrobromic acid, sulfuric

acid, nitric acid, phosphoric acid, and the like. Organic acids from which salts can be derived include, for example, acetic acid, propionic acid, glycolic acid, pyruvic acid, oxalic acid, maleic acid, malonic acid, succinic acid, fumaric acid, tartaric acid, citric acid, benzoic acid, cinnamic acid, mandelic acid, methanesulfonic acid, ethanesulfonic acid, *p*-toluenesulfonic acid, salicylic acid, and the like. Pharmaceutically acceptable base addition salts can be formed with inorganic and organic bases. Inorganic bases from which salts can be derived include, for example, sodium, potassium, lithium, ammonium, calcium, magnesium, iron, zinc, copper, manganese, aluminum, and the like. Organic bases from which salts can be derived include, for example, primary, secondary, and tertiary amines, substituted amines including naturally occurring substituted amines, cyclic amines, basic ion exchange resins, and the like, specifically such as isopropylamine, trimethylamine, diethylamine, triethylamine, tripropylamine, and ethanolamine. In some embodiments, the pharmaceutically acceptable base addition salt is chosen from ammonium, potassium, sodium, calcium, and magnesium salts.

[0092] As used herein, "agonism" is the binding of a chemical to a receptor to induce a biological response. A chemical can be, for example, a small molecule, a compound, or a protein. An agonist causes a response, an antagonist can block the action of an agonist, and an inverse agonist can cause a response that is opposite to that of the agonist. A receptor can be activated by either endogenous or exogenous agonists.

[0093] The term "C_{x-y}" when used in conjunction with a chemical moiety, such as alkyl, alkenyl, or alkynyl is meant to include groups that contain from x to y carbons in the chain. For example, the term "C_{x-y}alkyl" refers to substituted or unsubstituted saturated hydrocarbon groups, including straight-chain alkyl and branched-chain alkyl groups that contain from x to y carbons in the chain, including haloalkyl groups such as trifluoromethyl and 2,2,2-trifluoroethyl, etc.

[0094] The terms "C_{x-y}alkenyl" and "C_{x-y}alkynyl" refer to substituted or unsubstituted unsaturated aliphatic groups analogous in length and possible substitution to the alkyls described above, but that contain at least one double or triple bond, respectively.

[0095] The term "carbocycle" as used herein refers to a saturated, unsaturated or aromatic ring in which each atom of the ring is carbon. Carbocycle includes 3- to 10-membered monocyclic rings, 6- to 12-membered bicyclic rings, and 6- to 12-membered bridged rings. Each ring of a bicyclic carbocycle may be selected from saturated, unsaturated, and aromatic rings. In an exemplary embodiment, an aromatic ring, e.g., phenyl, may be fused to a saturated or unsaturated ring, e.g., cyclohexane, cyclopentane, or cyclohexene. Any combination of saturated, unsaturated and aromatic bicyclic rings, as valence permits, is included in the definition of carbocyclic. Exemplary carbocycles include cyclopentyl, cyclohexyl, cyclohexenyl, adamantyl, phenyl, indanyl, and naphthyl.

[0096] The term "heterocycle" as used herein refers to a saturated, unsaturated or aromatic ring comprising one or more heteroatoms. Exemplary heteroatoms include N, O, Si, P, B, and S atoms. Heterocycles include 3- to 10-membered monocyclic rings, 6- to 12-membered bicyclic rings, and 6- to 12-membered bridged rings. Each ring of a bicyclic heterocycle may be selected from saturated, unsaturated, and aromatic rings wherein at least one of the rings includes a heteroatom. In an exemplary embodiment, an aromatic ring, e.g., pyridyl, may be fused to a saturated or unsaturated ring, e.g., cyclohexane, cyclopentane, morpholine, piperidine or cyclohexene. The term "heteroaryl" includes aromatic single ring structures, preferably 5- to 7-membered rings, more preferably 5- to 6-membered rings, whose ring structures include at least one heteroatom, preferably one to four heteroatoms, more preferably one or two heteroatoms. The term "heteroaryl" also include polycyclic ring systems having two or more cyclic rings in which two or more carbons are common to two adjoining rings wherein at least one of the rings is heteroaromatic, e.g., the other cyclic rings can be aromatic or non-aromatic carbocyclic, or heterocyclic. Heteroaryl groups include, for example, pyrrole, furan, thiophene, imidazole, oxazole, thiazole, pyrazole, pyridine, pyrazine, pyridazine, and pyrimidine, and the like.

[0097] The term "substituted" refers to moieties having substituents replacing a hydrogen on one or more carbons or substitutable heteroatoms, e.g., NH, of the structure. It will be understood that "substitution" or "substituted with" includes the implicit proviso that such substitution is in accordance with permitted valence of the substituted atom and the substituent, and that the substitution results in a stable compound, *i.e.*, a compound which does not spontaneously undergo transformation such as by rearrangement, cyclization, elimination, etc. In certain embodiments, substituted refers to moieties having substituents replacing two hydrogen atoms on the same carbon atom, such as substituting the two hydrogen atoms on a single carbon with an oxo, imino or thioxo group. As used herein, the term "substituted" is contemplated to include all permissible substituents of organic compounds. In a broad aspect, the permissible substituents include acyclic and cyclic, branched and unbranched, carbocyclic and heterocyclic, aromatic and non-aromatic substituents of organic compounds. The permissible substituents can be one or more and the same or different for appropriate organic compounds. For purposes of this disclosure, the heteroatoms such as nitrogen may have hydrogen substituents and/or any permissible substituents of organic compounds described herein which satisfy the valences of the heteroatoms.

[0098] In some embodiments, substituents may include any substituents described herein, for example: halogen, hydroxy, oxo (=O), thioxo (=S), cyano (-CN), nitro ($-NO_2$), imino (=N-H), oximo (=N-OH), hydrazino (=N-NH_2), $-R^b-OR^a$, $-R^b-OC(O)-R^a$, $-R^b-OC(O)-OR^a$, $-R^b-OC(O)-N(R^a)_2$, $-R^b-N(R^a)_2$, $-R^b-C(O)R^a$, $-R^b$

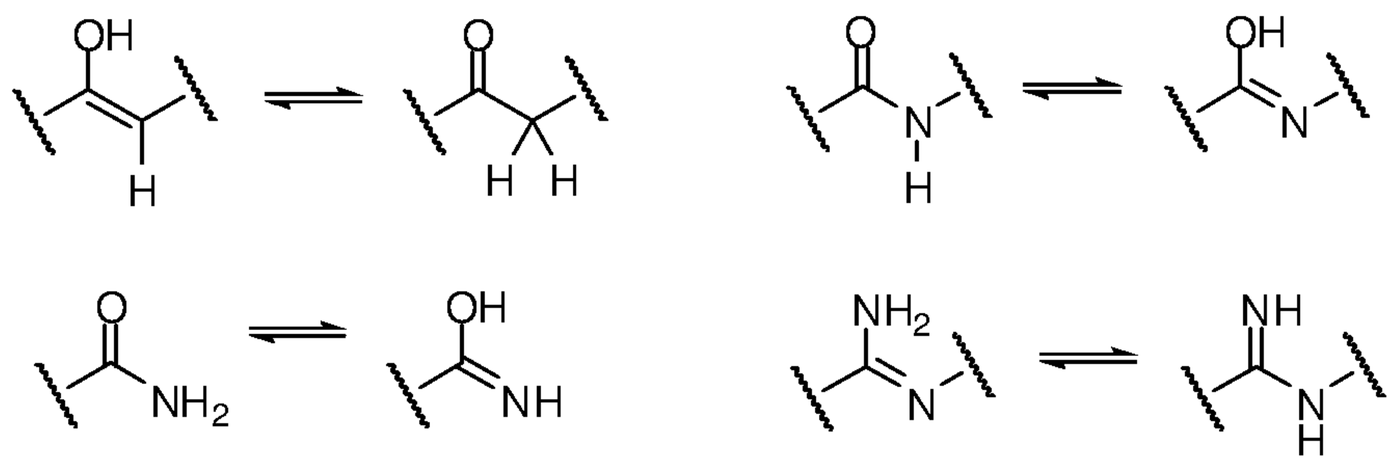
-C(O)OR^a, -R^b-C(O)N(R^a)$_2$, -R^b-O-R^c-C(O)N(R^a)$_2$, -R^b-N(R^a)C(O)OR^a, -R^b-N(R^a)C(O)R^a, -R^b-N(R^a)S(O)$_t$R^a (where t is 1 or 2), -R^b-S(O)$_t$R^a (where t is 1 or 2), -R^b-S(O)$_t$OR^a (where t is 1 or 2), and -R^b-S(O)$_t$N(R^a)$_2$ (where t is 1 or 2); and alkyl, alkenyl, alkynyl, aryl, aralkyl, aralkenyl, aralkynyl, cycloalkyl, cycloalkylalkyl, heterocycloalkyl, heterocycloalkylalkyl, heteroaryl, and heteroarylalkyl any of which may be optionally substituted by alkyl, alkenyl, alkynyl, halogen, haloalkyl, haloalkenyl, haloalkynyl, oxo (=O), thioxo (=S), cyano (-CN), nitro (-NO$_2$), imino (=N-H), oximo (=N-OH), hydrazine (=N-NH$_2$), -R^b-OR^a, -R^b-OC(O)-R^a, -R^b-OC(O)-OR^a, -R^b-OC(O)-N(R^a)$_2$, -R^b-N(R^a)$_2$, -R^b-C(O)R^a, -R^b-C(O)OR^a, -R^b-C(O)N(R^a)$_2$, -R^b-O-R^c-C(O)N(R^a)$_2$, -R^b-N(R^a)C(O)OR^a, -R^b-N(R^a)C(O)R^a, -R^b-N(R^a)S(O)$_t$R^a (where t is 1 or 2), -R^b-S(O)$_t$R^a (where t is 1 or 2), -R^b-S(O)$_t$OR^a (where t is 1 or 2) and -R^b-S(O)$_t$N(R^a)$_2$ (where t is 1 or 2); wherein each R^a is independently selected from hydrogen, alkyl, cycloalkyl, cycloalkylalkyl, aryl, aralkyl, heterocycloalkyl, heterocycloalkylalkyl, heteroaryl, or heteroarylalkyl, wherein each R^a, valence permitting, may be optionally substituted with alkyl, alkenyl, alkynyl, halogen, haloalkyl, haloalkenyl, haloalkynyl, oxo (=O), thioxo (=S), cyano (-CN), nitro (-NO$_2$), imino (=N-H), oximo (=N-OH), hydrazine (=N-NH$_2$), -R^b-OR^a, -R^b-OC(O)-R^a, -R^b-OC(O)-OR^a, -R^b-OC(O)-N(R^a)$_2$, -R^b-N(R^a)$_2$, -R^b-C(O)R^a, -R^b-C(O)OR^a, -R^b-C(O)N(R^a)$_2$, -R^b-O-R^c-C(O)N(R^a)$_2$, -R^b-N(R^a)C(O)OR^a, -R^b-N(R^a)C(O)R^a, -R^b-N(R^a)S(O)$_t$R^a (where t is 1 or 2), -R^b-S(O)$_t$R^a (where t is 1 or 2), -R^b-S(O)$_t$OR^a (where t is 1 or 2) and -R^b-S(O)$_t$N(R^a)$_2$ (where t is 1 or 2); and wherein each R^b is independently selected from a direct bond or a straight or branched alkylene, alkenylene, or alkynylene chain, and each R^c is a straight or branched alkylene, alkenylene or alkynylene chain.

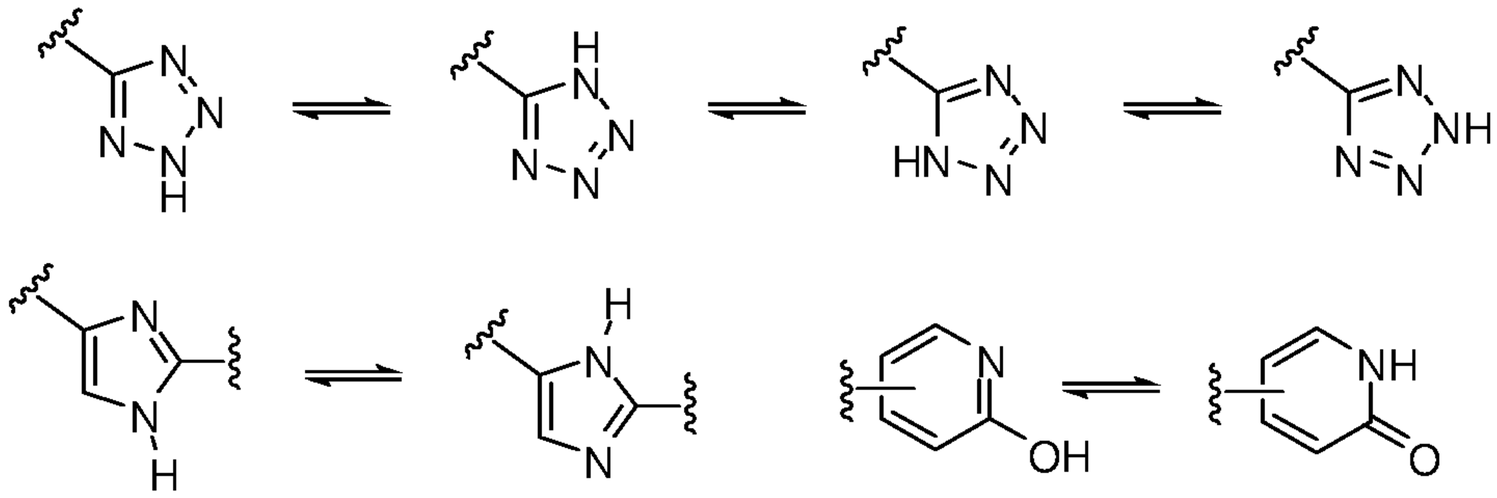
[0099] It will be understood by those skilled in the art that substituents can themselves be substituted, if appropriate. Unless specifically stated as "unsubstituted," references to chemical moieties herein are understood to include substituted variants. For example, reference to a "heteroaryl" group or moiety implicitly includes both substituted and unsubstituted variants.

[0100] Chemical entities having carbon-carbon double bonds or carbon-nitrogen double bonds may exist in *Z*- or *E*- form (or *cis*- or *trans*- form). Furthermore, some chemical entities may exist in various tautomeric forms. Unless otherwise specified, chemical entities described herein are intended to include all *Z*-, *E*- and tautomeric forms as well.

[0101] A "tautomer" refers to a molecule wherein a proton shift from one atom of a molecule to another atom of the same molecule is possible. The compounds presented herein, in certain embodiments, exist as tautomers. In circumstances where tautomerization is possible, a chemical equilibrium of the tautomers will exist. The exact ratio of the tautomers depends on several

factors, including physical state, temperature, solvent, and pH. Some examples of tautomeric equilibrium include:





.

[0102] The compounds, constructs and conjugates disclosed herein, in some embodiments, are used in different enriched isotopic forms, e.g., enriched in the content of ^{2}H, ^{3}H, ^{11}C, ^{13}C and/or ^{14}C. In one particular embodiment, the compound is deuterated in at least one position. Such deuterated forms can be made by the procedure described in U.S. Patent Nos. 5,846,514 and 6,334,997, or as otherwise known in the art. As described in U.S. Patent Nos. 5,846,514 and 6,334,997, deuteration can improve the metabolic stability and or efficacy, thus increasing the duration of action of drugs.

[0103] Unless otherwise stated, structures depicted herein are intended to include compounds which differ only in the presence of one or more isotopically enriched atoms. For example, compounds having the present structures except for the replacement of a hydrogen by a deuterium or tritium, or the replacement of a carbon by ^{13}C- or ^{14}C-enriched carbon are within the scope of the present disclosure.

[0104] The compounds of the present disclosure optionally contain unnatural proportions of atomic isotopes at one or more atoms that constitute such compounds. For example, the compounds may be labeled with isotopes, such as for example, deuterium (^{2}H), tritium (^{3}H), iodine-125 (^{125}I) or carbon-14 (^{14}C). Isotopic substitution with ^{2}H, ^{11}C, ^{13}C, ^{14}C, ^{15}C, ^{12}N, ^{13}N, ^{15}N, ^{16}N, ^{16}O, ^{17}O, ^{14}F, ^{15}F, ^{16}F, ^{17}F, ^{18}F, ^{33}S, ^{34}S, ^{35}S, ^{36}S, ^{35}Cl, ^{37}Cl, ^{79}Br, ^{81}Br, and ^{125}I are all contemplated. All isotopic variations of the compounds of the present invention, whether radioactive or not, are encompassed within the scope of the present invention.

[0105] In certain embodiments, the compounds disclosed herein have some or all of the ^{1}H atoms replaced with ^{2}H atoms. The methods of synthesis for deuterium-containing compounds are

known in the art and include, by way of non-limiting example only, the following synthetic methods.

[0106] Deuterium substituted compounds are synthesized using various methods such as described in: Dean, Dennis C.; Editor. Recent Advances in the Synthesis and Applications of Radiolabeled Compounds for Drug Discovery and Development. [In: Curr., Pharm. Des., 2000; 6(10)] **2000**, 110 pp; George W.; Varma, Rajender S. The Synthesis of Radiolabeled Compounds via Organometallic Intermediates, Tetrahedron, **1989**, 45(21), 6601-21; and Evans, E. Anthony. Synthesis of radiolabeled compounds, J. Radioanal. Chem., **1981**, 64(1-2), 9-32.

[0107] Deuterated starting materials are readily available and are subjected to the synthetic methods described herein or otherwise known to provide for the synthesis of deuterium-containing compounds. Large numbers of deuterium-containing reagents and building blocks are available commercially from chemical vendors, such as Aldrich Chemical Co.

[0108] Compounds also include crystalline and amorphous forms of those compounds, pharmaceutically acceptable salts, and active metabolites of these compounds having the same type of activity, including, for example, polymorphs, pseudopolymorphs, solvates, hydrates, unsolvated polymorphs (including anhydrates), conformational polymorphs, and amorphous forms of the compounds, as well as mixtures thereof.

[0109] The phrases "parenteral administration" and "administered parenterally" as used herein means modes of administration other than enteral and topical administration, usually by injection, and includes, without limitation, intravenous, intramuscular, intraarterial, intrathecal, intracapsular, intraorbital, intracardiac, intradermal, intraperitoneal, transtracheal, subcutaneous, subcuticular, intraarticular, subcapsular, subarachnoid, intraspinal and intrasternal injection and infusion.

[0110] The phrase "pharmaceutically acceptable" is employed herein to refer to those compounds, materials, compositions, and/or dosage forms which are, within the scope of sound medical judgment, suitable for use in contact with the tissues of human beings and animals without excessive toxicity, irritation, allergic response, or other problem or complication, commensurate with a reasonable benefit/risk ratio.

[0111] The phrase "pharmaceutically acceptable excipient" or "pharmaceutically acceptable carrier" as used herein means a pharmaceutically acceptable material, composition or vehicle, such as a liquid or solid filler, diluent, excipient, solvent or encapsulating material. Each carrier must be "acceptable" in the sense of being compatible with the other ingredients of the formulation and not injurious to the patient. Some examples of materials which can serve as pharmaceutically acceptable carriers include: (1) sugars, such as lactose, glucose and sucrose; (2) starches, such as corn starch and potato starch; (3) cellulose, and its derivatives, such as sodium

carboxymethyl cellulose, ethyl cellulose and cellulose acetate; (4) powdered tragacanth; (5) malt; (6) gelatin; (7) talc; (8) excipients, such as cocoa butter and suppository waxes; (9) oils, such as peanut oil, cottonseed oil, safflower oil, sesame oil, olive oil, corn oil and soybean oil; (10) glycols, such as propylene glycol; (11) polyols, such as glycerin, sorbitol, mannitol and polyethylene glycol; (12) esters, such as ethyl oleate and ethyl laurate; (13) agar; (14) buffering agents, such as magnesium hydroxide and aluminum hydroxide; (15) alginic acid; (16) pyrogen-free water; (17) isotonic saline; (18) Ringer's solution; (19) ethyl alcohol; (20) phosphate buffer solutions; and (21) other non-toxic compatible substances employed in pharmaceutical formulations.

[0112] As used herein, "attached" refers to a covalent bond, between two or more groups. Alternatively, attached may refer to the connection of two or more groups via a linker, e.g., a linker connecting a second binding domain to an antibody construct. A fusion may refer to a nucleic acid sequence of two separate domains being expressed in frame. For example, a binding domain can be attached as a fusion or by attachment (e.g., conjugation) via a linker to an antibody construct or other portion of a conjugate. For example, an antibody can be fused with an additional binding domain to create an antibody construct containing a fusion of the antibody and the additional binding domain. The antibody construct can be the result of the nucleic acid sequence of the binding domain being expressed in frame with the nucleic acid sequence of the antibody construct. The fusion can be the result of an in-frame nucleotide sequence encoding the antibody construct with the binding domain. As another example, an additional binding domain can be attached to an antibody construct via a linker, wherein the linker is attached (i.e., conjugated) to the binding domain and the linker is attached to the antibody construct. The binding domain can be linked to the linker by a chemical conjugation and the antibody construct can be linked to the linker by a chemical conjugation. The additional binding domain can be a second binding domain and/or a third binding domain as described herein. Furthermore, a binding domain can be a first binding domain attached to an Fc domain to produce the antibody construct as described herein, which may produce the first binding domain as a fusion with the Fc domain or a conjugate wherein the first binding domain can be linked to a linker and the linker can be linked to the Fc domain.

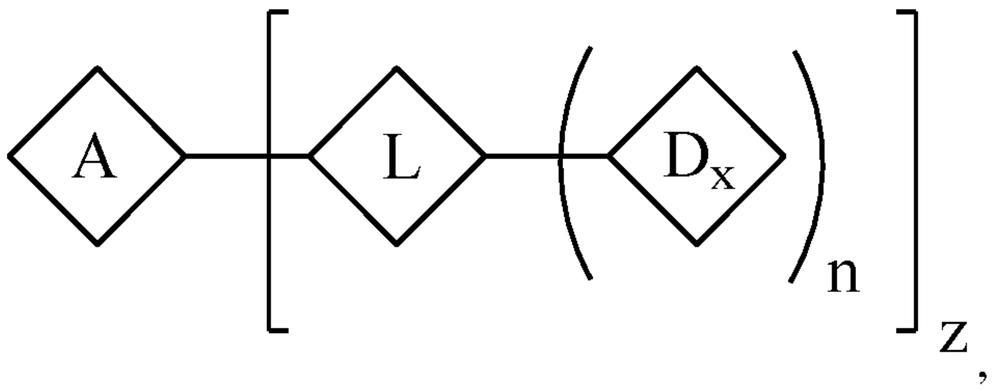
Immune-Stimulatory Conjugates

[0113] Disclosed herein are conjugates of antibody constructs, immune-stimulatory compounds and linkers, referred to as antibody construct-immune-stimulatory compound conjugates (also referred to as immune-stimulatory compound-conjugates, antibody conjugates or conjugates). The conjugates may be used in the treatment of various diseases and disorders, including cancers.

Also disclosed pharmaceutical compositions of the conjugates. In certain embodiments, immune-stimulatory compounds are attached either directly or through a linker to an antibody construct to form antibody construct-immune-stimulatory compound conjugates.

[0114] In some embodiments, the immune-stimulatory compound stimulates the immune system, or a component thereof. In some embodiments, the immune-stimulatory compound has an immune-modulatory activity. In some embodiments, the immune-stimulatory compound has an inhibitory effect on a component of the immune system, thereby stimulating an immune-modulatory activity.

[0115] In certain embodiments, conjugates are represented by the following formula:



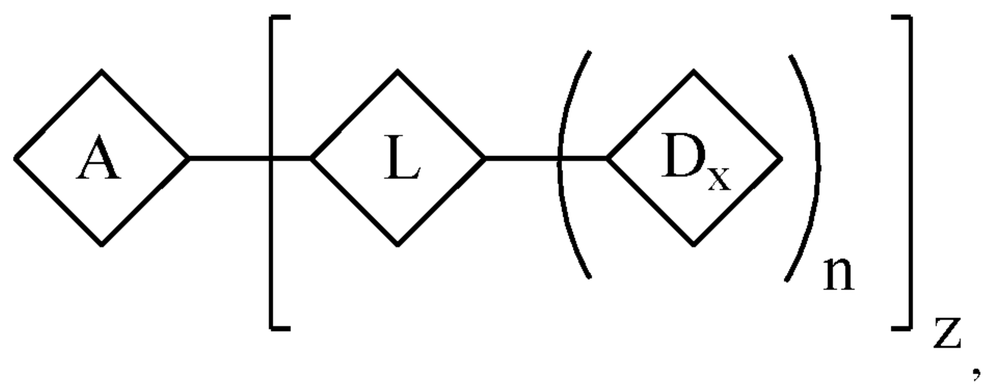
wherein A is an antibody construct, L is a linker, D is an immune-stimulatory compound, x may be from 1 to 20 (wherein each x denotes a separate compound), n may be from 1 to 20, and z may be from 1 to 20. In some embodiments, L is a cleavable linker. In some embodiments, L is a non-cleavable linker.

[0116] In some embodiments, x is 1, n is 1 and z may be from 1 to 10, such as from 1 to 9, such as from 1 to 8, such as from 2 to 8, such as from 1 to 6, such as from 3 to 5 or such as about 2.

[0117] In some embodiments, x is 1, n is 2, and z may be from 1 to 10, such as from 1 to 9, such as from 1 to 8, such as from 2 to 8, such as from 1 to 6 or such as from 3 to 5. In certain embodiments, z is 4.

[0118] In some embodiments, x may be from 1-20, n may be from 1-20, and z may be from 1 to 20.

[0119] In certain embodiments, conjugates are represented by the following formula:



wherein A is an antibody construct, L is a linker having the structure $-A_a-W_w-Y_y-$, where A is a spacer, a is 0 or 1, W is a cleavable unit, w may be from 0 to 10, Y is a stretcher, y may be from 0 to 3, D is an immunomodulatory compound, x may be from 1 to 20 (wherein each x denotes a distinct compound), n may be from 1 to 20, and z may be from 1 to 20.

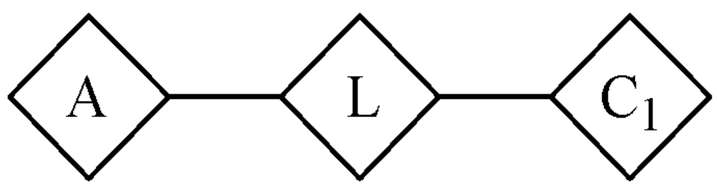
[0120] In some embodiments, a is 1, w is 0, y is 0, x is 1, n is 1, and z may be from 1 to 20, 1 to 10, 1 to 9, 1 to 8, 2 to 8, 1 to 6 or 3 to 5. In certain embodiments, z is 4.

[0121] In some embodiments, a is1, w is 1, y is from 1, x is 1, n is 1 and z may be from 1 to 10, 1 to 9, 1 to 8, 2 to 8, 1 to 6, 3 to 5, 2 or 4.

[0122] In some embodiments, a is 0 or 1, w is from 0 to 10, y is from 0-3, where at least one of a, w or y is present, x may be from 1 to 20, n may be from 1-20, and z may be from 1 to 20.

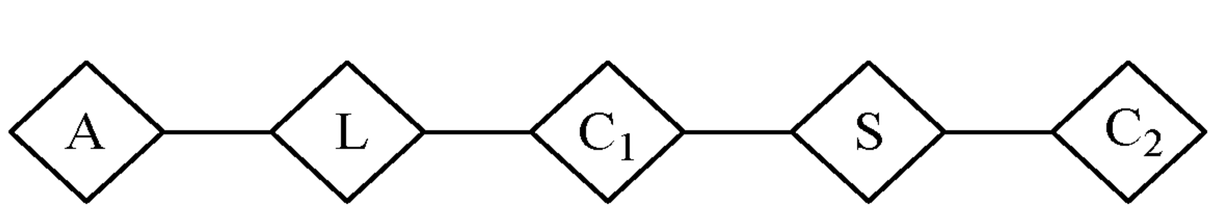
[0123] In some embodiments, the immune-stimulatory conjugates include a linker (L) that may comprise from 5 to 100 linear non-hydrogen atoms that is covalently attached to an antibody construct (A) and may be:

i) covalently attached to an immune-stimulatory compound (C_1) as in the following formula:



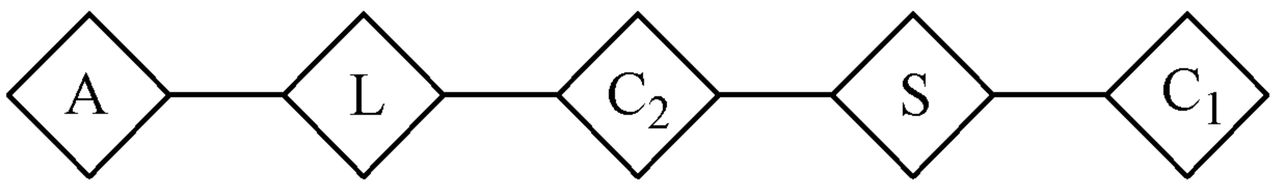
, or

ii) covalently attached to an immune-stimulatory compound (C_1) which itself may be covalently attached to a spacer (S) comprising from 5 to 100 linear non-hydrogen atoms covalently attached to a second immune-stimulatory compound (C_2) as in the following formula:



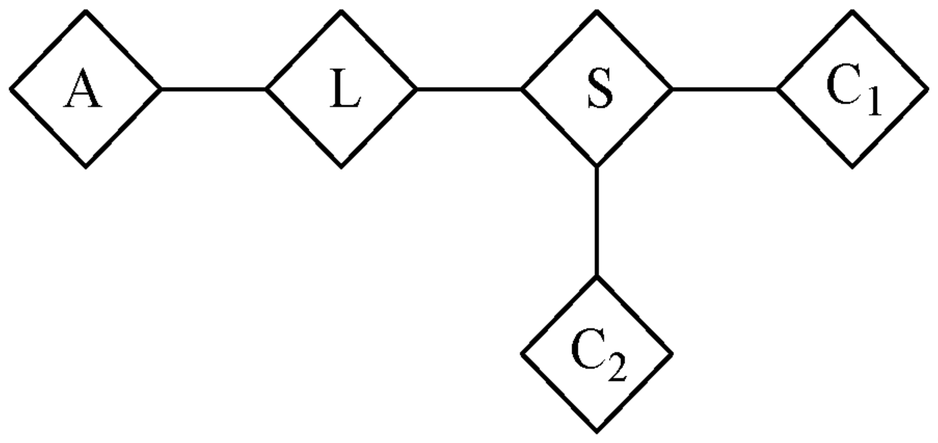
, or

iii) covalently attached an immune-stimulatory compound (C_2) that may be covalently attached to a spacer (S) comprising from 5 to 100 linear non-hydrogen atoms covalently attached to a first immune-stimulatory compound (C_1) as in the following formula:

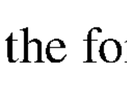


, or

iv) covalently attached to a spacer (S) comprising from 5 to100 linear non-hydrogen atoms that is covalently attached immune-stimulatory compounds (C_1 and C_2) as in the following formula:

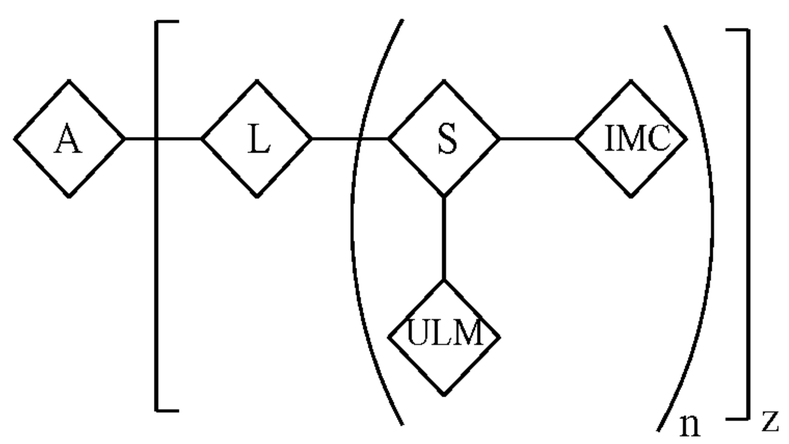


.

[0124] In some embodiments, an immune-stimulatory conjugate is provided that includes a proteolysis targeting module (PTM; also referred to as a proteolysis-targetting chimera or PROTAC) that includes an immune-modulatory compound (IMC) that is covalently attached to an E3 ubiquitin ligase binding moiety (ULM) through a spacer (S) and wherein a linker (L) is covalently attached to the protein targeting molecule and to the antibody construct (), as represented by the formula -(L-PTM$_n$)$_z$, where n is from 1-20 and z is from 1 to 20. In some embodiments, L is a cleavable linker. In some embodiments, S is a non-cleavable spacer.

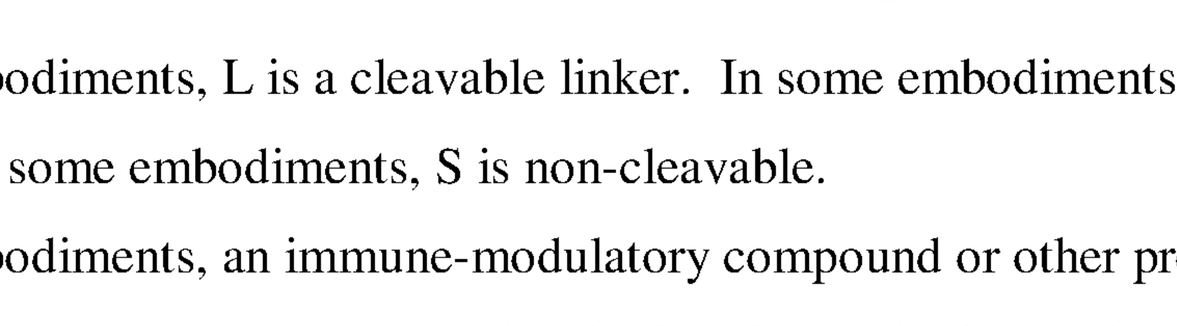
[0125] Referring to the previous formula, in some embodiments, C_1 is a target protein targeting moiety, such as an immodulatory compound, C2 is an E3 ubiquitin ligase binding moiety such that together C_1-S-C_2 may form a PTM.

[0126] In some embodiments, an immune-modulatory compound or other protein targeting moiety (IMC) is covalently attached to an E3 ubiquitin ligase binding moiety (ULM) through a spacer (S) and a linker (L) is covalently attached to the spacer, n is from 1-20 and z is from 1 to 20 as represented by the formula:



[0127] In some embodiments, L is a cleavable linker. In some embodiments, L is a non-cleavable linker. In some embodiments, S is non-cleavable.

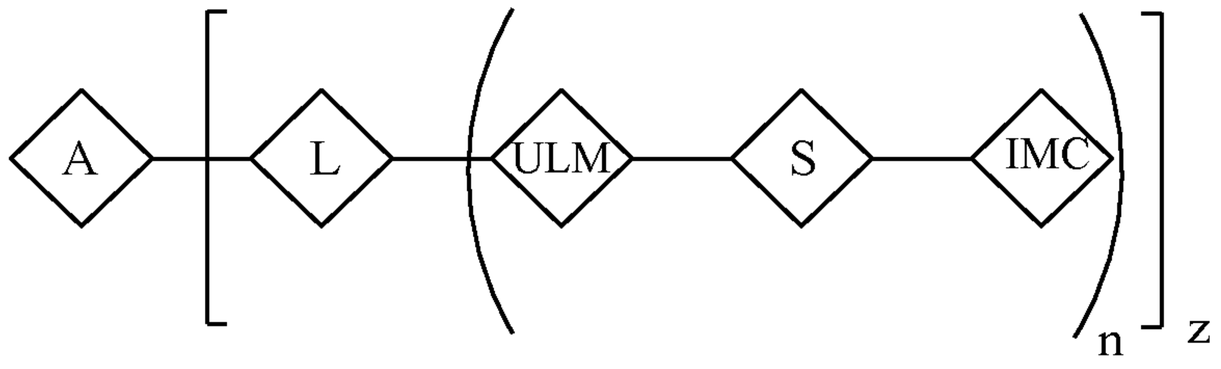
[0128] In some embodiments, an immune-modulatory compound or other protein targeting moiety (IMC) is covalently attached to an E3 ubiquitin ligase binding moiety (ULM) through a spacer (S) and a linker (L) is covalently attached to the IMC, n is from 1-20 and z is from 1 to 20 as represented by the formula:



[0129] In some embodiments, L is a cleavable linker. In some embodiments, L is a non-cleavable linker.

[0130] In some embodiments, an immune-modulatory compound or other protein targeting moiety (IMC) is covalently attached to an E3 ubiquitin ligase binding moiety (ULM) through a

spacer (S) and linker L is covalently attached to the ubiquitin E3 ligase moiety (ULM), n is from 1-20 and z is from 1 to 20 as represented by the formula:



[0131] In some embodiments, L is a cleavable linker. In some embodiments, L is a non-cleavable linker. In some embodiments, S is non-cleavable.

Tumor and Immune Cell Antigens

[0132] In cancer, there are several general groups of tumor antigens, including but not limited to: (i) viral tumor antigens which can be identical for any viral tumor of this type, (ii) carcinogenic tumor antigens which can be specific for patients and for the tumors, (iii) isoantigens of the transplantation type or tumor-specific transplantation antigens which can be different in all individual types of tumor but can be the same in different tumors caused by the same inciting biological event; and (iv) embryonic antigens.

[0133] As a result of the discovery of tumor antigens, tumor antigens have become important in the development of new cancer treatments that can specifically target the cancer. This has led to the development of antibodies directed against these tumor antigens. Such tumor antigens include the following: CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6, HPV E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page 4, VEGFR2, MAD-

CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, VTCN1 (B7-H4), VISTA, and gpNMB.

[0134] In addition to the development of antibodies against tumor antigens for cancer treatment, antibodies that target immune cells to boost the immune response have also been developed, including the following: an anti-CD40 antibody, an anti-CD47 antibody, anti-TNFR2 antibody, an anti-DEC205 antibody, an anti-CD36 mannose scavenger receptor 1 antibody, an anti-CLEC9A antibody, an anti-CLEC12A antibody, an anti-DC-SIGN antibody, an anti-BDCA-2 antibody, an anti-OX40L antibody, an anti-41BBL antibody, an anti-CD204 antibody, an anti-MARCO antibody, an anti-CLEC5A antibody, an anti-Dectin 1 antibody, and anti-Dectin 2 antibody, an anti-CLEC10A antibody, an anti-CD206 antibody, an anti-CD64 antibody, an anti-CD32A antibody, an anti-CD16A antibody, an anti-HVEM antibody, an anti-CD38 antibody, an anti-PD-L1 antibody, an anti-TREM2 antibody, an anti-CSF1R antibody, or an anti-CD32B antibody can be used to target, respectively, cell surface CD40, CD47, TNFR2, DEC-205, CD36 mannose scavenger receptor 1, CLEC9A, CLEC12A, DC-SIGN, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, CD38, PD-L1, TREM2, CSF1R, or CD32B molecules expressed by antigen presenting cells.

[0135] Cluster of Differentiation 40 (CD40) is a member of the Tumor Necrosis Factor Receptor (TNF-R) family. CD40 can be a 50 kDa cell surface glycoprotein that can be constitutively expressed in normal cells, such as monocytes, macrophages, B lymphocytes, dendritic cells, endothelial cells, smooth muscle cells, fibroblasts and epithelium, and in tumor cells, including B-cell lymphomas and many types of solid tumors. Expression of CD40 can be increased in antigen presenting cells in response to IL-1βp, IFN-γ, GM-CSF, and LPS induced signaling events.

[0136] Examples of agonistic CD40 monoclonal antibodies include CP-870,893, dacetuzumab, Chi Lob 7/4, SEA-CD40, ADC-1013, 3C3, or 3G5.

[0137] Cluster of Differentiation 205 (CD205 or DEC-205) is a member of the C-type multilectin family of endocytic receptors, which can include the macrophage mannose receptor (MMR) and the phospholipase A2 receptor (PLA_2R). DEC-205 can be a 205 kDa endocytic receptor highly expressed in cortical thymic epithelial cells, thymic medullary dendritic cells ($CD11c^+$ $CD8^+$), subpopulations of peripheral dendritic cells ($CD11c^+$ $CD8^+$). The DEC-205^+ $CD11c^+$ $CD8^+$ dendritic cells (DCs) can function in cross-presentation of antigens derived from

apoptotic cells. Additionally, DEC-205 can be significantly upregulated during DC maturation. DEC-205 can also be expressed at moderate levels in B cells and low levels in macrophages and T cells.

[0138] After antigen binding to DEC-205, the receptor-antigen complex can be internalized whereupon the antigen can be processed and be presented on the DC surface by a major histocompatibility complex class II (MHC II) or MHC class I. DEC-205 can deliver antigen to DCs for antigen presentation on MHC class II and cross-presentation on MHC class I. DEC-205 mediated antigen delivery for antigen presentation in DCs without an inflammatory stimulus can result in tolerance. Conversely, DEC-205 mediated antigen delivery in DCs in the presence of a maturational stimulus (e.g., a CD40 agonist) can result in long-term immunity via activation of antigen-specific $CD4^+$ and $CD8^+$ T cells.

[0139] CD36 mannose scavenger receptor 1 is an oxidized LDL receptor with two transmembrane domains located in the caveolae of the plasma membrane. It can be classified as a Class B scavenger receptor, which can be characterized by involvement in the removal of foreign substances and waste materials. This receptor can also be involved in cell adhesion, phagocytosis of apoptotic cells, and metabolism of long-chain fatty acids.

[0140] TNFR2 (tumor necrosis factor receptor 2), also known as TNFRSF1B (tumor necrosis factor receptor super family 1B) and CD120b, is a single-pass type I membrane protein and the member of TNFR superfamily containing 4 cysteine-rich domains (CRD) repeats. In addition to the full length membrane-anchored form, soluble TNFR2 can be generated via two distinct mechanisms: (1) shedding via proteolytic processing of the full membrane anchored from, and (2) translation from an alternatively spliced message encoding the extracellular domains of TNFR2. TNFR2 is the receptor with high affinity for TNF-alpha and approximately 5-fold lower affinity for homotrimeric lymphotoxin-alpha. TNFR2 (Tumor Necrosis Factor Receptor Type II) and TNF-receptor 1 form a heterocomplex that mediates the recruitment of two anti-apoptotic proteins, c-IAP1 and c-IAP2, which possess E3 ubiquitin ligase activity. c-IAP1 can potentiate TNF-induced apoptosis by the ubiquitination and degradation of TNF-receptor-associated factor 2, which mediates anti-apoptotic signals. Knockout studies in mice suggest a role of TNFR2 in protecting neurons from apoptosis by stimulating antioxidative pathways.

[0141] CLEC9A is a group V C-type lectin receptor. This receptor can be expressed as on myeloid lineage cells, and can be characterized as an activation receptor.

[0142] CLEC12A is a member of the C-type lectin/C-type lectin like domain super family that can be a negative regulator of granulocyte and monocyte function. It can also be involved in cell adhesion, cell-cell signaling, and glycoprotein turnover, and can play a role in the inflammatory response.

[0143] Dendritic cell-specific inter cellular adhesion molecule-3-grabbing non-integrin (DC-SIGN) or CD209, is a C-type lectin receptor that can be expressed on the surface of macrophages and dendritic cells. This receptor can recognize and bind to mannose type carbohydrates and be involved in activating phagocytosis, can mediate dendritic cell rolling, and can be involved in CD4+ T cell activation.

[0144] BDCA-2 is a C-type lectin that is a membrane protein of plasmacytoid dendritic cells. It can be involved in plasmacytoid dendritic cell function, such as ligand internalization and presentation.

[0145] OX40L, which is also referred to as CD252, is the ligand for CD134 that can be expressed on dendritic cells. It can be involved in T cell activation.

[0146] 41BBL, which is also referred to as CD137L, is a member of the TNF superfamily, and can be expressed on B cells, dendritic cells, activated T cells, and macrophages. It can provide co-stimulatory signal for T cell activation and expansion.

[0147] CD204, which is also referred to as macrophage scavenger receptor 1, is a macrophage scavenger receptor receptor. The gene for CD204 can encode three different class A macrophage scavenger receptor isoforms. The type 1 and type 2 isoforms can be involved in binding, internalizing, and processing negatively charged macromolecules, such as low density lipoproteins. The type 3 isoform can undergo altered intracellular processing in which it can be retained within the endoplasmic reticulum, and has been shown to have a dominant negative effect on the type 1 and type 2 isoforms.

[0148] Macrophage receptor with collagenous structure (MARCO), which is also referred to as SCARA2, is a class A scavenger receptor with collagen-like and cysteine-rich domains. It can be expressed in macrophages, and can bind to modified low density lipoproteins. It can be involved in the removal of foreign substances and waste materials.

[0149] C-type lectin domain family 5 member A (CLEC5A) is a C-type lectin. It can be involved in the myeloid lineage activating pathway.

[0150] Dendritic cell-associated c-type lectin-1 (Dectin 1), which is also referred to as CLEC7A, is member of the C-type lectin/C-type lectin-like super family. It can be expressed by myeloid dendritic cells, monocytes, macrophages, and B cells, and can be involved in antifungal immunity.

[0151] Dendritic cell-associated c-type lectin-2 (Dectin 2), which is also referred to as CLEC6A, is member of the C-type lectin/C-type lectin-like super family. It can be expressed by dendritic cells, macrophages, monocytes and neutrophils. It can be involved in antifungal immunity.

[0152] CLEC10A, which is also referred to as CD301, is member of the C-type lectin/C-type lectin-like super family. It can be expressed by dendritic cells, monocytes, and CD33+ myeloid cells, and can be involved in macrophage adhesion and migration.

[0153] CD206, which is also referred to as macrophage mannose receptor, is a C-type lectin type I membrane glycoprotein. It can be expressed on dendritic cells, macrophages and endothelial cells, and can act as a pattern recognition receptor and bind high-mannose structures of viruses, bacteria, and fungi.

[0154] CD64, which is also referred to as FcγRI, is a high affinity Fc receptor for IgG. It can be expressed by monocytes and macrophages. It can be involved in mediating phagocytosis, antigen capture, and antibody dependent cell-mediated cytoxicity.

[0155] CD32A, which is also referred to as FcγRIIa, is a low affinity Fc receptor. It can be expressed on monocytes, granulocytes, B cells, and eosinophils. It can be involved in phagocytosis, antigen capture, and antibody dependent cell-mediated cytoxicity.

[0156] CD16A, which is also referred to as FcγRIIIa, is low affinity Fc receptor. It can be expressed on NK cells, and can be involved in phagocytosis and antibody dependent cell-mediated cytotoxicity.

[0157] Herpesvirus entry mediator (HVEM), which is also referred to as CD270, is a member of the TNF-receptor superfamily. It can be expressed on B cells, dendritic cells, T cells, NK cells, CD33+ myeloid cells, and monocytes. It can be involved in activating the immune response.

[0158] CD32B, which is also referred to as FcγRIIb, is a low affinity Fc receptor. It can be expressed on B cells and myeloid dendritic cells. It can be involved in inhibiting maturation and cell activation of dendritic cells.

[0159] The HER2/neu (human epidermal growth factor receptor 2/receptor tyrosine-protein kinase erbB-2) is part of the human epidermal growth factor family. Overexpression of this protein can be shown to play an important role in the progression of cancer, for example, breast cancer. The HER2/neu protein can function as a receptor tyrosine kinase and autophosphorylates upon dimerization with binding partners. HER2/neu can activate several signaling pathways including, for example, mitogen-activated protein kinase, phosphoinositide 3-kinase, phospholipase Cγ, protein kinase C, and signal transducer and activator of transcription (STAT). Examples of antibodies that can target and inhibit HER2/neu can include trastuzumab and pertuzumab.

[0160] EGFR (epidermal growth factor receptor) encodes a member of the human epidermal growth factor family. Mutations that can lead to EGFR overexpression or over activity can be associated with a number of cancers, including squamous cell carcinoma and glioblastomas. EGFR can function as a receptor tyrosine kinase and ligand binding can trigger dimerization with

binding partners and autophosphorylation. The phosphorylated EGFR can then activate several downstream signaling pathways including mitogen-activated protein kinase, phosphoinositide 3-kinase, phospholipase Cγ, protein kinase C, and signal transducer and activator of transcription (STAT). Examples of antibodies that can target and inhibit EGFR can include cetuximab, panutumumab, nimotuzumab, and zalutumumab. One mutant variant of EGFR is EGFRvIII (epidermal growth factor receptor variant III, also referred to as de2-7EGFR). EGFRvIII is the result of an EGFR gene rearrangement in which exons 2-7 of the extracellular domain are deleted. This mutation can result in a mutant receptor incapable of binding to any known ligand. The resulting receptor can engage in a constitutive low-level signaling and can be implicated in tumor progression. Examples of antibodies that can target EGFRvIII can include AMG595 and ABT806.

[0161] C-Met (hepatocyte growth factor receptor) encodes a member of the receptor tyrosine kinase family of proteins. C-Met overexpression and over activity can be implicated in various cancers including lung adenocarcinomas, and high c-Met levels can be associated with poor patient outcome. Binding of hepatocyte growth factor can induce dimerization and autophosphorylation of c-Met. The c-Met receptor can activate various downstream signaling pathways including mitogen-activated protein kinase, phosphoinositide 3-kinase, and protein kinase C pathways. The antibody onartuzumab can target and inhibit c-Met.

[0162] HER3 (human epidermal growth factor receptor 3) encodes a member of the human epidermal growth factor receptor family. Ligand binding can induce dimerization and autophosphorylation of cytoplasmic tyrosine residues that then can recruit signaling proteins for downstream signaling pathway activation including mitogen-activated protein kinase and phosphoinoside 3-kinase pathways. HER3 can play an active role in cell proliferation and survival, and can be overexpressed, overactive, and/or mutated in various cancers. For example, HER3 can be overexpressed in breast, ovarian, prostate, colon, pancreas, stomach, oral, and lung cancers. The antibody patritumab can target and inhibit HER3.

[0163] MUC1 (mucin 1, cell surface associated) encodes a member of the mucin family of glycosylated proteins that can play an important role in cell adhesion and forming protective mucosal layers on epithelial surfaces. MUC1 can be proteolytically cleaved into alpha and beta subunits that form a heterodimeric complex with the N-terminal alpha subunit providing cell-adhesion functionality and the C-terminal beta subunit modulating cell signaling pathways including the mitogen activated map kinase pathway. MUC1 can play a role in cancer progression, for example, by regulating TP53-mediated transcription. MUC1 overexpression, aberrant intracellular localization, and glycosylation changes can all be associated with carcinomas including pancreatic cancer cells. The antibody clivatuzumab can target MUC1.

[0164] MUC16 (mucin 16, cell surface associated) encodes the largest member of the mucin family of glycosylated proteins that can play an important role in cell adhesion and forming protective mucosal layers on epithelial surfaces. MUC16 can be a highly glycosylated 2.5MDa transmembrane protein that can provide a hydrophilic lubricating barrier on epithelial cells. The cytoplasmic tail of MUC16 can be involved with various signaling pathways including the JAK2-STAT3 and Src kinase pathways. A peptide epitope of MUC16 can be used as biomarker for detecting ovarian cancer. Elevated expression of MUC16 can be present in advanced ovarian cancers and pancreatic cancers. The antibody sofituzumab can target MUC16.

[0165] EPCAM (epithelial cell adhesion molecule) encodes a transmembrane glycoprotein that can be frequently and highly expressed in carcinomas and tumor-initiating cells. EPCAM can also be a pluripotent stem cell marker. EPCAM can modulate a variety of pathways including cell-cell adhesion, cellular proliferation, migration, invasion, maintenance of a pluripotent state, and differentiation in the context of tumor cells. The antibodies edrecolomab and adecatumumab can target EPCAM.

[0166] MSLN (mesothelin) encodes a 40 kDa cell GPI-anchored membrane surface protein believed to function in cell adhesion. MSLN is overexpressed in mesothelioma and certain types of pancreatic, lung, and ovarian cancers. MSLN-related peptides that circulate in serum of patients suffering from pleural mesothelioma are used as biomarkers for monitoring the disease. MSLN may promote metastasis by inducing matrix metalloproteinase 7 and 9 expression. The monoclonal antibody anetumab has been developed to target MSLN.

[0167] CA6 (carbonic anhydrase VI) encodes one of several isozymes of carbonic anhydrase. CA6 is found in salivary glands and may play a role in the reversible hydration of carbon dioxide. CA6 is expressed in human serous ovarian adenocarcinomas. The monoclonal antibody huDS6 has been developed to target CA6.

[0168] NAPI2B (sodium/phosphate cotransporter 2B) encodes a type II sodium-phosphate cotransporter. NAPI2B is highly expressed on the tumor surface in lung, ovarian, and thyroid cancers as well as in normal lung pneumocytes. The monoclonal antibody lifastuzumab has been developed to target NAPI2B.

[0169] TROP2 (trophoblast antigen 2) encodes a transmembrane glycoprotein that acts as an intracellular calcium signal transducer. TROP2 binds to multiple factors such as IGF-1, claudin-1, claudin-7, cyclin D1, and PKC. TROP2 including intracellular calcium signaling and the mitogen activated protein kinase pathway. TROP 2 plays a role in cell self-renewal, proliferation, invasion, and survival. Discovered first in trophoblast cells that have the ability to invade uterine decidua during placental implantation, TROP2 overexpression has been shown to be capable of stimulating cancer growth. TROP2 overexpression has been observed in breast, cervix,

colorectal, esophagus, lung, non-Hodgkin's lymphoma, chronic lymphocytic lymphoma, Raji Burkitt lymphoma, oral squamous cell, ovarian, pancreatic, prostate, stomach, thyroid, urinary bladder, and uterine carcinomas. The monoclonal antibody sacituzumab has been developed to target TROP2.

[0170] CEA (carcinoembryonic antigen; also referred to as CEACAM5) is a member of a family of related glycoproteins involved in cell adhesion. CEA is a biomarker for gastrointestinal cancers and may promote tumor development by means of its cell adhesion function. CEA levels have been found to be elevated in serum of individuals with colorectal carcinoma. CEA levels have also been found to be elevated in gastric carcinoma, pancreatic carcinoma, lung carcinoma, breast carcinoma, and medullary thyroid carcinoma. The monoclonal antibodies PR1A3 and Ab2-3 have been developed to target CEA.

[0171] CLDN18.2 (claudin 18) encodes a member of the claudin family of integral membrane proteins. CLDN18.2 is a component of tight junctions that create a physical barrier to prevent diffusion of solutes and water through the paracellular space between epithelial cells. CLDN18.2 is overexpressed in infiltrating ductal adenocarcinomas, but is reduced in some gastric carcinomas. The monoclonal antibody claudiximab has been developed to target CLDN18.2.

[0172] FAP (fibroblast activation protein, alpha) encodes a homodimeric integral membrane protein from a family of serine proteases. FAP is believed to play a role in many processes including tissue remodeling, fibrosis, wound healing, inflammation, and tumor growth. FAP enhances tumor growth and invasion by promoting angiogenesis, collagen fiber degradation and apoptosis, and by downregulating the immune response. FAP is selectively expressed on fibroblasts within the tumor stroma. The monoclonal antibody sibrotuzumab has been developed to target FAP.

[0173] EphA2 (EPH Receptor A2) encodes a member of the ephrin receptor subfamily of the protein-tyrosine kinase family. EphA2 binds to ephrin-A ligands. Activation of EphA2 receptor upon ligand binding can result in modulation of migration, integrin-mediated adhesion, proliferation, and differentiation. EphA2 is overexpressed in various cancers including breast, prostate, urinary bladder, skin, lung, ovarian, and brain cancers. High EphA2 expression is also correlated with poor prognosis. The monoclonal antibodies DS-8895a opt1, DS-8895 opt2, and the 1C1 antibody in MEDI-547 have been developed to target EphA2.

[0174] RON (macrophage stimulating 1 receptor) encodes a cell surface receptor for macrophage stimulating protein (MSP) with tyrosine kinase activity and belongs to the MET proto-oncogene family. RON has significant structural similarity and sequence identity with the cancer-related gene C-MET. RON plays a significant role in KRAS oncogene addiction and has also been shown to be overexpressed in pancreatic cancers. Altered Ron expression and activation has been

associated with decreased survival and cancer progression in various cancers including gastric, colon, breast, bladder, renal cell, ovarian, and hepatocellular cancers. The monoclonal antibody narnatumab has been developed to target RON.

[0175] LY6E (lymphocyte antigen 6 complex, locus E) encodes an interferon alpha-inducible GPI-anchored cell membrane protein. LY6E is overexpressed in numerous cancers including lung, gastric, ovarian, breast, kidney, pancreatic, and head and neck carcinomas. The monoclonal antibody in RG7841 has been developed to target LY6E.

[0176] FRA (folate receptor alpha) encodes a GPI-anchored cell surface glycoprotein. FRA binds folic acid, a molecule needed for cell growth and DNA synthesis, and mediates its internalization via receptor-mediated endocytosis. FRA is overexpressed in various cancers including prostate, breast, ovarian, pancreatic, mesothelioma, non-small cell lung carcinoma, and head and neck cancer. FRA expression has also been found to enhance tumor cell proliferation. The monoclonal antibodies farletuzumab and mirvetuximab have been developed to target FRA.

[0177] PSMA (prostate specific membrane antigen) is a type II transmembrane glycoprotein belonging to the M28 peptidase family that is expressed in all types of prostate tissues. PSMA is upregulated in cancer cells within the prostate and is used as a marker for prostate cancer. PSMA expression may also serve as a predictor of disease recurrence in prostate cancer patients. The monoclonal antibodies J591 variant 1 and J591 variant 2 have been developed to target PSMA.

[0178] DLL3 (delta-like 3) encodes a ligand in the Notch signaling pathway that is associated with neuroendocrine cancer. DLL3 is most highly expressed in the fetal brain and is involved in somitogenesis in the paraxial mesoderm. DLL3 is expressed on tumor cell surfaces but not in normal tissues. The monoclonal antibody rovalpituzumab has been developed to target DLL3.

[0179] PTK7 (tyrosine protein kinase-like 7) encodes a receptor tyrosine kinase that lacks catalytic tyrosine kinase activity but is nevertheless capable of signal transduction. PTK7 interacts with the WNT signaling pathway, which itself has important roles in epithelial mesenchymal transition and various cancers such as breast cancer. PTK7 overexpression has been associated with patient prognosis depending on the cancer type. The monoclonal antibodies in PF-06647020 and the anti-PTK7 antibody described by SEQ ID NOs: 440 and 445 have been developed to target PTK7.

[0180] LIV1 (LIV-1 protein, estrogen regulated) encodes a member of the LIV-1 subfamily of ZIP (Zrt-, Irt-like proteins) zinc transporters. LIV1 is an estrogen regulated protein that transports zinc and/or other ions across the cell membrane. Elevated levels of LIV1 have been shown in estrogen receptor positive breast cancers, and LIV1 is used as a marker of ER-positive cancers. LIV1 has also been implicated as a downstream target of the STAT3 transcription factor and as playing an essential role in the nuclear localization of the Snail transcription factor that

modulates epithelial-to-mesenchymal transition. The monoclonal antibody in SGN-LIV1A has been developed to target LIV1.

[0181] ROR1 (receptor tyrosine kinase-like orphan receptor 1) encodes a member of the ROR family of orphan receptors. ROR1 has been found to bind Wnt5a, a non-canonical Wnt via a Frizzled domain (FZD), and plays an important role in skeletal, cardiorespiratory, and neurological development. ROR1 expression is predominantly restricted to embryonic development and is absent in most mature tissues. In contrast, ROR1 expression is upregulated in B-Cell chronic lymphocytic leukemia, acute lymphocytic leukemia, non-Hodgkin lymphoma, and myeloid malignancies. The monoclonal antibody cirmtuzumab has been developed to target ROR1.

[0182] MAGE-A3 (melanoma-associated antigen 3) encodes a member of the melanoma-associated antigen gene family. The function of MAGE-A3 is not known, but its elevated expression has been observed in various cancers including melanoma, non-small cell lung cancer, and in putative cancer stem cell populations in bladder cancer. The monoclonal antibody described by SEQ ID NOs: 479 and 484 has been developed to target MAGE-A3.

[0183] NY-ESO-1 (New York esophageal squamous cell carcinoma 1) encodes a member of the cancer-testis family of proteins. Cancer-testis antigen expression is normally restricted to testicular germ cells in adult tissues, but has been found to be aberrantly expressed in various tumors including soft tissue sarcomas, melanoma, epithelial cancers, and myxoid and round cell liposarcomas. The monoclonal antibody described by SEQ ID Nos: 492 and 497 has been developed to target NY-ESO-1.

Binding Domain

[0184] The binding domain of an antibody construct is selected to recognize an antigen or molecule. For example, an antigen can be a cell surface marker on target cells associated with a disease or condition. An antigen can be a peptide or fragment thereof. An antigen can be expressed on an immune cell. An antigen can be expressed on an antigen-presenting cell. An antigen can be expressed on a dendritic cell, a macrophage, or a B cell. An antigen on an antigen presenting cell can be a cell lineage marker or a cell surface protein expressed preferentially on antigen presenting cells or a subset of antigen presenting cells. An antigen can be a peptide presented in a major histocompatibility complex by cell. As another example, a cell surface marker recognized by the antigen binding domain can include macromolecules associated with viral and bacterial diseases or infections, autoimmune diseases and cancerous diseases. An antigen can be a tumor antigen or fragment thereof. A tumor antigen can be any antigen listed on tumor antigen databases, such as TANTIGEN, or peptide databases for T cell-defined tumor

antigens, such as the Cancer Immunity Peptide database. A tumor antigen can also be any antigen listed in the review by Chen (Chen, Cancer Immun 2004 [updated 2004 Mar 10; cited 2004 Apr 1]). An antigen can be or can be at least 80% homologous CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6, HPV E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page 4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, , TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, VTCN1 (B7-H4), VISTA, or gpNMB.

[0185] In some embodiments, an antigen binding domain recognizes a single antigen. In some embodiments, an antigen binding domain recognizes two or more different antigens.

[0186] An antibody construct can include one or more binding domains. For example, an antibody construct can comprise a first binding domain. An antibody construct can also comprise a second binding domain. A binding domain can specifically bind to an antigen on a cell surface. A binding domain can specifically bind to an antigen on a cell surface, for example, of a tumor or cancer cell, an immune cell, or of an antigen presenting cell, such as a dendritic cell or macrophage. A binding domain can be a cell surface receptor agonist. A binding domain can be an antigen binding domain. An antigen binding domain can be a cell surface receptor agonist. An antigen binding domain can be a domain that can specifically bind to an antigen. An antigen binding domain can specifically bind to a tumor antigen. An antigen binding domain can be an antigen-binding portion of an antibody or an antigen binding fragment thereof. A binding domain can recognize a single antigen.

[0187] An antibody construct can include, for example, one, two, three, four, five, six, seven, eight, nine, ten, or more antigen binding domains. An antibody construct, such as an antibody,

can include two antigen binding domains in which each antigen binding domain can recognize the same antigen. An antibody construct, such as a bi-specific antibody, can include two antigen binding domains in which each antigen binding domain can recognize different antigens. An antibody construct can include three antigen binding domains in which each antigen binding domain can recognize different antigens. An antibody construct can include three antigen binding domains in which two of the antigen binding domains can recognize the same antigen. An antigen binding domain can be in a scaffold, in which a scaffold is a supporting framework for the antigen binding domain. An antigen binding domain can be in a non-antibody scaffold. An antigen binding domain can be in an antibody scaffold. An antibody construct can comprise an antigen binding domain in a scaffold. The antibody construct can further comprise an Fc fusion protein product. In some embodiments, the antibody construct is an Fc fusion protein.

[0188] In some embodiments, an antibody construct can comprise an antigen binding domain that can specifically bind to a tumor antigen. A tumor antigen, also referred to as a tumor associated antigen, is an antigen that can be expressed by a cancer cell, a neoplastic tumor cell and/or within a tumor microenvironment. It is preferably not expressed or expressed at low levels on normal (non-cancerous) cells. For example, a tumor antigen can be an antigen expressed on a cell associated within a tumor, such as a neoplastic cell, or a tumor associated cell such as a stromal cell, endothelial cell, fibroblast, or tumor-infiltrating immune cell. For example, the tumor antigen Her2/Neu can be overexpressed by certain types of breast and ovarian cancer. A tumor antigen can also be ectopically expressed by a tumor and contribute to deregulation of the cell cycle, reduced apoptosis, metastasis, or escape from immune surveillance. Tumor antigens can generally be proteins or polypeptides derived therefrom, but also can be glycans, lipids, or other small organic molecules. Additionally, a tumor antigen can arise through increases or decreases in post-translational processing exhibited by a cancer cell compared to a normal cell, for example, protein glycosylation, protein lipidation, protein phosphorylation, or protein acetylation.

[0189] In certain embodiments, a binding domain specifically can bind to a tumor associated antigen, such as CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1 antigen, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6, HPV E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation

breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, VTCN1 (B7-H4), VISTA, or gpNMB.

[0190] In some embodiments, a binding domain specifically can bind to a tumor associated antigen having at least 80%, 90%, 95%, 97%, 98%, 99% or 100% sequence identity to CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1 antigen, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6, HPV E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, MYCN, RhoC, TRP-2, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, CYP1B1, PLAV1, BORIS, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, VTCN1 (B7-H4), VISTA, or gpNMB.

[0191] In certain embodiments, a binding domain specifically binds to an antigen selected from the group consisting of comprising Her2/Neu (CD340), EGFR, CMET, HER3, MUC1, MUC16, EPCAM, MSLN, CA6, NAPI2B, TROP2, CEA, CLDN18.2, EGFRvIII, FAP, EphA2, RON, LY6E, FRA, PSMA, DLL3, PTK7, LIV1, ROR1, MAGE-A3, and NY-ESO-1.

[0192] A binding domain of an antibody construct can be selected from any domain that specifically binds to an antigen, including but not limited to, from a monoclonal antibody, a

polyclonal antibody, a recombinant antibody, or a functional fragment thereof, for example, a heavy chain variable domain (V_H) and a light chain variable domain (V_L), or from a non-antibody such as a DARPin, an affimer, an avimer, a knottin, a monobody, an affinity clamp, an ectodomain, a receptor ectodomain, a receptor, a cytokine, a ligand, an immunocytokine, a T-cell receptor, a VNAR, an anticalin, or a recombinant T-cell receptor. In some embodiments, a binding domain of an antibody construct is from a monoclonal antibody, a polyclonal antibody, a recombinant antibody, or a functional fragment thereof, for example, a heavy chain variable domain (V_H) and a light chain variable domain (V_L).

[0193] The antigen binding domain of an antibody construct can be at least 80%, at least 85%, at least 90%, at least 95%, or at least 99% homologous to an antigen binding domain selected from, but not limited to, a monoclonal antibody, a polyclonal antibody, a recombinant antibody, or a functional fragment thereof, for example, a heavy chain variable domain (V_H) and a light chain variable domain (V_L), or from a non-antibody, such as a DARPin, an affimer, an avimer, a knottin, a monobody, an affinity clamp, an ectodomain, a receptor ectodomain, a receptor, a cytokine, a ligand, an immunocytokine, a T-cell receptor, a VNAR, an anticalin, or a recombinant T-cell receptor.

[0194] A binding domain, for example an antigen binding domain from a monoclonal antibody, can comprise a light chain and a heavy chain. In one aspect, the monoclonal antibody binds to an antigen present on the surface of an antigen presenting cell (APC antigen) and comprises the light chain of an anti-APC antigen antibody and the heavy chain of an anti-APC antigen antibody, which bind an APC antigen. In another aspect, the monoclonal antibody binds to a tumor antigen comprises the light chain of a tumor antigen (anti-tumor) antibody and the heavy chain of a tumor antigen (anti-tumor) antibody, which bind to the tumor antigen.

[0195] An antibody construct can be an antibody. An antibody molecule can include of two identical light protein chains (light chains) and two identical heavy protein chains (heavy chains), all held together covalently by interchain disulfide linkages. Structurally, various functions of an antibody can be confined to discrete protein regions or domains. The sites that can recognize and can bind to antigen consist of three complementarity determining regions (CDRs; also referred to as hyper-variable regions) that lie within the variable heavy chain regions and within the variable light chain regions at the N-terminal ends of the two heavy and two light chains. The constant domains can provide the general framework of the antibody and may not be involved directly in binding the antibody to an antigen, but can be involved in various effector functions, such as participation of the antibody in antibody-dependent cellular cytotoxicity (ADCC).

[0196] The variable domains of natural light and heavy chains can have the same general structures, and each domain can comprise four framework regions, whose sequences can be

somewhat conserved, connected by three CDRs. The four framework regions can largely adopt a β-sheet conformation and the CDRs can form loops connecting, and in some aspects forming part of, the β -sheet structure. The CDRs in each chain can be held in close proximity by the framework regions and, with the CDRs from the other chain, can contribute to the formation of the antigen binding site.

[0197] An antibody can include an antibody of any type, which can be assigned to different classes of immunoglobins, e.g., IgA, IgD, IgE, IgG, and IgM. Several different classes can be further divided into isotypes, e.g., IgG1, IgG2, IgG3, IgG4, IgA1, and IgA2. Exemplary heavy chain sequences of reference antibodies can be used to identify residue variants and mutants.

[0198] An exemplary heavy chain sequence for human IgG1 heavy chain is that of the human IgG1 antibody, and can comprise:

ASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGG
PSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQY
NSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR
EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDK
SRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 898).

[0199] An exemplary heavy chain reference sequence for human IgG2 heavy chain can comprise:

ASTKGPSVFPLAPCSRSTSESTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSNFGTQTYTCNVDHKPSNTKVDKTVERKCCVECPPCPAPPVAGPSVF
LFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTF
RVVSVLTVVHQDWLNGKEYKCKVSNKGLPAPIEKTISKTKGQPREPQVYTLPPSREEMT
KNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPMLDSDGSFFLYSKLTVDKSRWQ
QGNVFSCSVMHEALHNHYTQKSLSLSPGK (SEQ ID NO: 899).

[0200] An exemplary heavy chain reference sequence for human IgG4 heavy chain can comprise:

ASTKGPSVFPLAPCSRSTSESTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS
GLYSLSSVVTVPSSSLGTKTYTCNVDHKPSNTKVDKRVESKYGPPCPSCPAPEFLGGPSV
FLFPPKPKDTLMISRTPEVTCVVVDVSQEDPEVQFNWYVDGVEVHNAKTKPREEQFNST
YRVVSVLTVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKGQPREPQVYTLPPSQEEM
TKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSRLTVDKSRW
QEG NVFSCSVMHEALHNHYTQKSLSLSLGK (SEQ ID NO: 900).

[0201] The heavy-chain constant regions (Fc) that corresponds to the different classes of immunoglobulins can be α, δ, ε, γ, and μ. The light chains can be one of either kappa or κ and

lambda or λ, based on the amino acid sequences of the constant domains. The Fc region can contain an Fc domain. An Fc receptor can bind an Fc domain. An Fc domain can comprise amino acid residues 216 to 447 of an IgG1, which are part of SEQ ID NO: 898. An Fc domain can comprise amino acid residues 216 to 442 of an IgG2, which are part of SEQ ID NO: 899. An Fc domain can comprise amino acid residues 216 to 444 of an IgG4, which are part of SEQ ID NO: 900. Antibody constructs can also include any fragment or recombinant forms thereof (e.g., scFVs and domain antibodies). Antibody constructs can also include any fragment or recombinant forms thereof (e.g., scFVs and domain antibodies) of non-antibody scaffolds, including but not limited to anti-calins, affibodies, affilins, atrimers, avimers, bicyclic peptides, centyrins, Cys-knots, Darpins, fibronections, Kunitz domains, O-bodies, or peptibodies.

[0202] An antibody construct can comprise an antigen binding domain of an antibody. An antigen binding domain of an antibody can comprise one or more light chain CDRs (LCDRs) and one or more heavy chain CDRs (HCDRs), or one or more LCDRs or one or more HCDRs. For example, an antibody binding domain of an antibody construct can comprise one or more of the following: a light chain complementary determining region 1 (LCDR1), a light chain complementary determining region 2 (LCDR2), or a light chain complementary determining region 3 (LCDR3). For another example, an antibody binding domain can comprise one or more of the following: a heavy chain complementary determining region 1 (HCDR1), a heavy chain complementary determining region 2 (HCDR2), or a heavy chain complementary determining region 3 (HCDR3). In some embodiments, an antigen binding domain comprises LCDR1, LCDR2, LCDR3, HCDR1, HCDR2 and HCDR3. Unless stated otherwise, the CDRs described herein can be defined according to the IMGT (the international ImMunoGeneTics information system).

[0203] An antigen binding domain can comprise only the heavy chain of an antibody. An antigen binding domain can comprise only the variable domain of the heavy chain of an antibody. Alternatively, an antigen binding domain can comprise only the light chain of an antibody. An antigen binding domain can comprise only the variable light chain of an antibody.

[0204] An antibody construct can comprise an antibody fragment. An antibody fragment can include (i) a Fab fragment, a monovalent fragment consisting of the V_L, V_H, C_L and C_{H1} domains; (ii) a $F(ab')_2$ fragment, a bivalent fragment comprising two Fab fragments linked by a disulfide bridge at the hinge region; and (iii) a Fv fragment consisting of the V_L and V_H domains of a single arm of an antibody. Although the two domains of the Fv fragment, V_L and V_H, can be coded for by separate genes, they can be linked by a synthetic linker to be made as a single protein chain in which the V_L and V_H regions pair to form monovalent molecules. $F(ab')_2$ and Fab' moieties can be produced recombinantly.

[0205] An Fv can be the minimum antibody fragment which contains a complete antigen-recognition and antigen-binding site. This region can consist of a dimer of one heavy chain and one light chain variable domain in tight, non-covalent association. In this configuration the three hypervariable regions of each variable domain can interact to define an antigen-binding site on the surface of the V_H-V_L dimer. A single variable domain (or half of an Fv comprising only CDRs specific for an antigen) can recognize and bind antigen, although at a lower affinity than the entire binding site.

[0206] An antibody used herein can be chimeric or "humanized." Chimeric and humanized forms of non-human (e.g., murine) antibodies can be chimeric immunoglobulins, immunoglobulin chains or fragments thereof (such as Fv, Fab, Fab', $F(ab')_2$ or other target-binding subdomains of antibodies), which can contain minimal sequences derived from non-human immunoglobulin. In general, the humanized antibody can comprise substantially all of at least one, and typically two, variable domains, in which all or substantially all of the CDR regions correspond to those of a non-human immunoglobulin and all or substantially all of the frame work regions (FR) are those of a human immunoglobulin sequence. The humanized antibody can also comprise at least a portion of an immunoglobulin constant region (Fc), typically that of a human immunoglobulin consensus sequence.

[0207] An antibody described herein can be a human antibody. As used herein, "human antibodies" can include antibodies having, for example, the amino acid sequence of a human immunoglobulin and include antibodies isolated from human immunoglobulin libraries or from animals transgenic for one or more human immunoglobulins that do not express endogenous immunoglobulins. Human antibodies can be produced using transgenic mice which are incapable of expressing functional endogenous immunoglobulins, but which can express human immunoglobulin genes. Completely human antibodies that recognize a selected epitope can be generated using guided selection. In this approach, a selected non-human monoclonal antibody, e.g., a mouse antibody, is used to guide the selection of a completely human antibody recognizing the same epitope

[0208] An antibody described herein can be a bispecific antibody or a dual variable domain antibody (DVD). Bispecific and DVD antibodies are monoclonal, often human or humanized, antibodies that have binding specificities for at least two different antigens.

[0209] An antibody described herein can be a derivatized antibody. For example, derivatized antibodies can be modified by glycosylation, deglycosylation, defucosylation, acetylation, pegylation, phosphorylation, amidation, derivatization by known protecting/blocking groups, proteolytic cleavage, or linkage to a cellular ligand or other protein.

[0210] An antibody described herein can have a sequence that has been modified to alter at least one constant region-mediated biological effector function relative to the corresponding wild type sequence. For example, in some embodiments, the antibody can be modified to reduce at least one constant region-mediated biological effector function relative to an unmodified antibody, e.g., reduced binding or increased binding to the Fc receptor (FcR). FcR binding can be reduced or increased by, for example, mutating the immunoglobulin constant region segment of the antibody at particular regions necessary for FcR interactions.

[0211] An antibody described herein can be modified to acquire or improve at least one constant region-mediated biological effector function relative to an unmodified antibody, e.g., to enhance FcγR interactions. For example, an antibody with a constant region that binds FcγRIIA, FcγRIIB and/or FcγRIIIA with greater affinity than the corresponding wild type constant region can be produced according to the methods described herein.

[0212] An antibody described herein can bind to tumor cells, such as an antibody against a cell surface receptor or a tumor antigen.

[0213] An antibody construct can comprise a first binding domain. An antibody construct can comprise a first binding domain that specifically binds an antigen. An antibody construct can comprise a first binding domain that specifically binds a tumor antigen. A first binding domain can specifically bind a tumor antigen, wherein the tumor antigen is selected from the group consisting CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6, HPV E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin,

VTCN1 (B7-H4), VISTA, gpNMB, or any fragment thereof. An antibody construct can comprise a first binding domain that specifically binds a tumor antigen on a tumor cell, a tumor fragment, an immune cell or an antigen presenting cell.

[0214] An antibody construct can comprise a first binding domain that specifically binds a tumor antigen. The construct can comprise a first binding domain comprising one or more CDRs, typically a set of six CDRs. A first binding domain can comprise at least 80% sequence identity to any sequence in **TABLE** 1. An antibody construct can comprise a first binding domain that binds a tumor antigen, wherein the first binding domain comprises at least 80% sequence identity to: a) HCDR1 comprising an amino acid sequence of SEQ ID NO: 13, HCDR2 comprising an amino acid sequence of SEQ ID NO: 14, HCDR3 comprising an amino acid sequence of SEQ ID NO: 15, LCDR1 comprising an amino acid sequence of SEQ ID NO: 18, LCDR2 comprising an amino acid sequence of SEQ ID NO: 19, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 20; b) HCDR1 comprising an amino acid sequence of SEQ ID NO: 26, HCDR2 comprising an amino acid sequence of SEQ ID NO: 27, HCDR3 comprising an amino acid sequence of SEQ ID NO: 28, LCDR1 comprising an amino acid sequence of SEQ ID NO: 31, LCDR2 comprising an amino acid sequence of SEQ ID NO: 32, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 33; c) HCDR1 comprising an amino acid sequence of SEQ ID NO: 39, HCDR2 comprising an amino acid sequence of SEQ ID NO: 40, HCDR3 comprising an amino acid sequence of SEQ ID NO: 41, LCDR1 comprising an amino acid sequence of SEQ ID NO: 44, LCDR2 comprising an amino acid sequence of SEQ ID NO: 45, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 46; d) HCDR1 comprising an amino acid sequence of SEQ ID NO: 52, HCDR2 comprising an amino acid sequence of SEQ ID NO: 53, HCDR3 comprising an amino acid sequence of SEQ ID NO: 54, LCDR1 comprising an amino acid sequence of SEQ ID NO: 57, LCDR2 comprising an amino acid sequence of SEQ ID NO: 58, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 59; e) HCDR1 comprising an amino acid sequence of SEQ ID NO: 65, HCDR2 comprising an amino acid sequence of SEQ ID NO: 66, HCDR3 comprising an amino acid sequence of SEQ ID NO: 67, LCDR1 comprising an amino acid sequence of SEQ ID NO: 70, LCDR2 comprising an amino acid sequence of SEQ ID NO: 71, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 72; f) HCDR1 comprising an amino acid sequence of SEQ ID NO: 78, HCDR2 comprising an amino acid sequence of SEQ ID NO: 79, HCDR3 comprising an amino acid sequence of SEQ ID NO: 80, LCDR1 comprising an amino acid sequence of SEQ ID NO: 83, LCDR2 comprising an amino acid sequence of SEQ ID NO: 84, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 85; g) HCDR1 comprising an amino acid sequence of SEQ ID NO: 91, HCDR2 comprising an amino acid sequence of SEQ ID NO: 92, HCDR3 comprising an amino acid sequence of SEQ

ID NO: 93, LCDR1 comprising an amino acid sequence of SEQ ID NO: 96, LCDR2 comprising an amino acid sequence of SEQ ID NO: 97, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 98; h) HCDR1 comprising an amino acid sequence of SEQ ID NO: 104, HCDR2 comprising an amino acid sequence of SEQ ID NO: 105, HCDR3 comprising an amino acid sequence of SEQ ID NO: 106, LCDR1 comprising an amino acid sequence of SEQ ID NO: 109, LCDR2 comprising an amino acid sequence of SEQ ID NO: 110, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 111; i) HCDR1 comprising an amino acid sequence of SEQ ID NO: 117, HCDR2 comprising an amino acid sequence of SEQ ID NO: 118, HCDR3 comprising an amino acid sequence of SEQ ID NO: 119, LCDR1 comprising an amino acid sequence of SEQ ID NO: 122, LCDR2 comprising an amino acid sequence of SEQ ID NO: 123, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 124; j) HCDR1 comprising an amino acid sequence of SEQ ID NO: 130, HCDR2 comprising an amino acid sequence of SEQ ID NO: 131, HCDR3 comprising an amino acid sequence of SEQ ID NO: 132, LCDR1 comprising an amino acid sequence of SEQ ID NO: 135, LCDR2 comprising an amino acid sequence of SEQ ID NO: 136, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 137; k) HCDR1 comprising an amino acid sequence of SEQ ID NO: 143, HCDR2 comprising an amino acid sequence of SEQ ID NO: 144, HCDR3 comprising an amino acid sequence of SEQ ID NO: 145, LCDR1 comprising an amino acid sequence of SEQ ID NO: 148, LCDR2 comprising an amino acid sequence of SEQ ID NO: 149, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 150; l) HCDR1 comprising an amino acid sequence of SEQ ID NO: 156, HCDR2 comprising an amino acid sequence of SEQ ID NO: 157, HCDR3 comprising an amino acid sequence of SEQ ID NO: 158, LCDR1 comprising an amino acid sequence of SEQID NO: 161, LCDR2 comprising an amino acid sequence of SEQ ID NO: 162, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 163; m) HCDR1 comprising an amino acid sequence of SEQ ID NO: 169, HCDR2 comprising an amino acid sequence of SEQ ID NO: 170, HCDR3 comprising an amino acid sequence of SEQ ID NO: 171, LCDR1 comprising an amino acid sequence of SEQ ID NO: 174, LCDR2 comprising an amino acid sequence of SEQ ID NO: 175, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 176; n) HCDR1 comprising an amino acid sequence of SEQ ID NO: 182, HCDR2 comprising an amino acid sequence of SEQ ID NO: 183, HCDR3 comprising an amino acid sequence of SEQ ID NO: 184, LCDR1 comprising an amino acid sequence of SEQ ID NO: 187, LCDR2 comprising an amino acid sequence of SEQ ID NO: 188, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 189; o) HCDR1 comprising an amino acid sequence of SEQ ID NO: 195, HCDR2 comprising an amino acid sequence of SEQ ID NO: 196, HCDR3 comprising an amino acid sequence of SEQ ID NO: 197, LCDR1 comprising an amino acid sequence of SEQ ID NO: 200,

LCDR2 comprising an amino acid sequence of SEQ ID NO: 201, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 202; p) HCDR1 comprising an amino acid sequence of SEQ ID NO: 208, HCDR2 comprising an amino acid sequence of SEQ ID NO: 209, HCDR3 comprising an amino acid sequence of SEQ ID NO: 210, LCDR1 comprising an amino acid sequence of SEQ ID NO: 213, LCDR2 comprising an amino acid sequence of SEQ ID NO: 214, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 215; q) HCDR1 comprising an amino acid sequence of SEQ ID NO: 805, HCDR2 comprising an amino acid sequence of SEQ ID NO: 806, HCDR3 comprising an amino acid sequence of SEQ ID NO: 807, LCDR1 comprising an amino acid sequence of SEQ ID NO: 808, LCDR2 comprising an amino acid sequence of SEQ ID NO: 809, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 810; r) HCDR1 comprising an amino acid sequence of SEQ ID NO: 823, HCDR2 comprising an amino acid sequence of SEQ ID NO: 824, HCDR3 comprising an amino acid sequence of SEQ ID NO: 825, LCDR1 comprising an amino acid sequence of SEQ ID NO: 826, LCDR2 comprising an amino acid sequence of SEQ ID NO: 827, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 828; s) HCDR1 comprising an amino acid sequence of SEQ ID NO: 221, HCDR2 comprising an amino acid sequence of SEQ ID NO: 222, HCDR3 comprising an amino acid sequence of SEQ ID NO: 223, LCDR1 comprising an amino acid sequence of SEQ ID NO: 226, LCDR2 comprising an amino acid sequence of SEQ ID NO: 227, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 228; t) HCDR1 comprising an amino acid sequence of SEQ ID NO: 260, HCDR2 comprising an amino acid sequence of SEQ ID NO: 261, HCDR3 comprising an amino acid sequence of SEQ ID NO: 262, LCDR1 comprising an amino acid sequence of SEQ ID NO: 265, LCDR2 comprising an amino acid sequence of SEQ ID NO: 266, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 267; u) HCDR1 comprising an amino acid sequence of SEQ ID NO: 273, HCDR2 comprising an amino acid sequence of SEQ ID NO: 274, HCDR3 comprising an amino acid sequence of SEQ ID NO: 275, LCDR1 comprising an amino acid sequence of SEQ ID NO: 278, LCDR2 comprising an amino acid sequence of SEQ ID NO: 279, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 280; v) HCDR1 comprising an amino acid sequence of SEQ ID NO: 286, HCDR2 comprising an amino acid sequence of SEQ ID NO: 287, HCDR3 comprising an amino acid sequence of SEQ ID NO: 288, LCDR1 comprising an amino acid sequence of SEQ ID NO: 291, LCDR2 comprising an amino acid sequence of SEQ ID NO: 292, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 293; w) HCDR1 comprising an amino acid sequence of SEQ ID NO: 299, HCDR2 comprising an amino acid sequence of SEQ ID NO: 300, HCDR3 comprising an amino acid sequence of SEQ ID NO: 301, LCDR1 comprising an amino acid sequence of SEQ ID NO: 304, LCDR2 comprising an amino acid sequence of SEQ ID NO: 305,

and LCDR3 comprising an amino acid sequence of SEQ ID NO: 306; x) HCDR1 comprising an amino acid sequence of SEQ ID NO: 312, HCDR2 comprising an amino acid sequence of SEQ ID NO: 313, HCDR3 comprising an amino acid sequence of SEQ ID NO: 314, LCDR1 comprising an amino acid sequence of SEQ ID NO: 317, LCDR2 comprising an amino acid sequence of SEQ ID NO: 318, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 319; y) HCDR1 comprising an amino acid sequence of SEQ ID NO: 325, HCDR2 comprising an amino acid sequence of SEQ ID NO: 326, HCDR3 comprising an amino acid sequence of SEQ ID NO: 327, LCDR1 comprising an amino acid sequence of SEQ ID NO: 330, LCDR2 comprising an amino acid sequence of SEQ ID NO: 331, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 332; z) HCDR1 comprising an amino acid sequence of SEQ ID NO: 338, HCDR2 comprising an amino acid sequence of SEQ ID NO: 339, HCDR3 comprising an amino acid sequence of SEQ ID NO: 340, LCDR1 comprising an amino acid sequence of SEQ ID NO: 343, LCDR2 comprising an amino acid sequence of SEQ ID NO: 344, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 345; aa) HCDR1 comprising an amino acid sequence of SEQ ID NO: 351, HCDR2 comprising an amino acid sequence of SEQ ID NO: 352, HCDR3 comprising an amino acid sequence of SEQ ID NO: 353, LCDR1 comprising an amino acid sequence of SEQ ID NO: 356, LCDR2 comprising an amino acid sequence of SEQ ID NO: 357, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 358; bb) HCDR1 comprising an amino acid sequence of SEQ ID NO: 364, HCDR2 comprising an amino acid sequence of SEQ ID NO: 365, HCDR3 comprising an amino acid sequence of SEQ ID NO: 366, LCDR1 comprising an amino acid sequence of SEQ ID NO: 369, LCDR2 comprising an amino acid sequence of SEQ ID NO: 370, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 371; cc) HCDR1 comprising an amino acid sequence of SEQ ID NO: 377, HCDR2 comprising an amino acid sequence of SEQ ID NO: 378, HCDR3 comprising an amino acid sequence of SEQ ID NO: 379, LCDR1 comprising an amino acid sequence of SEQ ID NO: 382, LCDR2 comprising an amino acid sequence of SEQ ID NO: 383, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 384; dd) HCDR1 comprising an amino acid sequence of SEQ ID NO: 390, HCDR2 comprising an amino acid sequence of SEQ ID NO: 391, HCDR3 comprising an amino acid sequence of SEQ ID NO: 392, LCDR1 comprising an amino acid sequence of SEQ ID NO: 395, LCDR2 comprising an amino acid sequence of SEQ ID NO: 396, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 397; ee) HCDR1 comprising an amino acid sequence of SEQ ID NO: 403, HCDR2 comprising an amino acid sequence of SEQ ID NO: 404, HCDR3 comprising an amino acid sequence of SEQ ID NO: 405, LCDR1 comprising an amino acid sequence of SEQ ID NO: 408, LCDR2 comprising an amino acid sequence of SEQ ID NO: 409, and LCDR3 comprising an amino acid sequence of SEQ ID NO:

410; ff) HCDR1 comprising an amino acid sequence of SEQ ID NO: 416, HCDR2 comprising an amino acid sequence of SEQ ID NO: 417, HCDR3 comprising an amino acid sequence of SEQ ID NO: 418, LCDR1 comprising an amino acid sequence of SEQ ID NO: 421, LCDR2 comprising an amino acid sequence of SEQ ID NO: 422, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 423; gg) HCDR1 comprising an amino acid sequence of SEQ ID NO: 429, HCDR2 comprising an amino acid sequence of SEQ ID NO: 430, HCDR3 comprising an amino acid sequence of SEQ ID NO: 431, LCDR1 comprising an amino acid sequence of SEQ ID NO: 434, LCDR2 comprising an amino acid sequence of SEQ ID NO: 435, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 436; hh) HCDR1 comprising an amino acid sequence of SEQ ID NO: 442, HCDR2 comprising an amino acid sequence of SEQ ID NO: 443, HCDR3 comprising an amino acid sequence of SEQ ID NO: 444, LCDR1 comprising an amino acid sequence of SEQ ID NO: 447, LCDR2 comprising an amino acid sequence of SEQ ID NO: 448, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 449; ii) HCDR1 comprising an amino acid sequence of SEQ ID NO: 455, HCDR2 comprising an amino acid sequence of SEQ ID NO: 456, HCDR3 comprising an amino acid sequence of SEQ ID NO: 457, LCDR1 comprising an amino acid sequence of SEQ ID NO: 460, LCDR2 comprising an amino acid sequence of SEQ ID NO: 461, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 462; jj) HCDR1 comprising an amino acid sequence of SEQ ID NO: 468, HCDR2 comprising an amino acid sequence of SEQ ID NO: 469, HCDR3 comprising an amino acid sequence of SEQ ID NO: 470, LCDR1 comprising an amino acid sequence of SEQ ID NO: 473, LCDR2 comprising an amino acid sequence of SEQ ID NO: 474, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 475; kk) HCDR1 comprising an amino acid sequence of SEQ ID NO: 481, HCDR2 comprising an amino acid sequence of SEQ ID NO: 482, HCDR3 comprising an amino acid sequence of SEQ ID NO: 483, LCDR1 comprising an amino acid sequence of SEQ ID NO: 486, LCDR2 comprising an amino acid sequence of SEQ ID NO: 487, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 488; ll) HCDR1 comprising an amino acid sequence of SEQ ID NO: 494, HCDR2 comprising an amino acid sequence of SEQ ID NO: 495, HCDR3 comprising an amino acid sequence of SEQ ID NO: 496, LCDR1 comprising an amino acid sequence of SEQ ID NO: 499, LCDR2 comprising an amino acid sequence of SEQ ID NO: 500, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 501; mm) HCDR1 comprising an amino acid sequence of SEQ ID NO: 673, HCDR2 comprising an amino acid sequence of SEQ ID NO: 674, HCDR3 comprising an amino acid sequence of SEQ ID NO: 675, LCDR1 comprising an amino acid sequence of SEQ ID NO: 676, LCDR2 comprising an amino acid sequence of SEQ ID NO: 677, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 678; nn) HCDR1 comprising an amino acid sequence of SEQ ID NO:

850, HCDR2 comprising an amino acid sequence of SEQ ID NO: 851, HCDR3 comprising an amino acid sequence of SEQ ID NO: 852, LCDR1 comprising an amino acid sequence of SEQ ID NO: 853, LCDR2 comprising an amino acid sequence of SEQ ID NO: 854, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 855; oo) HCDR1 comprising an amino acid sequence of SEQ ID NO: 856, HCDR2 comprising an amino acid sequence of SEQ ID NO: 857, HCDR3 comprising an amino acid sequence of SEQ ID NO: 858, LCDR1 comprising an amino acid sequence of SEQ ID NO: 859, LCDR2 comprising an amino acid sequence of SEQ ID NO: 860, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 861; pp) HCDR1 comprising an amino acid sequence of SEQ ID NO: 862, HCDR2 comprising an amino acid sequence of SEQ ID NO: 863, HCDR3 comprising an amino acid sequence of SEQ ID NO: 864, LCDR1 comprising an amino acid sequence of SEQ ID NO: 865, LCDR2 comprising an amino acid sequence of SEQ ID NO: 866, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 867; qq) HCDR1 comprising an amino acid sequence of SEQ ID NO: 868, HCDR2 comprising an amino acid sequence of SEQ ID NO: 869, HCDR3 comprising an amino acid sequence of SEQ ID NO: 870, LCDR1 comprising an amino acid sequence of SEQ ID NO: 871, LCDR2 comprising an amino acid sequence of SEQ ID NO: 872, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 873; rr) HCDR1 comprising an amino acid sequence of SEQ ID NO: 874, HCDR2 comprising an amino acid sequence of SEQ ID NO: 875, HCDR3 comprising an amino acid sequence of SEQ ID NO: 876, LCDR1 comprising an amino acid sequence of SEQ ID NO: 877, LCDR2 comprising an amino acid sequence of SEQ ID NO: 878, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 879; or ss) HCDR1 comprising an amino acid sequence of SEQ ID NO: 880, HCDR2 comprising an amino acid sequence of SEQ ID NO: 881, HCDR3 comprising an amino acid sequence of SEQ ID NO: 882, LCDR1 comprising an amino acid sequence of SEQ ID NO: 883, LCDR2 comprising an amino acid sequence of SEQ ID NO: 884, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 885.

[0215] An antibody construct can comprise a first binding domain that specifically binds a tumor antigen. An antibody construct can comprise a first binding domain comprising one or more variable domains. An antibody construct can comprise a first binding domain comprising a light chain variable domain (V_L domain). A first binding domain can have at least 80% or 100% sequence identity to any V_L sequence in **TABLE** 2. An antibody construct can comprise a first binding domain comprising a heavy chain variable domain (V_H domain). A first binding domain can comprise at least 80% or 100% sequence identity to any V_H sequence in **TABLE** 2. A first binding domain can comprise at least 80% sequence identity to any sequence in **TABLE** 2. A

first binding domain can have a pair of V_H and V_L regions, having sequence selected from the pairs in **TABLE** 2.

[0216] An antibody construct can comprise a first binding domain that specifically binds a tumor antigen, wherein the first binding domain comprises: a) a V_H sequence having at least 80% or 100% sequence identity to an amino acid sequence of SEQ ID NO: 12, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 17; b) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 25, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 30; c) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 38, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 43; d) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 51, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 56; e) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 64, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 69; f) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 77, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 82; g) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 90, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 95; h) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 103, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 108; i) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 116, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 121; j) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 129, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 134; k) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 142, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 147; l) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 155, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 160; m) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 168, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 173; n) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 181, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 186; o) a V_H sequence having at least 80% sequence identity to an amino acid sequence

of SEQ ID NO: 194, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 199; p) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 207, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 212; q) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 811, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 812; r) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 829, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 830; s) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 220, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 225; t) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 259, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 264; u) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 272, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 277; v) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 285, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 290; w) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 298, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 303; x) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 311, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 316; y) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 324, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 328; z) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 337, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 342; aa) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 350, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 355; bb) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 363, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 368; cc) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 376, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 381; dd) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 389, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 394; ee) a V_H sequence having at least 80% sequence

identity to an amino acid sequence of SEQ ID NO: 402, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 407; ff) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 415, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 420; gg) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 428, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 433; hh) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 441, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 446; ii) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 454, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 459; jj) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 467, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 472; kk) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 480, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 485; ll) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 493, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 498; mm) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 679, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 680; nn) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 886, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 887; oo) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 888, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 889; pp) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 890, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 891; qq) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 892, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 893; rr) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 894, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO:895; ss) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 896, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 897.

[0217] An antibody construct can comprise a first binding domain and an Fc domain, wherein the first binding domain and the Fc domain comprise an antibody. A first binding domain can

specifically bind a tumor antigen. An antibody construct can comprise an antibody light chain wherein the antibody construct specifically binds to an antigen. An antibody construct can comprise a light chain comprising at least 80% or 100% sequence identity to a light chain sequence in **TABLE** 3, wherein the antibody construct specifically binds to an antigen. An antibody construct can comprise an antibody heavy chain, wherein the antibody construct specifically binds to an antigen. An antibody construct can comprise a heavy chain comprising at least 80% or 100% sequence identity to a heavy chain sequence in **TABLE 3**, wherein the antibody construct specifically binds to an antigen. An antibody construct can comprise at least 80% sequence identity to any sequence in **TABLE 3**, wherein the antibody construct specifically binds to an antigen. An antibody construct can have a pair of heavy and light chains having sequences selected from the pairs of sequences in **TABLE 3**, wherein the antibody construct specifically binds to an antigen.

[0218] An antibody construct can comprise an anti-tumor antibody, wherein the antibody comprises: a) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 11, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 16; b) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 24, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 29; c) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 37, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 42; d) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 50, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 55; e) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 63, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 68; f) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 76, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 81; g) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 89, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 94; h) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 102, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 107; i) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 115, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 120; j) a heavy chain sequence having at least 80% sequence

identity to an amino acid sequence of SEQ ID NO: 128, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 133; k) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 141, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 146; l) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 154, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 159; m) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 167, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 172; n) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 180, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 185; o) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 193, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 198; p) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 206, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 211; q) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 813, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 814; r) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 831, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 832; s) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 219, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 224; t) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 258, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 263; u) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 271, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 276; v) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 284, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 289; w) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 297, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 302; x) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 310, and a light chain sequence having at least 80% sequence identity to an amino

acid sequence of SEQ ID NO: 315; y) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 323, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 328; z) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 336, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 341; aa) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 349, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 354; bb) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 362, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 367; cc) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 375, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 380; dd) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 388, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 393; ee) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 401, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 406; ff) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 414, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 419; gg) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 427, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 432; hh) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 440, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 445; ii) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 453, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 458; jj) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 466, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 471; kk) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 479, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 484; ll) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 492, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 497; or mm) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence

of SEQ ID NO: 681, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 682.

[0219] An antibody construct can comprise a second binding domain that specifically binds to an antigen. An antibody construct can comprise a second binding domain that specifically binds to an antigen on an antigen presenting cell. An antigen presenting cell can be a dendritic cell or a macrophage. A second binding domain can specifically bind to an antigen on an immune cell such as an antigen presenting cell, wherein the molecule comprises at least 80% sequence identity to a group consisting of CD40, CD47, TNFR2, DEC-205, PD-L1, CD36 mannose scavenger receptor 1, CLEC9A, DC-SIGN, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, CD38, TREM2, CSF1R, or CD32B.

[0220] An antibody construct can further comprise an Fc domain. An antibody construct can comprise, for example, a first binding domain, a second binding domain, and an Fc domain, wherein the first binding domain is attached to the Fc domain. An antibody construct can comprise a first binding domain, a second binding domain, and an Fc domain, wherein the second binding domain is attached to the Fc domain. A first binding domain can be attached to an Fc domain as a fusion protein. A second binding domain can be attached to an Fc domain as a fusion protein. A first binding domain can be attached to an Fc domain via a linker. A second binding domain can be attached to an Fc domain via a linker.

[0221] An antibody construct can comprise a second binding domain comprising one or more CDRs. A second binding domain can comprise at least 80% sequence identity to any sequence in **TABLE 5**. A second binding domain can comprise a set of CDRs having the sequences set forth in any sete of sequence in **TABLE 5**.

[0222] An antibody construct can comprise a second binding domain that specifically binds to CD40. An antibody construct can comprise a second binding domain that is a CD40 agonist. An antibody construct can comprise a second binding domain that binds to CD40, wherein the second binding domain comprises at least 80% sequence identity to: a) HCDR1 comprising an amino acid sequence of SEQ ID NO: 3, HCDR2 comprising an amino acid sequence of SEQ ID NO: 4, HCDR3 comprising an amino acid sequence of SEQ ID NO: 5, LCDR1 comprising an amino acid sequence of SEQ ID NO: 8, LCDR2 comprising an amino acid sequence of SEQ ID NO: 9, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 10; b) HCDR1 comprising an amino acid sequence of SEQ ID NO: 582, HCDR2 comprising an amino acid sequence of SEQ ID NO: 583, HCDR3 comprising an amino acid sequence of SEQ ID NO: 584, LCDR1 comprising an amino acid sequence of SEQ ID NO: 587, LCDR2 comprising an amino acid sequence of SEQ ID NO: 588, and LCDR3 comprising an amino acid sequence of SEQ ID

NO: 589; c) HCDR1 comprising an amino acid sequence of SEQ ID NO: 592, HCDR2 comprising an amino acid sequence of SEQ ID NO: 593, HCDR3 comprising an amino acid sequence of SEQ ID NO: 594, LCDR1 comprising an amino acid sequence of SEQ ID NO: 597, LCDR2 comprising an amino acid sequence of SEQ ID NO: 598, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 599; d) HCDR1 comprising an amino acid sequence of SEQ ID NO: 602, HCDR2 comprising an amino acid sequence of SEQ ID NO: 603, HCDR3 comprising an amino acid sequence of SEQ ID NO: 604, LCDR1 comprising an amino acid sequence of SEQ ID NO: 607, LCDR2 comprising an amino acid sequence of SEQ ID NO: 608, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 609; e) HCDR1 comprising an amino acid sequence of SEQ ID NO: 612, HCDR2 comprising an amino acid sequence of SEQ ID NO: 613, HCDR3 comprising an amino acid sequence of SEQ ID NO: 614, LCDR1 comprising an amino acid sequence of SEQ ID NO: 617, LCDR2 comprising an amino acid sequence of SEQ ID NO: 618, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 619; f) HCDR1 comprising an amino acid sequence of SEQ ID NO: 622, HCDR2 comprising an amino acid sequence of SEQ ID NO: 623, HCDR3 comprising an amino acid sequence of SEQ ID NO: 624, LCDR1 comprising an amino acid sequence of SEQ ID NO: 627, LCDR2 comprising an amino acid sequence of SEQ ID NO: 628, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 629; or g) HCDR1 comprising an amino acid sequence of SEQ ID NO: 632, HCDR2 comprising an amino acid sequence of SEQ ID NO: 633, HCDR3 comprising an amino acid sequence of SEQ ID NO: 634, LCDR1 comprising an amino acid sequence of SEQ ID NO: 637, LCDR2 comprising an amino acid sequence of SEQ ID NO: 638, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 639.

[0223] An antibody construct can comprise a second binding domain that specifically binds DC-SIGN. An antibody construct can comprise a second binding domain that binds DC-SIGN, wherein the second binding domain comprises at least 80% sequence identity to: a) HCDR1 comprising an amino acid sequence of SEQ ID NO: 640, HCDR2 comprising an amino acid sequence of SEQ ID NO: 641, HCDR3 comprising an amino acid sequence of SEQ ID NO: 642, LCDR1 comprising an amino acid sequence of SEQ ID NO: 643, LCDR2 comprising an amino acid sequence of SEQ ID NO: 644, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 645; b) HCDR1 comprising an amino acid sequence of SEQ ID NO: 646, HCDR2 comprising an amino acid sequence of SEQ ID NO: 647, HCDR3 comprising an amino acid sequence of SEQ ID NO: 648, LCDR1 comprising an amino acid sequence of SEQ ID NO: 649, LCDR2 comprising an amino acid sequence of SEQ ID NO: 650, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 651; or c) HCDR1 comprising an amino acid sequence of SEQ ID NO: 652, HCDR2 comprising an amino acid sequence of SEQ ID NO: 653, HCDR3

comprising an amino acid sequence of SEQ ID NO: 654, LCDR1 comprising an amino acid sequence of SEQ ID NO: 655, LCDR2 comprising an amino acid sequence of SEQ ID NO: 656, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 657.

[0224] An antibody construct can comprise a second binding domain that specifically binds DEC-205. An antibody construct comprising a second binding domain that binds DEC-205 can comprise at least 80% sequence identity to: a) HCDR1 comprising an amino acid sequence of SEQ ID NO: 234, HCDR2 comprising an amino acid sequence of SEQ ID NO: 235, HCDR3 comprising an amino acid sequence of SEQ ID NO: 236, LCDR1 comprising an amino acid sequence of SEQ ID NO: 239, LCDR2 comprising an amino acid sequence of SEQ ID NO: 240, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 241; or b) HCDR1 comprising an amino acid sequence of SEQ ID NO: 247, HCDR2 comprising an amino acid sequence of SEQ ID NO: 248, HCDR3 comprising an amino acid sequence of SEQ ID NO: 249, LCDR1 comprising an amino acid sequence of SEQ ID NO: 252, LCDR2 comprising an amino acid sequence of SEQ ID NO: 253, and LCDR3 comprising an amino acid sequence of SEQ ID NO: 254.

[0225] An antibody construct can comprise a second binding domain comprising one or more variable domains. An antibody construct can comprise a second binding domain comprising a light chain variable domain (V_L domain). A second binding domain can comprise at least 80% sequence identity to any V_L sequence in **TABLE 6**. An antibody construct can comprise a second binding domain comprising a heavy chain variable domain. A second binding domain can comprise at least 80% sequence identity to any V_H sequence in **TABLE 6**. A second binding domain can comprise at least 80% sequence identity to any sequence in **TABLE 6**. A second binding domain can comprise at a pair of V_H and V_L domains having a pair of sequences in **TABLE 6**.

[0226] An antibody construct can comprise a second binding domain that specifically binds CD40. An antibody construct can comprise a second binding domain that is a CD40 agonist. An antibody construct can comprise a second binding domain that binds CD40, wherein the second binding domain comprises: a) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 2, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 7; b) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 581, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 586; c) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 591, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 596; d) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 601, and a V_L

sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 606; e) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 611, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 616; f) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 621, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 626; g) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 631, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 636.

[0227] An antibody construct can comprise a second binding domain that specifically binds DEC-205. An antibody construct can comprise a second binding domain that binds DEC-205, wherein the second binding domain comprises: a) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 233, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 238; or b) a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 246, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 251.

[0228] An antibody construct can comprise a second binding domain that specifically binds to CD36 mannose scavenger receptor 1. An antibody construct can comprise a second binding domain that binds CD36 mannose scavenger receptor 1, wherein the second binding domain comprises a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 658, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 659.

[0229] An antibody construct can comprise a second binding domain that specifically binds to CLEC9A. An antibody construct can comprise a second binding domain that binds CLEC9A, wherein the second binding domain comprises a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 660, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 661.

[0230] An antibody construct can comprise a second binding domain that specifically binds to PD-L1. An antibody construct can comprise a second binding domain that binds PD-L1, wherein the second binding domain comprises a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 901, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 902; or wherein the second binding domain comprises a V_H sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 890, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 891; or wherein the second binding domain comprises a V_H sequence

having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 892, and a V_L sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 893.

[0231] An antibody construct can comprise a second binding domain and an Fc domain, wherein the second binding domain and the Fc domain comprise an antibody. An antibody construct can comprise a heavy chain and a light chain that target an antigen expressed by an antigen presenting cell. An antibody construct can comprise an antibody light chain. An antibody construct can comprise a light chain comprising at least 80% sequence identity to any light chain sequence in **TABLE 7**. An antibody construct can comprise an antibody heavy chain. An antibody construct can comprise a heavy chain comprising at least 80% sequence identity to any heavy chain sequence in **TABLE 7**. An antibody construct can comprise at least 80% sequence identity to any sequence in **TABLE 7**. An antibody construct can comprise a heavy and light chains having a pair of sequences in **TABLE 7**.

[0232] An antibody construct can comprise a heavy chain and a light chain that target an antigen expressed by an antigen presenting cell. An antibody construct can comprise a first binding domain and an Fc domain, wherein the first binding domain and the Fc domain comprise an antibody. An antibody construct may comprise an anti-CD40 antibody, the antibody construct comprising: a) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 1 and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 6; b) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 577 or SEQ ID NO: 578, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 579; c) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 580, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 585; d) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 590, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 595; e) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 600, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 605; f) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 610, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 615; g) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 620, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 625; or h) a heavy chain sequence having at least 80% sequence identity to an amino acid

sequence of SEQ ID NO: 630, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 635.

[0233] An antibody construct can comprise a first binding domain and an Fc domain, wherein the first binding domain and the Fc domain comprise an antibody. An antibody construct may comprise an anti-DEC-205 antibody, the construct comprising: a) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 232, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 237; or b) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 245, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 250.

[0234] An antibody construct can comprise a first binding domain and an Fc domain, wherein the first binding domain and the Fc domain comprise an antibody. A composition may comprise an anti-CLEC12A antibody, the construct comprising: a) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 662, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 665; b) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 663, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 665; or c) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 664, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 665.

[0235] An antibody construct can comprise a first binding domain and an Fc domain, wherein the first binding domain and the Fc domain comprise an antibody. An antibody construct may comprise an anti-BDCA-2 antibody, the construct comprising: a) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 666, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 669; b) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 667, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 670; or c) a heavy chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 668, and a light chain sequence having at least 80% sequence identity to an amino acid sequence of SEQ ID NO: 671.

Antibody-ScFv Fusion Protein Products

[0236] An antibody construct can comprise a first binding domain, a second binding domain, and an Fc domain, wherein the first binding domain and the second binding domain are attached to the Fc domain. The first binding domain and the second binding domain can be attached to the Fc

domain as a fusion protein. The first binding domain can be attached to the Fc domain at an N-terminal end of the Fc domain, wherein the second binding domain can be attached to the Fc domain at a C-terminal end. The first binding domain can be attached to the Fc domain at an N-terminal end of the Fc domain, wherein the second binding domain can be attached to the Fc domain at a C-terminal end via a polypeptide linker ranging from 10 to 25 amino acids. In some embodiments, the polypeptide linker has the sequence $[G_4S]n$ where n = 2 to 5. Alternatively, the first binding domain can be attached to the Fc domain at a C-terminal end of the Fc domain, wherein the second binding domain can be attached to the Fc domain at an N-terminal end. A second binding domain and an Fc domain can comprise an antibody and a first binding domain can comprise a single chain variable fragment (scFv). A single chain variable fragment can comprise a heavy chain variable domain and a light chain variable domain of an antibody. The first binding domain of the fusion protein can be attached to the second binding domain at a heavy chain variable domain of the single chain variable fragment of the first binding domain (HL orientation). Alternatively, the first binding domain of the fusion protein can be attached to the second binding domain at a light chain variable domain of the single chain variable fragment of the first binding domain (LH orientation). In either orientation, the first binding domain and the second binding domain can be attached via a polypeptide linker varying in length from 15 to 25 amino acids. In some embodiments, the polypeptide linker has the sequence $[G_4S]n$ where n = 3 to 5.

[0237] Alternatively, an antibody construct can comprise an antibody (having two antigen binding domains and an Fc domain) and the second binding domain can comprise a single chain variable fragment (scFv). The second binding domain of the fusion protein can be attached to the first binding domain at a heavy chain variable domain of the single chain variable fragment of the first binding domain (HL orientation). Alternatively, the second binding domain of the fusion protein can be attached to the first binding domain at a light chain variable domain of the single chain variable fragment of the first binding domain (LH orientation).

[0238] An antibody construct can comprise a first binding domain and a second binding domain, wherein the second binding domain can be attached to the first binding domain. The antibody construct can comprise an antibody comprising a light chain and a heavy chain or pair of heavy and light chains. The first binding domain can comprise an Fab fragment of the light and heavy chains. The second binding domain can be attached to the light chain at a C-terminus or C-terminal end of the light chain as a fusion protein. The second binding domain can comprise a single chain variable fragment (scFv). In some embodiments, a first binding domain can be specific for any of the tumor antigens, e.g., CEA, HER2, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1,

ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, VTCN1 (B7-H4), VISTA, or gpNMB, and an scFv can be a binding domain with a specificity selected from a group consisting of antigens on antigen presenting cells, such as CD40, DEC205, and PD-L1.

[0239] An antibody construct can comprise a first binding domain, a second binding domain, and an Fc domain, wherein the first binding domain and the second binding domain are attached to the Fc domain as a fusion protein. The second binding domain of the fusion protein can specifically target an antigen with at least 80% sequence identity to CD40. The second binding domain of the fusion protein can be a CD40 agonist. The first binding domain of the fusion protein can target a tumor antigen. The construct can comprise a fusion protein comprising a heavy chain (HC) attached to a single chain variable fragment. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence in **TABLE 4**. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a heavy chain CD40 monoclonal antibody (mAb) with tumor ScFv in **TABLE 4**. The construct can comprise a fusion protein comprising at least 80% sequence identity to any sequence of a heavy chain CD40 mAb with tumor ScFv in **TABLE 4** and a light chain comprising at least 80% sequence identity to SEQ ID NO: 6. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a heavy chain tumor mAb with CD40 ScFv in **TABLE 4**. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a heavy chain tumor antigen mAb with CD40 ScFv in **TABLE 4**, and at least 80% sequence identity to a light chain mAb for the tumor antigen in **TABLE 3**.

[0240] An antibody construct can comprise a first binding domain and a second binding domain, wherein the second binding domain can be attached to the first binding domain. An antibody construct can comprise a first binding domain, a second binding domain, and an Fc domain, wherein the second binding domain can be attached to the first binding domain. The second binding domain can be attached at a C-terminal end of the first binding domain as a fusion protein. The first binding domain can comprise a Fab fragment comprising a light chain, wherein the second binding domain can be attached at a C-terminal end of the light chain as a fusion protein. The second binding domain of the fusion protein can comprise a single chain variable fragment (scFv). The second binding domain of the fusion protein can be attached to the first binding domain at a heavy chain variable domain of the single chain variable fragment of the first binding domain (HL orientation). Alternatively, the second binding domain of the fusion protein can be attached to the first binding domain at a light chain variable domain of the single chain variable fragment of the first binding domain (LH orientation). For example, a fusion protein

comprising a light chain of an anti-CEA antibody attached to an anti-CD40 scFv in the LH orientation can be illustrated by SEQ ID NO: 842. The fusion sequences comprising an scFv sequence are in the HL orientation unless indicated otherwise (e.g., sequence name recites "(LH)" indicating light heavy orientation).

[0241] The first binding domain of the fusion protein can target a tumor antigen. The second binding domain of the fusion protein can target an APC antigen. The second binding domain of the fusion protein can target CD40. The first binding domain can comprise a Fab fragment comprising a light chain, wherein the second binding domain is attached at a C-terminal end of the light chain as a fusion protein. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence in **TABLE 9**. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a light chain CD40 mAb with tumor ScFv in **TABLE 9**. The construct can comprise a fusion protein comprising at least 80% sequence identity to any sequence of a light chain CD40 mAb with tumor ScFv in **TABLE 9** and a heavy chain comprising at least 80% sequence identity to SEQ ID NO: 1. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a light chain tumor mAb with CD40 ScFv in **TABLE 9**. The construct can comprise a fusion protein comprising at least 80% sequence identity to any sequence of a light chain tumor antigen mAb with CD40 ScFv in **TABLE 9**, and at least 80% sequence identity to a heavy chain mAb for the tumor antigen in **TABLE 3**.

[0242] An antibody construct can comprise a first binding domain, a second binding domain, and an Fc domain, wherein the first binding domain and the second binding domain are attached to the Fc domain as a fusion protein. The first binding domain of the fusion protein can specifically target an antigen with at least 80% sequence identity to DEC-205. The second binding domain of the fusion protein can target a tumor antigen. The construct can comprise a fusion protein comprising a heavy chain attached to a single chain variable fragment. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence in **TABLE 8**. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a heavy chain DEC-205 mAb with tumor ScFv in **TABLE 8**. The construct can comprise a fusion protein comprising at least 80% sequence identity to any sequence of a heavy chain DEC-205 mAb with tumor ScFv in **TABLE 8** and a peptide comprising at least 80% sequence identity to SEQ ID NO: 237. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a heavy chain tumor antigen mAb with CD40 ScFv in **TABLE** 8. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a heavy chain tumor antigen mAb with CD40 ScFv in

TABLE 8, and at least 80% sequence identity to a heavy chain mAb for the tumor antigen in **TABLE 3**.

[0243] The second binding domain of the fusion protein can target DEC-205. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence in **TABLE** 10. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a light chain DEC-205 mAb with tumor ScFv in **TABLE 10**. The construct comprising a fusion protein can comprise at least 80% sequence identity to any sequence of a light chain DEC-205 mAb with tumor ScFv in **TABLE 10** and at least 80% sequence identity to SEQ ID NO: 237. The construct comprising the fusion protein can comprise at least 80% sequence identity to any sequence of a light chain tumor mAb with DEC-205 ScFv in **TABLE 10**. The construct comprising a fusion protein can comprise at least 80% sequence identity to any sequence of a light chain tumor antigen mAb with DEC-205 ScFv in **TABLE 10**, and at least 80% sequence identity to a heavy chain mAb for the tumor antigen in **TABLE 3**.

[0244] The second binding domain of the fusion protein can specifically bind to an antigen of an Antigen Presenting Cell (APC) or other immune cell. The second binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CD40. The second binding domain of the fusion protein can be a CD40 agonist. The second binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to DEC-205. The second binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to DC-SIGN. The second binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CD36 mannose scavenger receptor. The second binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CLEC12A. The second binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to BDCA-2. The second binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to PD-L1. The second binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CD40, CD47, TNFR2, DEC-205, PD-L1, CD36 mannose scavenger receptor 1, CLEC9A, DC-SIGN, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, CD38, TREM2, CSF1R, or CD32B. The first binding domain of the fusion protein can specifically bind to a tumor antigen. The first binding domain of the fusion protein can specificall bind to an antigen with at least 80% sequence identity to CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen

(PSMA), ferritin, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6, HPV E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, MYCN, RhoC, TRP-2, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, CYP1B1, PLAV1, BORIS, ETV6-AML, NY-BR-1, RGS5, SART3, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, PD-L1, VTCN1 (B7-H4), VISTA, gpNMB, or any fragment thereof.

[0245] Alternatively, the second binding domain of the fusion protein can target a tumor antigen. The second binding domain of the fusion protein can specifically bind to an antigen selected from CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6 E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, PD-L1, VTCN1 (B7-H4), VISTA, gpNMB, or any fragment thereof. The first binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CD40. The first binding

domain of the fusion protein can be a CD40 agonist. The first binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to DEC-205. The first binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CEA, HER2, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, VTCN1 (B7-H4), VISTA or gpNMB. The first binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CD40, CD47, TNFR2, DEC-205, PD-L1, CD36 mannose scavenger receptor 1, CLEC9A, DC-SIGN, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, CD38, TREM2, CSF1R, or CD32B.

[0246] An antibody construct can comprise a first binding domain, a second binding domain, and a third binding domain. An antibody construct can comprise a first binding domain, a second binding domain, a third binding domain, and an Fc domain. The first binding domain and the second binding domain can be attached to the Fc domain. The first and second binding domains are described herein throughout the specification. The first binding domain can be attached to the Fc domain at an N-terminal end of the Fc domain. The second binding domain can be attached at a C-terminal end of the Fc domain. The second binding domain can be attached at a C-terminal end of the Fc domain via a polypeptide linker having a length of 10 to 25 amino acid. In some embodiments, the polypeptide linker has the sequence $[G_4S]n$ where n = 2 to 5. The third binding domain can be attached to a C-terminal end of the first binding domain. The third binding domain can be attached at a C-terminal end of the Fc domain via a polypeptide linker having a length of 10 to 25 amino acid. In some embodiments, the polypeptide linker has the sequence $[G_4S]n$ where n = 2 to 5. The third binding domain can be attached to a C-terminal end of a light chain of the first binding domain. One or more of the first binding domain, the second binding domain, the third binding domain, and the Fc domain can be attached as a fusion protein. The first binding domain can comprise a Fab fragment comprising a light chain, wherein the second binding domain is attached at a C-terminal end of the light chain as a fusion protein. The second binding domain of the fusion protein can comprise a single chain variable fragment (scFv). The second binding domain of the fusion protein can be attached to the Fc domain at a heavy chain variable domain of the single chain variable fragment of the second binding domain (HL orientation). The second binding domain of the fusion protein can be attached to the Fc domain at a light chain variable domain of the single chain variable fragment of the second binding domain (LH orientation). The third binding domain of the fusion protein can comprise a single chain variable fragment (scFv). The antibody construct can comprise a fusion protein comprising the

third binding domain attached to the first binding domain having at least 80% sequence identity to any sequence in **TABLE 9** or **TABLE 10**. The third binding domain of the fusion protein can be attached to the first binding domain at a heavy chain variable domain of the single chain variable fragment of the first binding domain (HL orientation). Alternatively, the third binding domain of the fusion protein can be attached to the first binding domain at a light chain variable domain of the single chain variable fragment of the first binding domain (LH orientation). The third binding domain of the fusion protein can target an antigen of an immune cell, such as an antigen presenting cell (APC). The third binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CD40. The third binding domain of the fusion protein can be a CD40 agonist. The third binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to DEC-205. The third binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CD40, CD47, TNFR2, DEC-205, PD-L1, CD36 mannose scavenger receptor 1, CLEC9A, DC-SIGN, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, CD38, TREM2, CSF1R, or CD32B.

[0247] Alternatively, the third binding domain can target a tumor antigen. The third binding domain of the fusion protein can specifically bind to an antigen with at least 80% sequence identity to CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6, HPV E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, MYCN, RhoC, TRP-2, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, CYP1B1, PLAV1, BORIS, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, PAGE4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, VTCN1 (B7-H4), VISTA, gpNMB, or any fragment thereof. In additional embodiments, the

third binding domain of the fusion protein can specifically bind to an antigen selected from CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6 E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, PAGE4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, VTCN1 (B7-H4), VISTA, gpNMB, or any fragment thereof.

[0248] An antibody construct can comprise a first binding domain targeting CD40 and a second binding domain targeting DEC-205. Alternatively, an antibody construct can comprise a first binding domain targeting DEC-205 and a second binding domain targeting CD40. An antibody construct can comprise a first binding domain, a second binding domain, and an Fc domain. The first binding domain and the second binding domain can be attached to the Fc domain. The first binding domain can be attached to the Fc domain at an N-terminal end of the Fc domain, wherein the second binding domain is attached to the Fc domain at a C-terminal end of the Fc domain. Alternatively, the second binding domain can be attached to the Fc domain at an N-terminal end of the Fc domain, wherein the first binding domain is attached to the Fc domain at a C-terminal end of the Fc domain. An antibody construct can comprise a fusion protein comprising a first binding domain targeting CD40 and a second binding domain targeting DEC-205. The fusion protein can comprise at least 80% sequence identity to any sequence in TABLE 11.

[0249] Additionally, antibody constucts expressing proteins having the sequences referenced in Tables 1-11 can have a dissociation constant (K_d) that is less than 10 nM for the antigen of the first binding domain. The antibody constructs expressing proteins having the sequences referenced in Tables 1-11 can have a dissociation constant (K_d) that is less than 10 nM for the

antigen of the second binding domain. The antibody constructs expressing the sequences referenced in Tables 1-11 can have a dissociation constant (K_d) that is less than 10 nM for the antigen of the third binding domain. The antibody constructs can have a dissociation constant (K_d) for the antigen of the first binding domain that is less than 1 nM, less than 100 pM, less than 10 pM, less than 1 pM, or less than 0.1 pM. The antibody constructs can have a dissociation constant (K_d) for the antigen of the second binding domain that is less than 1 nM, less than 100 pM, less than 10 pM, less than 1 pM, or less than 0.1 pM. The antibody constructs can have a dissociation constant (K_d) for the antigen of the third binding domain that is less than 1 nM, less than 100 pM, less than 10 pM, less than 1 pM, or less than 0.1 pM.

[0250] An anti-CD40 light chain can be expressed with an anti-CD40 heavy chain or fragment thereof, wherein the light and heavy chains specifically bind to CD40. The anti-CD40 light chain can also be expressed with an anti-CD40 heavy chain or fragment thereof to form an anti-CD40 antibody or fragment thereof, wherein the antibody or antibody fragment specifically binds to CD40. The anti-CD40 antibody or fragment thereof can be purified, and can be combined with a pharmaceutically acceptable carrier.

[0251] An anti-DEC-205 light chain can be expressed with any anti-DEC-205 heavy chain or fragment thereof, wherein the light and heavy chains specifically bind to DEC-205. The anti-DEC-205 light chain can also be expressed with an anti-DEC-205 heavy chain or fragment thereof to form an anti-DEC-205 antibody or fragment thereof, wherein the antibody or antibody fragment specifically binds to DEC-205. The anti-DEC-205 antibody or fragment thereof can be purified, and can be combined with a pharmaceutically acceptable carrier.

[0252] An anti-PD-L1 light chain can be expressed with any anti-PD-L1 heavy chain or fragment thereof, wherein the light and heavy chains specifically bind to PD-L1. The anti-PD-L1 light chain can also be expressed with an anti-PD-L1 heavy chain or fragment thereof to form an anti-PD-L1 antibody or fragment thereof, wherein the antibody or antibody fragment specifically binds to PD-L1. The anti-PD-L1 antibody or fragment thereof can be purified, and can be combined with a pharmaceutically acceptable carrier.

[0253] An anti-tumor antigen light chain can be expressed with any anti-tumor antigen heavy chain or fragment thereof, wherein the antibody or antibody fragment specifically binds to tumor antigen. The anti-tumor antigen light chain can also expressed with any anti-tumor antigen heavy chain or fragment thereof to form an anti-tumor antigen antibody or fragment thereof. The anti-tumor antibody or fragment thereof can be purified, and can be combined with a pharmaceutically acceptable carrier.

[0254] An antibody construct can comprise an antibody heavy chain. A heavy chain can be a heavy chain of an anti-CD40 antibody which can bind a CD40 antigen. A heavy chain of an anti-

CD40 antibody can be an IgG1 isotype. A heavy chain of an anti-CD40 antibody can be dacetuzumab.

[0255] An antibody construct can comprise an antibody light chain. A light chain can be a light chain of an anti-CD40 antibody which can bind a CD40 antigen. A light chain of an anti-CD40 antibody can be dacetuzumab.

[0256] An antibody construct can comprise an antibody heavy chain. A heavy chain can be a heavy chain of an anti-CD40 antibody which can bind a CD40 antigen. A heavy chain of an anti-CD40 antibody can be an IgG4 isotype. A heavy chain of an anti-CD40 antibody can be bleselumab.

[0257] An antibody construct can comprise an antibody light chain. A light chain can be a light chain of an anti-CD40 antibody which can bind a CD40 antigen. A light chain of an anti-CD40 antibody can be bleselumab.

[0258] An antibody constructcan comprise an antibody heavy chain. A heavy chain can be a heavy chain of an anti-CD40 antibody which can bind a CD40 antigen. A heavy chain of an anti-CD40 antibody can be an IgG1 isotype. A heavy chain of an anti-CD40 antibody can be lucatumumab.

[0259] An antibody construct can comprise an antibody light chain. A light chain can be a light chain of an anti-CD40 antibody which can bind a CD40 antigen. A light chain of an anti-CD40 antibody can be lucatumumab.

[0260] An antibody construct can comprise an antibody heavy chain. A heavy chain can be a heavy chain of an anti-CD40 antibody which can bind a CD40 antigen. A heavy chain of an anti-CD40 antibody can be an IgG1 isotype. A heavy chain of an anti-CD40 antibody can be ADC-1013.

[0261] An antibody construct can comprise an antibody light chain. A light chain can be a light chain of an anti-CD40 antibody which can bind a CD40 antigen. A light chain of an anti-CD40 antibody can be ADC-1013.

[0262] An antibody construct can comprise an antibody heavy chain. A heavy chain can be a heavy chain of an anti-CD40 antibody which can bind a CD40 antigen. A heavy chain of an anti-CD40 antibody can be the humanized rabbit antibody APX005.

[0263] An antibody construct can comprise an antibody light chain. A light chain can be a light chain of an anti-CD40 antibody which can bind a CD40 antigen. A light chain of an anti-CD40 antibody can be the humanized rabbit antibody APX005.

[0264] An antibody construct can comprise an antibody heavy chain. A heavy chain can be a heavy chain of an anti-CD40 antibody which can bind a CD40 antigen. A heavy chain of an anti-CD40 antibody can be Chi Lob 7/4.

[0265] An antibody construct can comprise an antibody light chain. A light chain can be a light chain of an anti-CD40 antibody which can bind a CD40 antigen. A light chain of an anti-CD40 antibody can be Chi Lob 7/4.

[0266] An antibody construct can comprise an antibody heavy chain. A heavy chain can be a heavy chain of an anti-CD40 antibody which can bind a CD40 antigen. A heavy chain of an anti-CD40 antibody can be an IgG1 isotype. A heavy chain of an anti-CD40 antibody can be SBT-040-G1WT.

[0267] An antibody construct can comprise an antibody heavy chain. A heavy chain can be a heavy chain of an anti-CD40 antibody which can bind a CD40 antigen. A heavy chain of an anti-CD40 antibody can be an IgG1 isotype. A heavy chain of an anti-CD40 antibody can be SBT-040 VH-hIgG1 wt.

[0268] A heavy chain of an anti-CD40 antibody can be an IgG2 isotype. A heavy chain of an anti-CD40 antibody can be SBT-040-G2.

[0269] An antibody construct can comprise an antibody with modifications occurring at least at one amino acid residue. Modifications can be substitutions, additions, mutations, deletions, or the like. An antibody modification can be an insertion of an unnatural amino acid.

[0270] An antibody construct can comprise a light chain of an amino acid sequence having at least one, two, three, four, five, six, seven, eight, nine, or ten modifications but not more than 40, 35, 30, 25, 20, 15, or 10 modifications of the amino acid sequence relative to the natural or original amino acid sequence. An antibody construct can comprise a heavy chain with an amino acid sequence having at least one, two, three, four, five, six, seven, eight, nine or ten modifications but not more than 40, 35, 30, 25, 20, 15, or 10 modifications of the amino acid sequence relative to the natural or original amino acid sequence.

[0271] An antibody construct can have an Fc domain of an IgG1 isotype. An antibody construct can have an Fc domain of an IgG2 isotype. An antibody construct can have an Fc domain of an IgG3 isotype. An antibody construct can have an Fc domainof an IgG4 isotype. An antibody construct can have an Fc domain of a hybrid isotype comprising constant regions from two or more isotypes. An antibody construct can be an anti-CD40 antibody, in which the anti-CD40 antibody can be a monoclonal human antibody comprising a wild-type sequence of an IgG1 isoform, in particular, at an Fc region of the antibody.

[0272] An antibody constructs disclosed herein can be non-natural, designed, and/or engineered. Antibody constructs disclosed herein can be non-natural, designed, and/or engineered scaffolds comprising an antigen binding domain. Antibody constructs disclosed herein can be non-natural, designed, and/or engineered antibodies. Antibody constructs can be monoclonal antibodies. Antibody constructs can be human antibodies. Antibody constructs can be humanized antibodies.

Antibody constructs can be monoclonal humanized antibodies. Antibody construct can be recombinant antibodies.

[0273] The K_d for binding of the Fc domain to an Fc receptor of an antibody construct as described herein can increase when the tumor antigen binding domain is bound to its tumor antigen as compared to the K_d for binding of the Fc domain to an Fc receptor of a construct as described herein when the tumor antigen binding domain is not bound to its tumor antigen. For example, an antibody construct as described herein can have a K_d for binding of the Fc domain to an Fc receptor in the presence of the binding domain that binds to an antigen on an immune cell, such as an antigen presenting cell, and the tumor target binding domain when the tumor target binding domain is bound to its tumor antigen that can be greater than or greater than about 100 nM. The K_d for binding of the Fc domain to an Fc receptor in the presence of the binding domain that binds to an antigen on an immune cell, such as an antigen presenting cell, and the tumor target binding domain when the tumor target binding domain is bound to its tumor antigen can be or can be about 100 nM, 200 nM, 300 nM, 400 nM, 500 nM, or 1000 nM. The K_d for binding of the Fc domain to an Fc receptor in the presence of the binding domain that binds to an antigen on an immune cell, such as an antigen presenting cell, and the tumor target binding domain when the tumor target binding domain is bound to its tumor antigen can be from 100 nM to 200 nM, 100 nM to 300 nM, 100 nM to 400 nM, 100 nM to 500 nM, or 100 nM to 1000 nM. Additionally, the antibody construct as described herein can have a K_d for binding of the Fc domain to an Fc receptor in the presence of the binding domain that binds to an antigen on an immune cell, such as an antigen presenting cell, and a tumor antigen binding domain when the tumor antigen binding domain is not bound to the tumor antigen is no greater than about 100 nM and is no greater than about 100 times a K_d for binding of the Fc domain to the Fc receptor in an absence of the binding domain that binds to an antigen on an immune cell and a tumor antigen binding domain.

[0274] The K_d for binding of the binding domain of an antibody construct as described herein that binds to an antigen on an immune cell, such as an antigen presenting cell, can increase when the tumor antigen binding domain is bound to its tumor antigen as compared to the K_d for binding of the binding domain that binds to an antigen on an immune cell when the tumor antigen binding domain is not bound to its tumor antigen. For example, an antibody construct can comprise a K_d for binding of the binding domain that binds to an antigen on an antigen presenting cell when the tumor antigen binding domain is bound to its tumor antigen can be greater than or greater than about 100nM. The K_d for binding of the binding domain that binds to an antigen on an immune cell, such as an antigen presenting cell, when the tumor antigen binding domain is bound to its tumor antigen can be or can be about 100 nM, 200 nM, 300 nM, 400 nM,

500 nM, or 1000 nM. K_d for binding of the binding domain that binds to an antigen on an immune cell when the tumor antigen binding domain is bound to its tumor antigen can be from 100 nM to 200 nM, 100 nM to 300 nM, 100 nM to 400 nM, 100 nM to 500 nM, or 100 nM to 1000 nM.

[0275] The effect of the tumor antigen binding domain and the binding domain that binds to an antigen on the immune cell together can be to cluster the antibody constructs or conjugates on cells expressing tumor antigen, and thus clustering immune cells such as antigen presenting cells around cancerous cells and at tumor sites resulting in activation of the antigen presenting cell effector functions. This can include the activation of the antigen on the antigen presenting cell when a an antibody construct is bound to its antigen, such as activation of CD40, CD47, TNFR2, DEC-205, PD-L1, CD36 mannose scavenger receptor 1, DC-SIGN, CLEC9A, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, CD38, TREM2, CSF1R, or CD32B. In some embodiments, this activation of the antigen on the antigen presenting cell only occurs when the tumor targeting antibody construct is bound to its tumor antigen. An antigen presenting cell effector function can include antibody dependent cellular cytotoxicity (ADCC) of the tumor antigen expressing cell, which can occur when a bispecific tumor targeting antibody construct is bound to its tumor antigen. In some embodiments, ADCC of the tumor antigen expressing cell only occurs with a bispecific tumor targeting antibody construct is bound to its tumor antigen. In certain embodiments, a bispecific tumor targeting antibody construct density of greater than 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, 10,000 or more per cell, resulting from the bispecific tumor targeting antibody construct binding to the tumor antigen, induces signaling in the antigen presenting cell. Signaling can suitably be measured in vitro using a cell line expressing the tumor antigen bound by the target antigen binding domain, and primary antigen presenting cells isolated from a human subject. Signaling can be assessed as cytokine release, chemokine release, or increased expression of cell surface markers. In certain embodiments, a bispecific tumor targeting antibody construct density of greater than 1000, 2000, 3000, 4000, 5000, 6000, 7000, 8000, 9000, 10,000 or more per cell, resulting from the bispecific tumor targeting antibody construct binding to the tumor antigen, induces ADCC of the cells expressing tumor antigen. ADCC can suitably be measured in vitro using a cell line expressing the tumor antigen bound by the target antigen binding domain, and cells such as NK cells and/or macrophages isolated from a human subject. ADCC can be determined by the frequency of remaining tumor antigen expressing cells in the co-culture.

[0276] In some embodiments, the antibody constructs as described herein can specifically bind to a tumor antigen in a cluster of constructs or conjugates, and this clustering can induce a signal in

an antigen presenting cell. The constructs as described herein can specifically bind to a tumor antigen in a cluster of constructs, and this clustering can induce antibody dependent cellular cytotoxicity. The constructs as described herein can specifically bind to a tumor antigen in a cluster of constructs and this clustering can result in an increased avidity for an antigen on an antigen presenting cell. The antibody constructs as described herein can specifically bind to a tumor antigen in a cluster of constructs and this clustering can result in an increased avidity of the Fc domain for an Fc receptor.

[0277] Sequences that can be used to produce antibodies for antibody constructs can include leader sequences. Leader sequences can include signal sequences. Leader sequences useful with the antibody construct and methods described herein can include, but are not limited to, an amino acid sequence comprising MRLPAQLLGLLLLWFPGSRC (SEQ ID NO: 847), MDWTWRILFLVAAATGAHS (SEQ ID NO: 848), and MRAWIFFLLCLAGRALA (SEQ ID NO: 849).

[0278] An antibody construct can comprise an Fc region with an Fc domain. An Fc domain is a structure that can bind to Fc receptors. An antibody construct can comprise an Fc domain. Fc domains can be bound by Fc receptors (FcRs). Fc domains can be from antibodies. An Fc domain can be at least 80% homologous to an Fc domain from an antibody. An Fc region can be in a scaffold. An Fc region with an Fc domain can be in an antibody scaffold. An Fc region with an Fc domain can be in a non-antibody scaffold. An antibody construct can comprise an Fc region with an Fc domain in an antibody scaffold. An antibody construct can comprise an Fc region with an Fc domain in a non-antibody scaffold. An Fc domain can be in a scaffold. An Fc domain can be in an antibody scaffold. An Fc domain can be in a non-antibody scaffold. An antibody construct can comprise an Fc domain in an antibody scaffold. An antibody construct can comprise an Fc domain in a non-antibody scaffold. Fc domains of antibodies, including those of the present disclosure, can be bound by Fc receptors (FcRs). An Fc domain can be a portion of the Fc region of an antibody. FcRs can bind to an Fc domain of an antibody. FcRs can bind to an Fc domain of an antibody bound to an antigen. FcRs are organized into classes (*e.g.*, gamma (γ), alpha (α) and epsilon (ε)) based on the class of antibody that the FcR recognizes. The FcαR class can bind to IgA and includes several isoforms, FcαRI (CD89) and FcαμR. The FcγR class can bind to IgG and includes several isoforms, FcγRI (CD64), FcγRIIA (CD32a), FcγRIIB (CD32b), FcγRIIIA (CD16a), and FcγRIIIB (CD16b). An FcγRIIIA (CD16a) can be an FcγRIIIA (CD16a) F158 variant. An FcγRIIIA (CD16a) can be an FcγRIIIA (CD16a) V158 variant. Each FcγR isoform can differ in affinity to the Fc region of the IgG antibody. For example, FcγRI can bind to IgG with greater affinity than FcγRII or FcγRIII. The affinity of a particular FcγR isoform to IgG can be controlled, in part, by a glycan (e.g., oligosacccharide) at position CH_2 84.4 of the

IgG antibody. For example, fucose containing CH_2 84.4 glycans can reduce IgG affinity for FcγRIIIA. In addition, G0 glucans can have increased affinity for FcγRIIIA due to the lack of galactose and terminal GlcNAc moiety.

[0279] Binding of an Fc domain to an FcR can enhance an immune response. FcR-mediated signaling that can result from an Fc region binding to an FcR can lead to the maturation of immune cells. FcR-mediated signaling that can result from an Fc domain binding to an FcR can lead to the maturation of dendritic cells. FcR-mediated signaling that can result from an Fc domain binding to an FcR can lead to antibody dependent cellular cytotoxicity. FcR-mediated signaling that can result from an Fc domain binding to an FcR can lead to more efficient immune cell antigen uptake and processing. FcR-mediated signaling that can result from an Fc region binding to an FcR can lead to more efficient dendritic cell antigen uptake and processing. FcR-mediated signaling that can result from an Fc region binding to an FcR can increase antigen presentation. FcR-mediated signaling that can result from an Fc region binding to an FcR can increase antigen presentation by immune cells. FcR-mediated signaling that can result from an Fc region binding to an FcR can increase antigen presentation by antigen presenting cells. FcR-mediated signaling that can result from an Fc domain binding to an FcR can increase antigen presentation by dendritic cells. FcR-mediated signaling that can result from an Fc domain binding to an FcR can promote the expansion and activation of T cells. FcR-mediated signaling that can result from an Fc domain binding to an FcR can promote the expansion and activation of $CD8^+$ T cells. FcR-mediated signaling that can result from an Fc domain binding to an FcR can influence immune cell regulation of T cell responses. FcR-mediated signaling that can result from an Fc domain binding to an FcR can influence immune cell regulation of T cell responses. FcR-mediated signaling that can result from an Fc domain binding to an FcR can influence dendritic cell regulation of T cell responses. FcR-mediated signaling that can result from an Fc domain binding to an FcR can influence functional polarization of T cells (e.g., polarization can be toward a T_H1 cell response).

[0280] The profile of FcRs on a dendritic cell (DC) can impact the ability of the DC to respond upon stimulation. For example, most DC can express both CD32A and CD32B, which can have opposing effects on IgG-mediated maturation and function of DCs: binding of IgG to CD32A can mature and activate DCs in contrast with CD32B, which can mediate inhibition due to phosphorylation of immunoreceptor tyrosine-based inhibition motif (ITIM), after CD32B binding of IgG. Therefore, the activity of these two receptors can establish a threshold of DC activation. Furthermore, the difference in functional avidity of these receptors for IgG can shift their functional balance. Hence, altering the Fc domain binding to FcRs can also shift their functional

balance, allowing for manipulation (either enhanced activity or enhanced inhibition) of the DC immune response.

[0281] A modification in the amino acid sequence of the Fc domain of an antibody construct can alter the recognition of an FcR for the Fc domain. However, such modifications can still allow for FcR-mediated signaling. A modification can be a substitution of an amino acid at a residue (e.g., wildtype) for a different amino acid at that residue. A modification can permit binding of an FcR to a site on the Fc domain or region that the FcR may not otherwise bind to. A modification can increase the binding affinity of an FcR to the Fc domain that the FcR may have reduced binding affinity for. A modification can decrease binding affinity of an FcR to a site on the Fc domain that the FcR may have increased binding affinity for. A modification can increase the subsequent FcR-mediated signaling after Fc binding to an FcR.

[0282] An antibody construct can comprise an Fc region with at least one amino acid change as compared to the sequence of the wild-type Fc region. An antibody construct can comprise an Fc domain with at least one amino acid change as compared to the sequence of the wild-type Fc domain. An amino acid change in an Fc region can allow the construct to bind to at least one Fc receptor with greater affinity compared to a wild-type Fc region. An amino acid change in an Fc domain can allow the antibody construct to bind to at least one Fc receptor with greater affinity compared to a wild-type Fc domain. An Fc region can comprise an amino acid sequence having at least one, two, three, four, five, six, seven, eight, nine or ten modifications but not more than 40, 35, 30, 25, 20, 15, or 10 modifications of the amino acid sequence relative to the natural or original amino acid sequence. An Fc domain can comprise an amino acid sequence having at least one, two, three, four, five, six, seven, eight, nine or ten modifications but not more than 40, 35, 30, 25, 20, 15, or 10 modifications of the amino acid sequence relative to the natural or original amino acid sequence. An Fc region can be an Fc region of an IgG1 antibody. An Fc region can contain an Fc domain. An Fc region can be an Fc domain.

[0283] An antibody construct can be an antibody comprising a sequence of the IgG1 isoform that has been modified from the wildtype IgG1 sequence. A modification can comprise a substitution at more than one amino acid residue such as at 5 different amino acid residues including L235V/F243L/R292P/Y300L/P396L (IgG1VLPLL). The numbering of amino acids residues is according to the EU index of Kabat. The 5 amino acid residues can be located in a portion of an antibody sequence which can encode an Fc region of the antibody and in particular, can be located in portions of the Fc region that can bind to Fc receptors (i.e., the Fc domain). A modification can comprise a substitution at more than one amino acid residue such as at 3 different amino acid residues including S298A/E333A/K334A (IgG1AAA), according to the EU index of Kabat. The 3 amino acid residues can be located in a portion of an antibody sequence

which can encode an Fc region of the antibody and in particular, can be located in portions of the Fc region that can bind Fc receptors (i.e., the Fc domain).

[0284] In some embodiments, the Fc domain or region can comprise a sequence of an IgG isoform that has been modified from the wild-type IgG sequence. In some embodiments, the Fc domain or region can comprise a sequence of the IgG1 isoform that has been modified from the wild-type IgG1 sequence. In some embodiments, the modification comprises substitution of one or more amino acids that reduce binding affinity of an IgG Fc domain or region to all Fcγ receptors. A modification can be substitution of E233, L234 and L235, such as E233P/L234V/L235A or E233P/L234V/L235A/ΔG236, according to the EU index of Kabat. A modification can be substitution of L235, F243, R292, Y300 and P396, such as L235V/F243L/R292P/Y300L/P396L (IgG1VLPLL) according to the EU index of Kabat. A modification can be a substitution of P238, such as P238A, according to the EU index of Kabat. A modification can be a substitution of D265, such as D265A, according to the EU index of Kabat. A modification can be a substitution of N297, such as N297A, according to the EU index of Kabat. A modification can be a substitution of A327, such as A327Q, according to the EU index of Kabat. A modification can be a substitution of P329, such as P239A, according to the EU index of Kabat.

[0285] In some embodiments, an IgG Fc domain or region comprises at least one amino acid substitution that reduces its binding affinity to FcγR1, as compared to a wild-type or reference IgG Fc domain. A modification can comprise a substitution at F241, such as F241A, according to the EU index of Kabat. A modification can comprise a substitution at F243, such as F243A, according to the EU index of Kabat. A modification can comprise a substitution at V264, such as V264A, according to the EU index of Kabat. A modification can comprise a substitution at D265, such as D265A according to the EU index of Kabat.

[0286] In some embodiments, an IgG Fc domain or region comprises at least one amino acid substitution that increases its binding affinity to FcγR1, as compared to a wild-type or reference IgG Fc domain. A modification can comprise a substitution at A327 and P329, such as A327Q/P329A, according to the EU index of Kabat.

[0287] In some embodiments, the modification comprises substitution of one or more amino acids that reduce binding affinity of an IgG Fc domain or region to FcγRII and FcγRIIIA receptors. A modification can be a substitution of D270, such as D270A, according to the EU index of Kabat. A modification can be a substitution of Q295, such as Q295A, according to the EU index of Kabat. A modification can be a substitution of A327, such as A237S, according to the EU index of Kabat.

[0288] In some embodiments, the modification comprises substitution of one or more amino acids that increases binding affinity of an IgG Fc domain or region to FcγRII and FcγRIIIA receptors. A modification can be a substitution of T256, such as T256A, according to the EU index of Kabat. A modification can be a substitution of K290, such as K290A, according to the EU index of Kabat.

[0289] In some embodiments, the modification comprises substitution of one or more amino acids that increases binding affinity of an IgG Fc domain or region to FcγRII receptor. A modification can be a substitution of R255, such as R255A, according to the EU index of Kabat. A modification can be a substitution of E258, such as E258A, according to the EU index of Kabat. A modification can be a substitution of S267, such as S267A, according to the EU index of Kabat. A modification can be a substitution of E272, such as E272A, according to the EU index of Kabat. A modification can be a substitution of N276, such as N276A, according to the EU index of Kabat. A modification can be a substitution of D280, such as D280A, according to the EU index of Kabat. A modification can be a substitution of H285, such as H285A, according to the EU index of Kabat. A modification can be a substitution of N286, such as N286A, according to the EU index of Kabat. A modification can be a substitution of T307, such as T307A, according to the EU index of Kabat. A modification can be a substitution of L309, such as L309A, according to the EU index of Kabat. A modification can be a substitution of N315, such as N315A, according to the EU index of Kabat. A modification can be a substitution of K326, such as K326A, according to the EU index of Kabat. A modification can be a substitution of P331, such as P331A, according to the EU index of Kabat. A modification can be a substitution of S337, such as S337A, according to the EU index of Kabat. A modification can be a substitution of A378, such as A378A, according to the EU index of Kabat. A modification can be a substitution of E430, such as E430, according to the EU index of Kabat.

[0290] In some embodiments, the modification comprises substitution of one or more amino acids that increases binding affinity of an IgG Fc domain or region to FcγRII receptor and reduces the binding affinity to FcγRIIIA receptor. A modification can be a substitution of H268, such as H268A, according to the EU index of Kabat. A modification can be a substitution of R301, such as R301A, according to the EU index of Kabat. A modification can be a substitution of K322, such as K322A, according to the EU index of Kabat.

[0291] In some embodiments, the modification comprises substitution of one or more amino acids that decreases binding affinity of an IgG Fc domain or region to FcγRII receptor but does not affect the binding affinity to FcγRIIIA receptor. A modification can be a substitution of R292, such as R292A, according to the EU index of Kabat. A modification can be a substitution of K414, such as K414A, according to the EU index of Kabat.

[0292] In some embodiments, the modification comprises substitution of one or more amino acids that decreases binding affinity of an IgG Fc domain or region to FcγRII receptor and increases the binding affinity to FcγRIIIA receptor. A modification can be a substitution of S298, such as S298A, according to the EU index of Kabat. A modification can be substitution of S239, I332 and A330, such as S239D/I332E/A330L. A modification can be substitution of S239 and I332, such as S239D/I332E.

[0293] In some embodiments, the modification comprises substitution of one or more amino acids that decreases binding affinity of an IgG Fc domain or region to FcγRIIIA receptor and does not affect the binding affinity to FcγRII receptor. A modification can be a substitution of S239, such as S239A, according to the EU index of Kabat. A modification can be a substitution of E269, such as E269A, according to the EU index of Kabat. A modification can be a substitution of E293, such as E293A, according to the EU index of Kabat. A modification can be a substitution of Y296, such as Y296F, according to the EU index of Kabat. A modification can be a substitution of V303, such as V303A, according to the EU index of Kabat. A modification can be a substitution of A327, such as A327G, according to the EU index of Kabat. A modification can be a substitution of K338, such as K338A, according to the EU index of Kabat. A modification can be a substitution of D376, such as D376A, according to the EU index of Kabat.

[0294] In some embodiments, the modification comprises substitution of one or more amino acids that increases binding affinity of an IgG Fc domain or region to FcγRIIIA receptor and does not affect the binding affinity to FcγRII receptor. A modification can be a substitution of E333, such as E333A, according to the EU index of Kabat. A modification can be a substitution of K334, such as K334A, according to the EU index of Kabat. A modification can be a substitution of A339, such as A339T, according to the EU index of Kabat. A modification can be substitution of S239 and I332, such as S239D/I332E.

[0295] In some embodiments, an IgG Fc domain or region comprises at least one amino acid substitution that reduces the binding affinity to FcRn, as compared to a wild-type or reference IgG Fc domain. A modification can comprise a substitution at H435, such as H435A according to the EU index of Kabat. A modification can comprise a substitution at I253, such as I253A according to the EU index of Kabat. A modification can comprise a substitution at H310, such as H310A according to the EU index of Kabat. A modification can comprise substitutions at I253, H310 and H435, such as I253A/H310A/H435A according to the EU index of Kabat.

[0296] A modification can comprise a substitution of one amino acid residue that increases the binding affinity of an IgG Fc domain for FcRn, relative to a wildtype or reference IgG Fc domain. A modification can comprise a substitution at V308, such as V308P according to the

EU index of Kabat. A modification can comprise a substitution at M428, such as M428L according to the EU index of Kabat. A modification can comprise a substitution at N434, such as N434A according to the EU index of Kabat or N434H according to the EU index of Kabat. A modification can comprise substitutions at T250 and M428, such as T250Q and M428L according to the EU index of Kabat. A modification can comprise substitutions at M428 and N434, such as M428L and N434S, N434A or N434H according to the EU index of Kabat. A modification can comprise substitutions at M252, S254 and T256, such as M252Y/S254T/T256E according to the EU index of Kabat. A modification can be a substitution of one or more amino acids selected from P257L, P257N, P257I, V279E, V279Q, V279Y, A281S, E283F, V284E, L306Y, T307V, V308F, Q311V, D376V, and N434H. Other substitutions in an IgG Fc domain that affect its interaction with FcRn are disclosed in U.S. Patent No. 9,803,023 (the disclosure of which is incorporated by reference herein).

[0297] An antibody construct can be a monoclonal anti-CD40 human antibody comprising a sequence of the IgG1 isoform that has been modified from the wildtype IgG1 sequence. A modification can comprise a substitution at more than one amino acid residue such as at 5 different amino acid residues including L235V/F243L/R292P/Y300L/P396L (SBT-040-G1VLPLL). The numbering of amino acids residues is according to the EU index. The 5 amino acid residues can be located in a portion of an antibody sequence which can encode an Fc region of the antibody and in particular, can be located in portions of the Fc region that can bind to Fc receptors (i.e., the Fc domain). A modification can comprise a substitution at more than one amino acid residue such as at 3 different amino acid residues including S298A/E333A/K334A (SBT-040-G1AAA). The 3 amino acid residues can be located in a portion of an antibody sequence which can encode an Fc region of the antibody and in particular, can be located in portions of the Fc region that can bind Fc receptors (i.e., the Fc domain).

[0298] Binding of Fc receptors to an Fc region can be affected by amino acid substitutions. For example, SBT-040-VLPLL is an antibody with an amino acid sequence of a heavy chain of human anti-CD40 monoclonal antibody with modifications to a wild-type IgG1 Fc domain (L235V/F243L/R292P/Y300L/P396L). Binding of some Fc receptors to the Fc region of SBT-040-VLPLL can be enhanced compared to wild-type by as result of the L235V/F243L/R292P/Y300L/P396L amino acid modifications. However, binding of other Fc receptors to the Fc region of SBT-040-VLPLL can be reduced compared to wild-type by the L235V/F243L/R292P/Y300L/P396L amino acid modifications. For example, the binding affinities of SBT-040-VLPLLto FcγRIIIA and to FcγRIIA can be enhanced compared to wild-type whereas the binding affinity of SBT-040-VLPLL to FcγRIIB can be reduced compared to wild-type. Binding of Fc receptors to an Fc region of are affected by amino acid substitutions.

SBT-040-G1AAA antibody is an antibody with an amino acid sequence of a heavy chain of a human anti-CD40 monoclonal antibody with modifications to a wild-type IgG1 Fc domain (S298A/E333A/K334A). Binding of Fc receptors to an Fc region of SBT-040-G1AAA can be enhanced compared to wild-type as a result of the S298A/E333A/K334A amino acid modification. However, binding of some Fc receptors to the Fc region of SBT-040-G1AAA can be reduced compared to wild-type by S298A/E333A/K334A amino acid modification. Binding affinities of SBT-040-G1AAA to FcγRIIIA can be enhanced compared to wild-type whereas the binding affinity of SBT-040-G1AAA to FcγRIIB can be reduced compared to wildtype.

[0299] In some embodiments, the heavy chain of a human IgG2 antibody can be mutated at cysteines as positions 127, 232, or 233. In some embodiments, the light chain of a human IgG2 antibody can be mutated at a cysteine at position 214. The mutations in the heavy and light chains of the human IgG2 antibody can be from a cysteine residue to a serine residue.

[0300] While an antibody construct of the present disclosure can comprise a first binding domain and a second binding domain (or, in some cases, a third binding domain) with wild-type or modified amino acid sequences encoding the Fc region or Fc domain, the modifications of the Fc region or the Fc domain from the wild-type sequence may not significantly alter binding and/or affinity of the binding domains. For example, binding and/or affinity of an antibody constructcomprising a first binding domain and a second binding domain (or, in some cases, a third binding domain) and having the Fc domain modifications of SBT-040-G1WT, SBT-040-G1VLPLL, or SBT-040-G1AAA may not be significantly altered by modification of an Fc region or Fc domain amino acid sequence compared to a wild-type sequence. Modifications of an Fc region or Fc domain from a wild-type sequence may not alter binding and/or affinity of a first binding domain that binds, for example, to CD40 or DEC-205. Additionally, the binding and/or affinity of the binding domains described herein, for example, a first binding domain, a second binding domain (or, in some cases, a third binding domain), and an Fc domain modification selected from SBT-040-G1WT, SBT-040-G1VLPLL, and SBT-040-G1AAA, may be comparable to the binding and/or affinity of wild-type antibodies.

[0301] In some embodiments, the binding profile of the Fc domain for Fcγ receptors can be retained in the antibody construct or conjugate, which can allow for delivery of the antibody construct or conjugate into immune cell types comprising the Fcγ receptors and can further immune activation by Fcγ receptor signaling. In some embodiments, APCs can be activated by an antibody construct or conjugate as described herein when the antibody construct or conjugate is bound to a tumor cell, undergoes Fcγ receptor mediated uptake, or undergoes Fcγ receptor mediated Antibody Dependent Cellular Phagocytosis (ADCP). In some embodiments, the antibody construct or conjugate can retain weak or no Fcγ receptor binding to allow for maximal

immune activation or decreased toxicity of the immune-stimulatory compound due to the primary delivery of the antibody construct or conjugate into tumor cells by antibody antigen mediated endocytosis.

[0302] In some embodiments, the antibody construct or conjugate can comprise an IgG1 Fc domain variant comprising N297A, N297G, K322A/L234A/L235A, or L234F/L235E/P331S, and lacks binding to an Fcγ receptor but can retain binding to FcRN in the presence of the immune-modulatory compound to allow for lower delivery of the conjugate into tumor cells or immune cells.

[0303] In some embodiments, an antibody construct or conjugate can comprise an Fc domain with higher affinity to one or more Fcγ receptors, which can result in greater immune activation than for an antibody construct or conjugate with an Fc domain that can bind to one or more Fcγ receptors with lower affinity.

TABLE 1. Tumor Antibody CDRs

Antibody	Region	SEQ ID NO:	Sequence
Pertuzumab	HCDR1	13	GFTFTDYT
	HCDR2	14	VNPNSGGS
	HCDR3	15	ARNLGPSFYFDY
	LCDR1	18	QDVSIG
	LCDR2	19	SAS
	LCDR3	20	QQYYIYPYT
Cetuximab	HCDR1	26	GFSLTNYG
	HCDR2	27	IWSGGNT
	HCDR3	28	ARALTYYDYEFAY
	LCDR1	31	QSIGTN
	LCDR2	32	YAS
	LCDR3	33	QQNNNWPTT
Panitumumab	HCDR1	39	GGSVSSGDYY
	HCDR2	40	IYYSGNT
	HCDR3	41	VRDRVTGAFDI
	LCDR1	44	QDISNY
	LCDR2	45	DAS
	LCDR3	46	QHFDHLPLA
Nimotuzumab	HCDR1	52	GYTFTNYY
	HCDR2	53	INPTSGGS
	HCDR3	54	ARQGLWFDSDGRGFDF
	LCDR1	57	QNIVHSNGNTY
	LCDR2	58	KVS
	LCDR3	59	FQYSHVPWT
Zalutumumab	HCDR1	65	GFTFSTYG
	HCDR2	66	IWDDGSYK
	HCDR3	67	ARDGITMVRGVMKDYFDY
	LCDR1	70	QDISSA
	LCDR2	71	DAS
	LCDR3	72	QQFNSYPLT
Onartuzumab	HCDR1	78	GYTFTSYW
	HCDR2	79	IDPSNSDT
	HCDR3	80	ATYRSYVTPLDY
	LCDR1	83	QSLLYTSSQKNY
	LCDR2	84	WAS

Antibody	Region	SEQ ID NO:	Sequence
	LCDR3	85	QQYYAYPWT
Patritumab	HCDR1	91	GGSFSGYY
	HCDR2	92	INHSGST
	HCDR3	93	ARDKWTWYFDL
	LCDR1	96	QSVLYSSSNRNY
	LCDR2	97	WAS
	LCDR3	98	QQYYSTPRT
Clivatuzumab	HCDR1	104	GYTFPSYV
	HCDR2	105	INPYNDGT
	HCDR3	106	ARGFGGSYGFAY
	LCDR1	109	SSVSSSY
	LCDR2	110	STS
	LCDR3	111	HQWNRYPYT
Sofituzumab	HCDR1	117	GYSITNDYA
	HCDR2	118	ISYSGYT
	HCDR3	119	ARWT SGLDY
	LCDR1	122	DLIHNW
	LCDR2	123	GAT
	LCDR3	124	QQYWTTPFT
Edrecolomab	HCDR1	130	GYAFTNYL
	HCDR2	131	INPGSGGT
	HCDR3	132	ARDGPWFAY
	LCDR1	135	ENVVTY
	LCDR2	136	GAS
	LCDR3	137	GQGYSYPYT
Adecatumumab	HCDR1	143	GFTFSSYG
	HCDR2	144	ISYDGSNK
	HCDR3	145	AKDMGWGSGWRPYYYYGMDV
	LCDR1	148	QSISSY
	LCDR2	149	WAS
	LCDR3	150	QQSYDIPYT
Anetumab	HCDR1	156	GYSFTSYW
	HCDR2	157	IDPGDSRT
	HCDR3	158	ARGQLYGGTYMDG
	LCDR1	161	SSDIGGYNS
	LCDR2	162	GVN
	LCDR3	163	SSYDIESATPV
huDS6	HCDR1	169	GYTFTSYN
	HCDR2	170	IYPGNGAT
	HCDR3	171	ARGDSVPFAY
	LCDR1	174	SSVSF
	LCDR2	175	STS
	LCDR3	176	QQRSSFPLT
Lifastuzumab	HCDR1	182	GFSFSDFA
	HCDR2	183	IGRVAFHT
	HCDR3	184	ARHRGFDVGHFDF
	LCDR1	187	ETLV HSSGNTY
	LCDR2	188	RVS
	LCDR3	189	FQGSFNPLT
Sacituzumab	HCDR1	195	GYTFTNYG
	HCDR2	196	INTYTGEP
	HCDR3	197	ARGGFGSSYWYFDV
	LCDR1	200	QDVSIA
	LCDR2	201	SAS
	LCDR3	202	QQHYITPLT
PR1A3	HCDR1	208	GYTFTEFG
	HCDR2	209	INTKTGEA
	HCDR3	210	ARWDFYDYVEAMDY

Antibody	Region	SEQ ID NO:	Sequence
	LCDR1	213	QNVGTN
	LCDR2	214	SAS
	LCDR3	215	HQYYTYPLFT
Humanized PR1A3	HCDR1	805	GYTFTEFG
	HCDR2	806	INTKTGEA
	HCDR3	807	ARWDFAYYVEAMDY
	LCDR1	808	AAVGTY
	LCDR2	809	SAS
	LCDR3	810	HQYYTYPLFT
Humanized Ab2-3	HCDR1	823	GFVFSSYD
	HCDR2	824	YISSGGGIT
	HCDR3	825	AAHYFGSSGPFAY
	LCDR1	826	ENIFSY
	LCDR2	827	NTR
	LCDR3	828	QHHYGTPFT
IMAB362, CLAUDIXIMAB	HCDR1	221	GYTFTSYW
	HCDR2	222	IYPSDSYT
	HCDR3	223	TRSWRGNSFDY
	LCDR1	226	QSLLNSGNQKNY
	LCDR2	227	WAS
	LCDR3	228	QNDYSYPFT
AMG595	HCDR1	260	GFTFRNYG
	HCDR2	261	IWYDGSDK
	HCDR3	262	ARDGYDILTGNPRDFDY
	LCDR1	265	QSLVHSDGNTY
	LCDR2	266	RIS
	LCDR3	267	MQSTHVPRT
ABT806	HCDR1	273	GYSISRDFA
	HCDR2	274	ISYNGNT
	HCDR3	275	VTASRGFPY
	LCDR1	278	QDINSN
	LCDR2	279	HGT
	LCDR3	280	VQYAQFPWT
Sibrotuzumab	HCDR1	286	RYTFTEYT
	HCDR2	287	INPNNGIP
	HCDR3	288	ARRRIAYGYDEGHAMDY
	LCDR1	291	QSLLYSRNQKNY
	LCDR2	292	WAS
	LCDR3	293	QQYFSYPLT
DS-8895a variant 1	HCDR1	299	GYTFIDYS
	HCDR2	300	INTYTGEP
	HCDR3	301	ATYYRYERDFDY
	LCDR1	304	QSIVHSSGITY
	LCDR2	305	KVS
	LCDR3	306	FQGSHVPYT
DS-8895a variant 2	HCDR1	312	GYTFIDYS
	HCDR2	313	INTYTGEP
	HCDR3	314	ATYYRYERDFDY
	LCDR1	317	QSIVHSSGITY
	LCDR2	318	KVS
	LCDR3	319	FQGSHVPYT
MEDI-547	HCDR1	325	GFTFSHYM
	HCDR2	326	IGPSGGPT
	HCDR3	327	AGYDSGYDYVAVAGPAEYFQH
	LCDR1	330	QSISTW
	LCDR2	331	KAS
	LCDR3	332	QQYNSYSRT
Narnatumab	HCDR1	338	GFTFSSYL

Antibody	Region	SEQ ID NO:	Sequence
	HCDR2	339	IKQDGSEK
	HCDR3	340	TRDGYSSGRHYGMDV
	LCDR1	343	QSVSRY
	LCDR2	344	DAS
	LCDR3	345	QQRSNWPRT
RG7841	HCDR1	351	GFSLTGYS
	HCDR2	352	IWGDGST
	HCDR3	353	ARDYYFNYASWFAY
	LCDR1	356	QGISNYL
	LCDR2	357	YTS
	LCDR3	358	QQYSELPWT
Farletuzumab	HCDR1	364	GFTFSGYG
	HCDR2	365	ISSGGSYT
	HCDR3	366	ARHGDDPAWFAY
	LCDR1	369	SSISSNN
	LCDR2	370	GTS
	LCDR3	371	QQWSSYPYMYT
Mirvetuximab	HCDR1	377	GYTFTGYF
	HCDR2	378	IHPYDGDT
	HCDR3	379	TRYDGSRAMDY
	LCDR1	382	QSVSFAGTSL
	LCDR2	383	RAS
	LCDR3	384	QQSREYPYT
J591 variant 1	HCDR1	390	GYTFTEYT
	HCDR2	391	INPNNGGT
	HCDR3	392	AAGWNFDY
	LCDR1	395	QDVGTA
	LCDR2	396	WAS
	LCDR3	397	QQYNSYPLT
J591 variant 2	HCDR1	403	GYTFTEYT
	HCDR2	404	INPNNGGT
	HCDR3	405	AAGWNFDY
	LCDR1	408	ENVVTY
	LCDR2	409	GAS
	LCDR3	410	GQGYSYPYT
Rovalpituzumab	HCDR1	416	GYTFTNYG
	HCDR2	417	INTYTGEP
	HCDR3	418	ARIGDSSPSDY
	LCDR1	421	QSVSND
	LCDR2	422	YAS
	LCDR3	423	QQDYTSPWT
PF-06647020	HCDR1	429	GYTFTDYA
	HCDR2	430	ISTYNDYT
	HCDR3	431	ARGNSYFYALDY
	LCDR1	434	ESVDSYGKSF
	LCDR2	435	RAS
	LCDR3	436	QQSNEDPWT
Antibody to PTK7	HCDR1	442	GFTFSSYA
	HCDR2	443	ISYDGSIK
	HCDR3	444	ARTYYFDY
	LCDR1	447	QSIGSS
	LCDR2	448	YAS
	LCDR3	449	HQSSSLPIT
Ladiratuzumab	HCDR1	455	GLTIEDYY
	HCDR2	456	IDPENGDT
	HCDR3	457	AVHNAHYGTWFAY
	LCDR1	460	QSLLHSSGNTY
	LCDR2	461	KIS

Antibody	Region	SEQ ID NO:	Sequence
	LCDR3	462	FQGSHVPYT
Cirmtuzumab	HCDR1	468	GYAFTAYN
	HCDR2	469	FDPYDGGS
	HCDR3	470	ARGWYYFDY
	LCDR1	473	KSISKY
	LCDR2	474	SGS
	LCDR3	475	QQHDESPYT
Antibody to MAGE-A3	HCDR1	481	GFRFRSHG
	HCDR2	482	SYDGNNK
	HCDR3	483	ASPYTSDWQYFQY
	LCDR1	486	QNISTT
	LCDR2	487	DTS
	LCDR3	488	QQSNSWPLT
Antibody to NY-ESO-1	HCDR1	494	GFSFIDYG
	HCDR2	495	MNWSGDKK
	HCDR3	496	ARGEYSNRFDP
	LCDR1	499	QSLVFTDGNTY
	LCDR2	500	KVS
	LCDR3	501	MQGTHWPPI
Trastuzumab	HCDR1	673	GFNIKDTY
	HCDR2	674	IYPTNGYT
	HCDR3	675	SRWGGDGFYAMDY
	LCDR1	676	QDVNTA
	LCDR2	677	SAS
	LCDR3	678	QQHYTTPPT
Ipilumumab	HCDR1	850	GFTFSSYT
	HCDR2	851	ISYDGNNK
	HCDR3	852	ARTGWLGPFDY
	LCDR1	853	QSVGSSY
	LCDR2	854	SSY
	LCDR3	855	QQYGSSPWT
Vonlerolizumab	HCDR1	856	GYTFTDSY
	HCDR2	857	MYPDNGDS
	HCDR3	858	VLAPRWYFSV
	LCDR1	859	QDISNY
	LCDR2	860	YTS
	LCDR3	861	QQGHTLPPT
Anti-CD27 Antibody	HCDR1	862	GFTFSSYD
	HCDR2	863	IWYDGSNK
	HCDR3	864	ARGSGNWGFFDY
	LCDR1	865	QGISRW
	LCDR2	866	AAS
	LCDR3	867	QQYNTYPRT
Atezolizumab	HCDR1	868	GFTFSDSW
	HCDR2	869	ISPYGGST
	HCDR3	870	ARRHWPGGFDY
	LCDR1	871	QDVSTA
	LCDR2	872	SAS
	LCDR3	873	QQYLYHPAT
Durvalumab	HCDR1	874	GFTFSRYW
	HCDR2	875	IKQDGSEK
	HCDR3	876	AREGGWFGELAFDY
	LCDR1	877	QRVSSSY
	LCDR2	878	DAS
	LCDR3	879	QQYGSLPWT
MDX-1106	HCDR1	880	GDTFSTYA
	HCDR2	881	IIPIFGKA
	HCDR3	882	ARKFHFVSGSPFGMDV

Antibody	Region	SEQ ID NO:	Sequence
	LCDR1	883	QSVSSY
	LCDR2	884	DAS
	LCDR3	885	QQRSNWPT

TABLE 2. Tumor Antibody V_H sequences and V_L sequences

Antibody	Region	SEQ ID NO:	Sequence
Pertuzumab	V_H	12	EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVA DVNPNSGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARN LGPSFYFDYWGQGTLVTVSS
	V_L	17	DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSAS YRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFGQGTKV EIK
Cetuximab	V_H	25	QVQLKQSGPGLVQPSQSLSITCTVSGFSLTNYGVHWVRQSPGKGLEWLGVI WSGGNTDYNTPFTSRLSINKDNSKSQVFFKMNSLQSNDTAIYYCARALTYY DYEFAYWGQGTLVTVSA
	V_L	30	DILLTQSPVILSVSPGERVSFSCRASQSIGTNIHWYQQRTNGSPRLLIKYASES ISGIPSRFSGSGSGTDFTLSINSVESEDIADYYCQQNNNWPTTFGAGTKLELK
Panitumumab	V_H	38	QVQLQESGPGLVKPSETLSLTCTVSGGSVSSGDYYWTWIRQSPGKGLEWIG HIYYSGNTNYNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAIYYCVRDRVTG AFDIWGQGTMVTVSS
	V_L	43	DIQMTQSPSSLSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKLLIYDA SNLETGVPSRFSGSGSGTDFTFTISSLQPEDIATYFCQHFDHLPLAFGGGTKV EIK
Nimotuzumab	V_H	51	QVQLQQSGAEVKKPGSSVKVSCKASGYTFTNYYIYWVRQAPGQGLEWIG GINPTSGGSNFNEKFKTRVTITVDESTNTAYMELSSLRSEDTAFYFCARQGL WFDSDGRGFDFWGQGSTVTVSS
	V_L	56	DIQMTQSPSSLSASVGDRVTITCRSSQNIVHSNGNTYLDWYQQTPGKAPKL LIYKVSNRFSGVPSRFSGSGSGTDFTFTISSLQPEDIATYYCFQYSHVPWTFG QGTKLEIK
Zalutumumab	V_H	64	QVQLVESGGGVVQPGRSLRLSCAASGFTFSTYGMHWVRQAPGKGLEWVA VIWDDGSYKYYGDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DGITMVRGVMKDYFDYWGQGTLVTVSS
	V_L	69	AIQLTQSPSSLSASVGDRVTITCRASQDISSALVWYQQKPGKAPKLLIYDAS SLESGVPSRFSGSESGTDFTLTISSLQPEDFATYYCQQFNSYPLTFGGGTKVE IK
Onartuzumab	V_H	77	EVQLVESGGGLVQPGGSLRLSCAASGYTFTSYWLHWVRQAPGKGLEWVG MIDPSNSDTRFNPNFKDRFTISADTSKNTAYLQMNSLRAEDTAVYYCATYR SYVTPLDYWGQGTLVTVSS
	V_L	82	DIQMTQSPSSLSASVGDRVTITCKSSQSLLYTSSQKNYLAWYQQKPGKAPK LLIYWASTRESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYAYPWT FGQGTKVEIK
Patritumab	V_H	90	QVQLQQWGAGLLKPSETLSLTCAVYGGSFSGYYWSWIRQPPGKGLEWIGE INHSGSTNYNPSLKSRVTISVETSKNQFSLKLSSVTAADTAVYYCARDKWT WYFDLWGRGTLVTVSS

Antibody	Region	SEQ ID NO:	Sequence
	V_L	95	DIEMTQSPDSLAVSLGERATINCRSSQSVLYSSSNRNYLAWYQQNPGQPPK LLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQQYYSTPRT FGQGTKVEIK
Clivatuzumab	V_H	103	QVQLQQSGAEVKKFGASVKVSCEASGYTFPSYVLHWVKQAPGQGLEWIG YINPYNDGTQTNKKFKGKATLTRDTSINTAYMELSRLRSDDTAVYYCARG FGGSYGFAYNGQGTLVTVSS
	V_L	108	DIQLTQSPSSLSASVGDRVTMTCSASSSVSSSYLYWYQQKPGKAPKLWIYS TSNLASGVPARFSGSGSGTDFTLTISSLQPEDSASYFCHQWNRYPYTFGGGT RLEIK
Sofituzumab	V_H	116	EVQLVESGGGLVQPGGSLRLSCAASGYSITNDYAWNWVRQAPGKGLEWV GYISYSGYTTYNPSLKSRFTISRDTSKNTLYLQMNSLRAEDTAVYYCARWT SGLDYWGQGTLVTVSS
	V_L	121	DIQMTQSPSSLSASVGDRVTITCKASDLIHNWLAWYQQKPGKAPKLLIYGA TSLETGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYWTTPFTFGQGTK VEIK
Edrecolomab	V_H	129	QVQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWVKQRPGQGLEWIGV INPGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSAVYFCARDGP WFAYWGQGTLVTVSA
	V_L	134	NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLIYG ASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSYPYTFGGG TKLEIK
Adecatumumab	V_H	142	EVQLLESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVA VISYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAKD MGWGSGWRPYYYYGMDVWGQGTTVTVSS
	V_L	147	ELQMTQSPSSLSASVGDRVTITCRTSQSISSYLNWYQQKPGQPPKLLIYWAS TRESGVPDRFSGSGSGTDFTLTISSLQPEDSATYYCQQSYDIPYTFGQGTKLE IK
Anetumab	V_H	155	QVELVQSGAEVKKPGESLKISCKGSGYSFTSYWIGWVRQAPGKGLEWMGII DPGDSRTRYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCARGQLY GGGTYMDGWGQGTLVTVSS
	V_L	160	DIALTQPASVSGSPGQSITISCTGTSSDIGGYNSVSWYQQHPGKAPKLMIYG VNNRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYCSSYDIESATPVFGG GTKLTVL
huDS6	V_H	168	QAQLVQSGAEVVKPGASVKMSCKASGYTFTSYNMHWVKQTPGQGLEWIG YIYPGNGATNYNQKFQGKATLTADPSSSTAYMQISSLTSEDSAVYFCARGD SVPFAYWGQGTLVTVSA
	V_L	173	EIVLTQSPATMSASPGERVTITCSAHSSVSFMHWFQQKPGTSPKLWIYSTSS LASGVPARFGGSGSGTSYSLTISSMEAEDAATYYCQQRSSFPLTFGAGTKLE LK
Lifastuzumab	V_H	181	EVQLVESGGGLVQPGGSLRLSCAASGFSFSDFAMSWVRQAPGKGLEWVAT IGRVAFHTYYPDSMKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARHR GFDVGHFDFWGQGTLVTVSS
	V_L	186	DIQMTQSPSSLSASVGDRVTITCRSSETLVHSSGNTYLEWYQQKPGKAPKL

Antibody	Region	SEQ ID NO:	Sequence
			LIYRVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCFQGSFNPLTFG QGTKVEIK
Sacituzumab	V_H	194	QVQLQQSGSELKKPGASVKVSCKASGYTFTNYGMNWVKQAPGQGLKWM GWINTYTGEPTYTDDFKGRFAFSLDTSVSTAYLQISSLKADDTAVYFCARG GFGSSYWYFDVWGQGSLVTVSS
	V_L	199	DIQLTQSPSSLSASVGDRVSITCKASQDVSIAVAWYQQKPGKAPKLLIYSAS YRYTGVPDRFSGSGSGTDFTLTISSLQPEDFAVYYCQQHYITPLTFGAGTKV EIK
PR1A3	V_H	207	QVKLQQSGPELKKPGETVKISCKASGYTFTEFGMNWVKQAPGKGLKWMG WINTKTGEATYVEEFKGRFAFSLETSATTAYLQINNLKNEDTAKYFCARW DFYDYVEAMDYWGQGTTVTVSS
	V_L	212	DIVMTQSQRFMSTSVGDRVSVTCKASQNVGTNVAWYQQKPGQSPKALIYS ASYRYSGVPDRFTGSGSGTDFTLTISNVQSEDLAEYFCHQYYTYPLFTFGSG TKLEMK
Humanized PR1A3	V_H	811	QVQLVQSGAEVKKPGASVKVSCKASGYTFTEFGMNWVRQAPGQGLEWM GWINTKTGEATYVEEFKGRVTFTTDTSTSTAYMELRSLRSDDTAVYYCAR WDFAYYVEAMDYWGQGTTVTVSS
	V_L	812	DIQMTQSPSSLSASVGDRVTITCKASAAVGTYVAWYQQKPGKAPKLLIYSA SYRKRGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCHQYYTYPLFTFGQGT KLEIK
Humanized Ab2-3	V_H	829	EVQLQESGPGLVKPGGSLSLSCAASGFVFSSYDMSWVRQTPERGLEWVAYI SSGGGITYAPSTVKGRFTVSRDNAKNTLYLQMNSLTSEDTAVYYCAAHYF GSSGPFAYWGQGTLVTVSS
	V_L	830	DIQMTQSPASLSASVGDRVTITCRASENIFSYLAWYQQKPGKSPKLLVYNT RTLAEGVPSRFSGSGSGTDFSLTISSLQPEDFATYYCQHHYGTPFTFGSGTKL EIK
IMAB362, CLAUDIXIMAB	V_H	220	QVQLQQPGAELVRPGASVKLSCKASGYTFTSYWINWVKQRPGQGLEWIGN IYPSDSYTNYNQKFKDKATLTVDKSSSTAYMQLSSPTSEDSAVYYCTRSWR GNSFDYWGQGTTLTVSS
	V_L	225	DIVMTQSPSSLTVTAGEKVTMSCKSSQSLLNSGNQKNYLTWYQQKPGQPP KLLIYWASTRESGVPDRFTGSGSGTDFTLTISSVQAEDLAVYYCQNDYSYPF TFGSGTKLEIK
AMG595	V_H	259	QVQLVESGGGVVQSGRSLRLSCAASGFTFRNYGMHWVRQAPGKGLEWVA VIWYDGSDKYYADSVRGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARD GYDILTGNPRDFDYWGQGTLVTVSS
	V_L	264	DTVMTQTPLSSHVTLGQPASISCRSSQSLVHSDGNTYLSWLQQRPGQPPRL LIYRISRRFSGVPDRFSGSGAGTDFTLEISRVEAEDVGVYYCMQSTHVPRTF GQGTKVEIK
ABT806	V_H	272	EVQLQESGPGLVKPSQTLSLTCTVSGYSISRDFAWNWIRQPPGKGLEWMG YISYNGNTRYQPSLKSRITISRDTSKNQFFLKLNSVTAADTATYYCVTASRG FPYWGQGTLVTVSS
	V_L	277	DIQMTQSPSSMSVSVGDRVTITCHSSQDINSNIGWLQQKPGKSFKGLIYHGT NLDDGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCVQYAQFPWTFGGGTK LEIK
Sibrotuzumab	V_H	285	QVQLVQSGAEVKKPGASVKVSCKTSRYTFTEYTIHWVRQAPGQRLEWIGG INPNNGIPNYNQKFKGRVTITVDTSASTAYMELSSLRSEDTAVYYCARRRIA YGYDEGHAMDYWGQGTLVTVSS
	V_L	290	DIVMTQSPDSLAVSLGERATINCKSSQSLLYSRNQKNYLAWYQQKPGQPPK LLIFWASTRESGVPDRFSGSGFGTDFTLTISSLQAEDVAVYYCQQYFSYPLT

Antibody	Region	SEQ ID NO:	Sequence
			FGQGTKVEIK
DS-8895a variant 1	V_H	298	QVQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLEWM GWINTYTGEPTYSDDFKGRVTITADTSTSTAYLELSSLRSEDTAVYYCATY YRYERDFDYWGQGTLVTVSS
	V_L	303	DIVMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLIY KVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGQ GTKVEIK
DS-8895a variant 2	V_H	311	QIQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLKWMG WINTYTGEPTYSDDFKGRFAFSLDTSTSTAYLELSSLRSEDTAVYYCATYY RYERDFDYWGQGTLVTVSS
	V_L	316	DVLMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLI YKVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFG QGTKVEIK
MEDI-547	V_H	324	EVQLLESGGGLVQPGGSLRLSCAASGFTFSHYMMAWVRQAPGKGLEWVS RIGPSGGPTHYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAGY DSGYDYVAVAGPAEYFQHWGQGTLVTVSS
	V_L	329	DIQMTQSPSSLSASVGDRVTITCRASQSISTWLAWYQQKPGKAPKLLIYKAS NLHTGVPSRFSGSGSGTEFSLTISGLQPDDFATYYCQQYNSYSRTFGQGTKV EIK
Narnatumab	V_H	337	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYLMTWVRQAPGKGLEWVA NIKQDGSEKYYVDSVKGRFTISRDNAKNSLNLQMNSLRAEDTAVYYCTRD GYSSGRHYGMDVWGQGTTVIVSS
	V_L	342	EIVLTQSPATLSLSPGERATLSCRASQSVSRYLAWYQQKPGQAPRLLIYDAS NRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSNWPRTFGQGTKV EIK
RG7841	V_H	350	EVQLVESGPALVKPTQTLTLTCTVSGFSLTGYSVNWIRQPPGKALEWLGMI WGDGSTDYNSALKSRLTISKDTSKNQVVLTMTNMDPVDTATYYCARDYY FNYASWFAYWGQGTLVTVSS
	V_L	355	DIQMTQSPSSLSASVGDRVTITCSASQGISNYLNWYQQKPGKTVKLLIYYTS NLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQYSELPWTFGQGTKV EIK
Farletuzumab	V_H	363	EVQLVESGGGVVQPGRSLRLSCSASGFTFSGYGLSWVRQAPGKGLEWVA MISSGGSYTYYADSVKGRFAISRDNAKNTLFLQMDSLRPEDTGVYFCARH GDDPAWFAYWGQGTPVTVSS
	V_L	368	DIQLTQSPSSLSASVGDRVTITCSVSSSISSNNLHWYQQKPGKAPKPWIYGTS NLASGVPSRFSGSGSGTDYTFTISSLQPEDIATYYCQQWSSYPYMYTFGQGT KVEIK
Mirvetuximab	V_H	376	QVQLVQSGAEVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSLEWIGR IHPYDGDTFYNQKFQGKATLTVDKSSNTAHMELLSLTSEDFAVYYCTRYD GSRAMDYWGQGTTVTVSS
	V_L	381	DIVLTQSPLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPGQQPRLLI YRASNLEAGVPDRFSGSGSKTDFTLTISPVEAEDAATYYCQQSREYPYTFG GGTKLEIK

Antibody	Region	SEQ ID NO:	Sequence
J591 variant 1	V_H	389	EVQLQQSGPELKKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNIN PNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWNF DYWGQGTTLTVSS
	V_L	394	DIVMTQSHKFMSTSVGDRVSIICKASQDVGTAVDWYQQKPGQSPKLLIYW ASTRHTGVPDRFTGSGSGTDFTLTITNVQSEDLADYFCQQYNSYPLTFGAG TMLDLK
J591 variant 2	V_H	402	EVQLQQSGPELVKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNIN PNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWNF DYWGQGTTLTVSS
	V_L	407	NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLIYG ASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSYPYTFGGG TKLEIK
Rovalpituzumab	V_H	415	QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQGLEWM GWINTYTGEPTYADDFKGRVTMTTDTSTSTAYMELRSLRSDDTAVYYCAR IGDSSPSDYWGQGTLVTVSS
	V_L	420	EIVMTQSPATLSVSPGERATLSCKASQSVSNDVVWYQQKPGQAPRLLIYYA SNRYTGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQDYTSPWTFGQGTK LEIK
PF-06647020	V_H	428	QVQLVQSGPEVKKPGASVKVSCKASGYTFTDYAVHWVRQAPGKRLEWIG VISTYNDYTYNNQDFKGRVTMTRDTSASTAYMELSRLRSEDTAVYYCARG NSYFYALDYWGQGTSVTVSS
	V_L	433	EIVLTQSPATLSLSPGERATLSCRASESVDSYGKSFMHWYQQKPGQAPRLLI YRASNLESGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQSNEDPWTFGG GTKLEIK
Antibody to PTK7	V_H	441	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYAFHWVRQAPGKGLEWVA VISYDGSIKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARTY YFDYWGQGTLVTVSS
	V_L	446	EIVLTQSPDFQSVTPKEKVTITCRASQSIGSSLHWYQQKPDQSPKLLIKYASQ SFSGVPSRFSGSGSGTDFTLTINSLEAEDAAAYYCHQSSSLPITFGQGTRLEI K
Ladiratuxumab	V_H	454	QVQLVQSGAEVKKPGASVKVSCKASGLTIEDYYMHWVRQAPGQGLEWM GWIDPENGDTEYGPKFQGRVTMTRDTSINTAYMELSRLRSDDTAVYYCAV HNAHYGTWFAYWGQGTLVTVSS
	V_L	459	DVVMTQSPLSLPVTLGQPASISCRSSQSLLHSSGNTYLEYFQQRPGQSPRPLI YKISTRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGG GTKVEIK
Cirmtuzumab	V_H	467	QVQLQESGPGLVKPSQTLSLTCTVSGYAFTAYNIHWVRQAPGQGLEWMGS FDPYDGGSSYNQKFKDRLTISKDTSKNQVVLTMTNMDPVDTATYYCARG WYYFDYWGHGTLVTVSS
	V_L	472	DIVMTQTPLSLPVTPGEPASISCRASKSISKYLAWYQQKPGQAPRLLIYSGST LQSGIPPRFSGSGYGTDFTLTINNIESEDAAYYFCQQHDESPYTFGEGTKVEI K
Antibody to MAGE-A3	V_H	480	QVQLVESGGGVVQPGRSLRLSCTASGFRFRSHGMHWVRQAPGKGLEWVA VISYDGNNKLYADSVKGRITISRDNSKNTLFLQMNNVRAEDTAVYYCASP YTSDWQYFQYWGQGTLVIVSS

Antibody	Region	SEQ ID NO:	Sequence
	V_L	485	EIVMTQSPATLSVSPGERATFSCRASQNISTTLAWYQQKPGQAPRLLIYDTS TRATGIPARFSGSGSGTEFTLTISSLQSEDLAVYYCQQSNSWPLTFGGGTKV EIK
Antibody to NY-ESO-1	V_H	493	QVQLVQSGGGVVRPGGSLRLSCAASGFSFIDYGMSWVRQVPGKGLEWVA GMNWSGDKKGHAESVKGRFIISRDNAKNTLYLEMSSLRVEDTALYFCARG EYSNRFDPRGRGTLVTVSS
	V_L	498	DIVMTQTPLSLPVTLGQPASLSCRSSQSLVFTDGNTYLNWFQQRPGQSPRRL IYKVSSRDPGVPDRFSGTGSGTDFTLEISRVEAEDIGVYYCMQGTHWPPIFG QGTKVEIK
Trastuzumab	V_H	679	EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVAR IYPTNGYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWG GDGFYAMDYWGQGTLVTVSS
	V_L	680	DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSA SFLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKV EIK
Vonlerolizumab	V_H	886	EVQLVQSGAEVKKPGASVKVSCKASGYTFTDSYMSWVRQAPGQGLEWIG DMYPDNGDSSYNQKFRERVTITRDTSTSTAYLELSSLRSEDTAVYYCVLAP RWYFSVWGQGTLVTVSS
	V_L	887	DIQMTQSPSSLSASVGDRVTITCRASQDISNYLNWYQQKPGKAPKLLIYYTS RLRSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQGHTLPPTFGQGTKV EIK
Varlilumab	V_H	888	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYDMHWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR GSGNWGFFDYWGQGTLVTVSS
	V_L	889	DIQMTQSPSSLSASVGDRVTITCRASQGISRWLAWYQQKPEKAPKSLIYAAS SLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYNTYPRTFGQGTKV EIK
Atezolizumab	V_H	890	EVQLVESGGGLVQPGGSLRLSCAASGFTFSDSWIHWVRQAPGKGLEWVA WISPYGGSTYYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCARR HWPGGFDYWGQGTLVTVSS
	V_L	891	DIQMTQSPSSLSASVGDRVTITCRASQDVSTAVAWYQQKPGKAPKLLIYSA SFLYSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYLYHPATFGQGTK VEIK
Durvalumab	V_H	892	EVQLVESGGGLVQPGGSLRLSCAASGFTFSRYWMSWVRQAPGKGLEWVA NIKQDGSEKYYVDSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYYCARE GGWFGELAFDYWGQGTLVTVSS
	V_L	893	EIVLTQSPGTLSLSPGERATLSCRASQRVSSSYLAWYQQKPGQAPRLLIYDA SSRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQQYGSLPWTFGQGTK VEIK
MDX-1106	V_H	894	QVQLVQSGAEVKKPGSSVKVSCKTSGDTFSTYAISWVRQAPGQGLEWMG GIIPIFGKAHYAQKFQGRVTITADESTSTAYMELSSLRSEDTAVYFCARKFH FVSGSPFGMDVWGQGTTVTVSS
	V_L	895	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDAS NRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSNWPTFGQGTKVE IK
Ipilumumab	V_H	896	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYTMHWVRQAPGKGLEWVT FISYDGNNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAIYYCARTG WLGPFDYWGQGTLVTVSS
	V_L	897	EIVLTQSPGTLSLSPGERATLSCRASQSVGSSYLAWYQQKPGQAPRLLIYGA FSRATGIPDRFSGSGSGTDFTLTISRLEPEDFAVYYCQQYGSSPWTFGQGTK VEIK
MDX-1105	V_H	901	QVQLVQSGAEVKKPGSSVKVSCKTSGDTFSTYAISWVRQAPGQGLEWMG GIIPIFGKAHYAQKFQGRVTITADESTSTAYMELSSLRSEDTAVYFCARKFH

Antibody	Region	SEQ ID NO:	Sequence
			FVSGSPFGMDVWGQGTTVTVSS
	V_L	902	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDAS NRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSNWPTFGQGTKVE IK

TABLE 3. Tumor Antibody Heavy Chain and Light Chain sequences

Antibody	Region	SEQ ID NO:	Sequence
Pertuzumab	Heavy Chain	11	EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVA DVNPNSGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARN LGPSFYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKD YFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYIC NVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTL MISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYR VVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPG
	Light Chain	16	DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSAS YRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFGQGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
Cetuximab	Heavy Chain	24	QVQLKQSGPGLVQPSQSLSITCTVSGFSLTNYGVHWVRQSPGKGLEWLGVI WSGGNTDYNTPFTSRLSINKDNSKSQVFFKMNSLQSNDTAIYYCARALTYY DYEFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFP EPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVN HKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISR TPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVS VLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR DELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFL YSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	29	DILLTQSPVILSVSPGERVSFSCRASQSIGTNIHWYQQRTNGSPRLLIKYASES ISGIPSRFSGSGSGTDFTLSINSVESEDIADYYCQQNNNWPTTFGAGTKLELK RTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGN SQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSF NRGEC
Panitumumab	Heavy Chain	37	QVQLQESGPGLVKPSETLSLTCTVSGGSVSSGDYYWTWIRQSPGKGLEWIG HIYYSGNTNYNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAIYYCVRDRVTG AFDIWGQGTMVTVSSASTKGPSVFPLAPCSRSTSESTAALGCLVKDYFPEPV TVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSNFGTQTYTCNVDHK PSNTKVDKTVERKCCVECPPCPAPPVAGPSVFLFPPKPKDTLMISRTPEVTC VVVDVSHEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTFRVVSVLTVVH QDWLNGKEYKCKVSNKGLPAPIEKTISKTKGQPREPQVYTLPPSREEMTKN QVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPMLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	42	DIQMTQSPSSLSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKLLIYDA SNLETGVPSRFSGSGSGTDFTFTISSLQPEDIATYFCQHFDHLPLAFGGGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC

Antibody	Region	SEQ ID NO:	Sequence
Nimotuzumab	Heavy Chain	50	QVQLQQSGAEVKKPGSSVKVSCKASGYTFTNYYIYWVRQAPGQGLEWIG GINPTSGGSNFNEKFKTRVTITVDESTNTAYMELSSLRSEDTAFYFCARQGL WFDSDGRGFDFWGQGSTVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTY ICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	55	DIQMTQSPSSLSASVGDRVTITCRSSQNIVHSNGNTYLDWYQQTPGKAPKL LIYKVSNRFSGVPSRFSGSGSGTDFTFTISSLQPEDIATYYCFQYSHVPWTFG QGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKV DNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQG LSSPVTKSFNRGEC
Zalutumumab	Heavy Chain	63	QVQLVESGGGVVQPGRSLRLSCAASGFTFSTYGMHWVRQAPGKGLEWVA VIWDDGSYKYYGDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DGITMVRGVMKDYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSS SLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLF PPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPRE EQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQP REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTT PPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSP GK
	Light Chain	68	AIQLTQSPSSLSASVGDRVTITCRASQDISSALVWYQQKPGKAPKLLIYDAS SLESGVPSRFSGSESGTDFTLTISSLQPEDFATYYCQQFNSYPLTFGGGTKVE IKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQS GNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
Onartuzumab	Heavy Chain	76	EVQLVESGGGLVQPGGSLRLSCAASGYTFTSYWLHWVRQAPGKGLEWVG MIDPSNSDTRFNPNFKDRFTISADTSKNTAYLQMNSLRAEDTAVYYCATYR SYVTPLDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDY FPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICN VNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRV VSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPP SREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSF FLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	81	DIQMTQSPSSLSASVGDRVTITCKSSQSLLYTSSQKNYLAWYQQKPGKAPK LLIYWASTRESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYAYPWT FGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQW KVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTH QGLSSPVTKSFNRGEC
Patritumab	Heavy Chain	89	QVQLQQWGAGLLKPSETLSLTCAVYGGSFSGYYWSWIRQPPGKGLEWIGE INHSGSTNYNPSLKSRVTISVETSKNQFSLKLSSVTAADTAVYYCARDKWT WYFDLWGRGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNH KPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRT PEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	94	DIEMTQSPDSLAVSLGERATINCRSSQSVLYSSSNRNYLAWYQQNPGQPPK LLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQQYYSTPRT FGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQW KVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTH QGLSSPVTKSFNRGEC
Clivatuzumab	Heavy	102	QVQLQQSGAEVKKPGASVKVSCEASGYTFPSYVLHWVKQAPGQGLEWIG

Antibody	Region	SEQ ID NO:	Sequence
	Chain		YINPYNDGTQYNEKFKGKATLTRDTSINTAYMELSRLRSDDTAVYYCARG FGGSYGFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKD YFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYIC NVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTL MISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYR VVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	107	DIQLTQSPSSLSASVGDRVTMTCSASSSVSSSYLYWYQQKPGKAPKLWIYS TSNLASGVPARFSGSGSGTDFTLTISSLQPEDSASYFCHQWNRYPYTFGGGT RLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNA LQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSP VTKSFNRGEC
Sofituzumab	Heavy Chain	115	EVQLVESGGGLVQPGGSLRLSCAASGYSITNDYAWNWVRQAPGKGLEWV GYISYSGYTTYNPSLKSRFTISRDTSKNTLYLQMNSLRAEDTAVYYCARWT SGLDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNH KPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRT PEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	120	DIQMTQSPSSLSASVGDRVTITCKASDLIHNWLAWYQQKPGKAPKLLIYGA TSLETGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYWTTPFTFGQGTK VEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNAL QSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPV TKSFNRGEC
Edrecolomab	Heavy Chain	128	QVQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWVKQRPGQGLEWIGV INPGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSAVYFCARDGP WFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEP VTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNH KPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRT PEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	133	NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLIYG ASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSYPYTFGGG TKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDN ALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSS PVTKSFNRGEC
Adecatumumab	Heavy Chain	141	EVQLLESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVA VISYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAKD MGWGSGWRPYYYYGMDVWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVP SSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVF LFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKP REEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKG QPREPQVYTLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLS LSPGK
	Light Chain	146	ELQMTQSPSS LSASVGDRVT ITCRTSQSIS SYLNWYQQKP GQPPKLLIYW ASTRESGVPD RFSGSGSGTD FTLTISSLQP EDSATYYCQQ SYDIPYTFGQ GTKLEIKRTV AAPSVFIFPP SDEQLKSGTA SVVCLLNNFY PREAKVQWKV DNALQSGNSQ ESVTEQDSKD STYSLSSTLT LSKADYEKHK VYACEVTHQG LSSPVTKSFN RGEC
Anetumab	Heavy	154	QVELVQSGAEVKKPGESLKISCKGSGYSFTSYWIGWVRQAPGKGLEWMGII

Antibody	Region	SEQ ID NO:	Sequence
	Chain		DPGDSRTRYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCARGQLY GGTYMDGWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDY FPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICN VNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRV VSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPP SRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSF FLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	159	DIALTQPASVSGSPGQSITISCTGTSSDIGGYNSVSWYQQHPGKAPKLMIYG VNNRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYCSSYDIESATPVFGG GTKLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPGAVTVAWKG DSSPVKAGVETTTPSKQSNNKYAASSYLSLTPEQWKSHRSYSCQVTHEGST VEKT VAPTECS
huDS6	Heavy Chain	167	QAQLVQSGAEVVKPGASVKMSCKASGYTFTSYNMHWVKQTPGQGLEWIG YIYPGNGATNYNQKFQGKATLTADPSSSTAYMQISSLTSEDSAVYFCARGD SVPFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFP EPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVN HKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISR TPEVTCWVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRD ELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	172	EIVLTQSPATMSASPGERVTITCSAHSSVSFMHWFQQKPGTSPKLWIYSTSS LASGVPARFGGSGSGTSYSLTISSMEAEDAATYYCQQRSSFPLTFGAGTKLE LKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQS GNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
Lifastuzumab	Heavy Chain	180	EVQLVESGGGLVQPGGSLRLSCAASGFSFSDFAMSWVRQAPGKGLEWVAT IGRVAFHTYYPDSMKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARHR GFDVGHFDFWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKD YFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYIC NVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTL MISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYR VVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	185	DIQMTQSPSSLSASVGDRVTITCRSSETLVHSSGNTYLEWYQQKPGKAPKL LIYRVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCFQGSFNPLTFG QGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKV DNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQG LSSPVTKSFNRGEC
Sacituzumab	Heavy Chain	193	QVQLQQSGSELKKPGASVKVSCKASGYTFTNYGMNWVKQAPGQGLKWM GWINTYTGEPTYTDDFKGRFAFSLDTSVSTAYLQISSLKADDTAVYFCARG GFGSSYWYFDVWGQGSLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTY ICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	198	DIQLTQSPSS LSASVGDRVS ITCKASQDVS IAVAWYQQKP GKAPKLLIYS ASYRYTGVPD RFSGSGSGTD FTLTISSLQP EDFAVYYCQQ HYITPLTFGA GTKVEIKRTV AAPSVFIFPP SDEQLKSGTA SVVCLLNNFY PREAKVQWKV DNALQSGNSQ ESVTEQDSKD STYSLSSTLT LSKADYEKHK VYACEVTHQG LSSPVTKSFN RGEC
PR1A3	Heavy Chain	206	QVKLQQSGPELKKPGETVKISCKASGYTFTEFGMNWVKQAPGKGLKWMG WINTKTGEATYVEEFKGRFAFSLETSATTAYLQINNLKNEDTAKYFCARW DFYDYVEAMDYWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCL

Antibody	Region	SEQ ID NO:	Sequence
			VKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQT YICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKD TLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNST YRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVY TLPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDS DGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	211	DIVMTQSQRFMSTSVGDRVSVTCKASQNVGTNVAWYQQKPGQSPKALIYS ASYRYSGVPDRFTGSGSGTDFTLTISNVQSEDLAEYFCHQYYTYPLFTFGSG TKLEMKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVD NALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLS SPVTKSFNRGEC
Humanized PR1A3	Heavy Chain	813	QVQLVQSGAEVKKPGASVKVSCKASGYTFTEFGMNWVRQAPGQGLEWM GWINTKTGEATYVEEFKGRVTFTTDTSTSTAYMELRSLRSDDTAVYYCAR WDFAYYVEAMDYWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGGTAALGC LVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPK DTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNS TYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQV YTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLD SDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	814	DIQMTQSPSSLSASVGDRVTITCKASAAVGTYVAWYQQKPGKAPKLLIYSA SYRKRGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCHQYYTYPLFTFGQGT KLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNA LQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSP VTKSFNRGEC
Humanized Ab2-3	Heavy Chain	831	EVQLQESGPGLVKPGGSLSLSCAASGFVFSSYDMSWVRQTPERGLEWVAYI SSGGGITYAPSTVKGRFTVSRDNAKNTLYLQMNSLTSEDTAVYYCAAHYF GSSGPFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDY FPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICN VNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRV VSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPP SREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSF FLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	832	DIQMTQSPASLSASVGDRVTITCRASENIFSYLAWYQQKPGKSPKLLVYNT RTLAEGVPSRFSGSGSGTDFSLTISSLQPEDFATYYCQHHYGTPFTFGSGTKL EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
IMAB362, CLAUDIXIMAB	Heavy Chain	219	QVQLQQPGAELVRPGASVKLSCKASGYTFTSYWINWVKQRPGQGLEWIGN IYPSDSYTNYNQKFKDKATLTVDKSSSTAYMQLSSPTSEDSAVYYCTRSWR GNSFDYWGQGTTLTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFP EPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVN HKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISR TPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVS VLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFL YSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	224	DIVMTQSPSSLTVTAGEKVTMSCKSSQSLLNSGNQKNYLTWYQQKPGQPP KLLIYWASTRESGVPDRFTGSGSGTDFTLTISSVQAEDLAVYYCQNDYSYPF TFGSGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQW KVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTH QGLSSPVTKSFNRGEC
AMG595	Heavy Chain	258	QVQLVESGGGVVQSGRSLRLSCAASGFTFRNYGMHWVRQAPGKGLEWVA VIWYDGSDKYYADSVRGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARD GYDILTGNPRDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGT QTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKP KDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQY

Antibody	Region	SEQ ID NO:	Sequence
			NSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREP QVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPV LDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	263	DTVMTQTPLSSHVTLGQPASISCRSSQSLVHSDGNTYLSWLQQRPGQPPRL LIYRISRRFSGVPDRFSGSGAGTDFTLEISRVEAEDVGVYYCMQSTHVPRTF GQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWK VDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQ GLSSPVTKSFNRGEC
ABT806	Heavy Chain	271	EVQLQESGPGLVKPSQTLSLTCTVSGYSISRDFAWNWIRQPPGKGLEWMG YISYNGNTRYQPSLKSRITISRDTSKNQFFLKLNSVTAADTATYYCVTASRG FPYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPV TVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKP SNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPE VTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLT VLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEM TKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSK LTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	276	DIQMTQSPSSMSVSVGDRVTITCHSSQDINSNIGWLQQKPGKSFKGLIYHGT NLDDGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCVQYAQFPWTFGGGTK LEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNAL QSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPV TKSFNRGEC
Sibrotuzumab	Heavy Chain	284	QVQLVQSGAEVKKPGASVKVSCKTSRYTFTEYTIHWVRQAPGQRLEWIGG INPNNGIPNYNQKFKGRVTITVDTSASTAYMELSSLRSEDTAVYYCARRRIA YGYDEGHAMDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCL VKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQT YICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKD TLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNST YRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVY TLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDS DGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	289	DIVMTQSPDSLAVSLGERATINCKSSQSLLYSRNQKNYLAWYQQKPGQPPK LLIFWASTRESGVPDRFSGSGFGTDFTLTISSLQAEDVAVYYCQQYFSYPLT FGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQW KVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTH QGLSSPVTKSFNRGEC
DS-8895a variant 1	Heavy Chain	297	QVQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLEWM GWINTYTGEPTYSDDFKGRVTITADTSTSTAYLELSSLRSEDTAVYYCATY YRYERDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKD YFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYIC NVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTL MISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYR VVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	302	DIVMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLIY KVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGQ GTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVD NALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLS SPVTKSFNRGEC
DS-8895a variant 2	Heavy Chain	310	QIQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLKWMG WINTYTGEPTYSDDFKGRFAFSLDTSTSTAYLELSSLRSEDTAVYYCATYY RYERDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDY FPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICN VNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMI SRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRV VSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPP SREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSF FLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK

Antibody	Region	SEQ ID NO:	Sequence
	Light Chain	315	DVLMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLI YKVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFG QGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKV DNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQG LSSPVTKSFNRGEC
MEDI-547	Heavy Chain	323	EVQLLESGGGLVQPGGSLRLSCAASGFTFSHYMMAWVRQAPGKGLEWVS RIGPSGGPTHYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAGY DSGYDYVAVAGPAEYFQHWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVP SSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVF LFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKP REEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKG QPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLS LSPGK
	Light Chain	328	DIQMTQSPSSLSASVGDRVTITCRASQSISTWLAWYQQKPGKAPKLLIYKAS NLHTGVPSRFSGSGSGTEFSLTISGLQPDDFATYYCQQYNSYSRTFGQGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
Narnatumab	Heavy Chain	336	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYLMTWVRQAPGKGLEWVA NIKQDGSEKYYVDSVKGRFTISRDNAKNSLNLQMNSLRAEDTAVYYCTRD GYSSGRHYGMDVWGQGTTVIVSSASTKGPSVFPLAPSSKSTSGGTAALGCL VKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQT YICNVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKD TLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNST YRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVY TLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDS DGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	341	EIVLTQSPATLSLSPGERATLSCRASQSVSRYLAWYQQKPGQAPRLLIYDAS NRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSNWPRTFGQGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
RG7841	Heavy Chain	349	EVQLVESGPALVKPTQTLTLTCTVSGFSLTGYSVNWIRQPPGKALEWLGMI WGDGSTDYNSALKSRLTISKDTSKNQVVLTMTNMDPVDTATYYCARDYY FNYASWFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYI CNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	354	DIQMTQSPSSLSASVGDRVTITCSASQGISNYLNWYQQKPGKTVKLLIYYTS NLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQYSELPWTFGQGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
Farletuzumab	Heavy Chain	362	EVQLVESGGGVVQPGRSLRLSCSASGFTFSGYGLSWVRQAPGKGLEWVA MISSGGSYTYYADSVKGRFAISRDNAKNTLFLQMDSLRPEDTGVYFCARH GDDPAWFAYWGQGTPVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYI CNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light	367	DIQLTQSPSSLSASVGDRVTITCSVSSSISSNNLHWYQQKPGKAPKPWIYGTS

Antibody	Region	SEQ ID NO:	Sequence
	Chain		NLASGVPSRFSGSGSGTDYTFTISSLQPEDIATYYCQQWSSYPYMYTFGQGT KVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNA LQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSP VTKSFNRGEC
Mirvetuximab	Heavy Chain	375	QVQLVQSGAEVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSLEWIGR IHPYDGDTFY NQKFQGKATLTVDKSSNTAHMELLSLTSEDFAVYYCTRYDGSRAMDYWG QGTTVTVSSAS TKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTF PAVLQSSGL YSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPA PELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKT KPREEQYNST YRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVY TLPPSRDELT KNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKL TVDKSRWQQ GNVFSCSVMHEALHNHYTQKSLSLSPG
	Light Chain	380	DIVLTQSPLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPGQQPRLLI YRASNLEAGVPDRFSGSGSKTDFTLTISPVEAEDAATYYCQQSREYPYTFG GGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKV DNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQG LSSPVTKSFNRGEC
J591 variant 1	Heavy Chain	388	EVQLQQSGPELKKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNIN PNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWNF DYWGQGTTLTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVT VSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS NTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEV TCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTV LHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMT KNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKL TVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	393	DIVMTQSHKFMSTSVGDRVSIICKASQDVGTAVDWYQQKPGQSPKLLIYW ASTRHTGVPDRFTGSGSGTDFTLTITNVQSEDLADYFCQQYNSYPLTFGAG TMLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVD NALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLS SPVTKSFNRGEC
J591 variant 2	Heavy Chain	401	EVQLQQSGPELVKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNIN PNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWNF DYWGQGTTLTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPVT VSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPS NTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEV TCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTV LHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMT KNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKL TVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	406	NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLIYG ASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSYPYTFGGG TKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDN ALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSS PVTKSFNRGEC
Rovalpituzumab	Heavy Chain	414	QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQGLEWM GWINTYTGEPTYADDFKGRVTMTTDTSTSTAYMELRSLRSDDTAVYYCAR IGDSSPSDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKD YFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYIC NVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTL

Antibody	Region	SEQ ID NO:	Sequence
			MISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYR VVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLP PSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPG
	Light Chain	419	EIVMTQSPATLSVSPGERATLSCKASQSVSNDVVWYQQKPGQAPRLLIYYA SNRYTGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQDYTSPWTFGQGTK LEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNAL QSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPV TKSFNRGEC
PF-06647020	Heavy Chain	427	QVQLVQSGPEVKKPGASVKVSCKASGYTFTDYAVHWVRQAPGKRLEWIG VISTYNDYTYNNQDFKGRVTMTRDTSASTAYMELSRLRSEDTAVYYCARG NSYFYALDYWGQGTSVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKD YFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYIC NVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTL MISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYR VVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	432	EIVLTQSPATLSLSPGERATLSCRASESVDSYGKSFMHWYQQKPGQAPRLLI YRASNLESGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQSNEDPWTFGG GTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVD NALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLS SPVTKSFNRGEC
Antibody to PTK7	Heavy Chain	440	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYAFHWVRQAPGKGLEWVA VISYDGSIKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARTY YFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEP VTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNH KPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRT PEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	445	EIVLTQSPDFQSVTPKEKVTITCRASQSIGSSLHWYQQKPDQSPKLLIKYASQ SFSGVPSRFSGSGSGTDFTLTINSLEAEDAAAYYCHQSSSLPITFGQGTRLEI KRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSG NSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
Ladiratuzumab	Heavy Chain	453	QVQLVQSGAEVKKPGASVKVSCKASGLTIEDYYMHWVRQAPGQGLEWM GWIDPENGDTEYGPKFQGRVTMTRDTSINTAYMELSRLRSDDTAVYYCAV HNAHYGTWFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCL VKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQT YICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKD TLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNST YRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVY TLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDS DGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	458	DVVMTQSPLSLPVTLGQPASISCRSSQSLLHSSGNTYLEYFQQRPGQSPRPLI YKISTRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGG GTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVD NALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLS SPVTKSFNRGEC
Cirmtuzumab	Heavy Chain	466	QVQLQESGPGLVKPSQTLSLTCTVSGYAFTAYNIHWVRQAPGQGLEWMGS FDPYDGGSSYNQKFKDRLTISKDTSKNQVVLTMTNMDPVDTATYYCARG WYYFDYWGHGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNV NHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMIS RTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVV SVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPS REEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFF

Antibody	Region	SEQ ID NO:	Sequence
			LYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	471	DIVMTQTPLSLPVTPGEPASISCRASKSISKYLAWYQQKPGQAPRLLIYSGST LQSGIPPRFSGSGYGTDFTLTINNIESEDAAYYFCQQHDESPYTFGEGTKVEI KRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSG NSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
Antibody to MAGE-A3	Heavy Chain	479	QVQLVESGGGVVQPGRSLRLSCTASGFRFRSHGMHWVRQAPGKGLEWVA VISYDGNNKLYADSVKGRITISRDNSKNTLFLQMNNVRAEDTAVYYCASP YTSDWQYFQYWGQGTLVIVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYI CNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	484	EIVMTQSPATLSVSPGERATFSCRASQNISTTLAWYQQKPGQAPRLLIYDTS TRATGIPARFSGSGSGTEFTLTISSLQSEDLAVYYCQQSNSWPLTFGGGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
Antibody to NY-ESO-1	Heavy Chain	492	QVQLVQSGGGVVRPGGSLRLSCAASGFSFIDYGMSWVRQVPGKGLEWVA GMNWSGDKKGHAESVKGRFIISRDNAKNTLYLEMSSLRVEDTALYFCARG EYSNRFDPRGRGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNV NHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMIS RTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVV SVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPS REEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFF LYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	497	DIVMTQTPLSLPVTLGQPASLSCRSSQSLVFTDGNTYLNWFQQRPGQSPRRL IYKVSSRDPGVPDRFSGTGSGTDFTLEISRVEAEDIGVYYCMQGTHWPPIFG QGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKV DNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQG LSSPVTKSFNRGEC
Trastuzumab	Heavy Chain	681	EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVAR IYPTNGYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWG GDGFYAMDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYI CNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	682	DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSA SFLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC

TABLE 4. Fusion Sequences – CD40 fusions via the heavy chain

Antibody	Region	SEQ ID NO:	Sequence
Pertuzumab	HC CD40 mAb with tumor mAb ScFv	21	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS

Antibody	Region	SEQ ID NO:	Sequence
			LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLVESGGGLVQPGG SLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVADVNPNSGGSIYNQRF KGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCARNLGPSFYFDYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTI TCKASQDVSIGVAWYQQKPGKAPKLLIYSASYRYTGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQYYIYPYTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	22	EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEW VADVNPNSGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYY CARNLGPSFYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAAL GCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSS SLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSV FLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAK TKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS KAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNG QPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKAS GYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMT RDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTI TCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
	HC tumor mAb with CD40 mAb scFv (LH)	845	EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEW VADVNPNSGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYY CARNLGPSFYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAAL GCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSS SLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSV FLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAK TKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS KAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNG QPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPGGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRAS QGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTIS SLQPEDFATYYCQQANIFPLTFGGGTKVEIKGGGGSGGGGSGGGGSGGG GSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQG LEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDT AVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSS
Cetuximab	HC CD40 mAb with tumor mAb ScFv	34	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLKQSGPGLVQPSQ SLSITCTVSGFSLTNYGVHWVRQSPGKGLEWLGVIWSGGNTDYNTPFTS RLSINKDNSKSQVFFKMNSLQSNDTAIYYCARALTYYDYEFAYWGQGT LVTVSAGGGGSGGGGSGGGGSGGGGSDILLTQSPVILSVSPGERVSFSCR ASQSIGTNIHWYQQRTNGSPRLLIKYASESISGIPSRFSGSGSGTDFTLSIN SVESEDIADYYCQQNNNWPTTFGAGTKLELK
	HC tumor mAb with CD40 mAb	35	QVQLKQSGPGLVQPSQSLSITCTVSGFSLTNYGVHWVRQSPGKGLEWL GVIWSGGNTDYNTPFTSRLSINKDNSKSQVFFKMNSLQSNDTAIYYCAR ALTYYDYEFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTSGGTAALG

Antibody	Region	SEQ ID NO:	Sequence
	ScFv		CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Panitumumab	HC CD40 mAb with tumor mAb ScFv	47	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLQESGPGLVKPSE TLSLTCTVSGGSVSSGDYYWTWIRQSPGKGLEWIGHIYYSGNTNYNPSL KSRLTISIDTSKTQFSLKLSSVTAADTAIYYCVRDRVTGAFDIWGQGTMV TVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCQA SQDISNYLNWYQQKPGKAPKLLIYDASNLETGVPSRFSGSGSGTDFTFTI SSLQPEDIATYFCQHFDHLPLAFGGGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	48	QVQLQESGPGLVKPSETLSLTCTVSGGSVSSGDYYWTWIRQSPGKGLE WIGHIYYSGNTNYNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAIYYCVR DRVTGAFDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPK PKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREE QYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQ PREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY KTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQK SLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFTG YYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSIS TAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTV SSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQ GIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISS LQPEDFATYYCQQANIFPLTFGGGTKVEIK
Nimotuzumab	HC CD40 mAb with tumor mAb ScFv	60	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLQQSGAEVKKPG SSVKVSCKASGYTFTNYYIYWVRQAPGQGLEWIGGINPTSGGSNFNEKF KTRVTITVDESTNTAYMELSSLRSEDTAFYFCARQGLWFDSDGRGFDF WGQGSTVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGD RVTITCRSSQNIVHSNGNTYLDWYQQTPGKAPKLLIYKVSNRFSGVPSRF SGSGSGTDFTFTISSLQPEDIATYYCFQYSHVPWTFGQGTKLEIK
	HC tumor mAb with	61	QVQLQQSGAEVKKPGSSVKVSCKASGYTFTNYYIYWVRQAPGQGLEWI GGINPTSGGSNFNEKFKTRVTITVDESTNTAYMELSSLRSEDTAFYFCAR

Antibody	Region	SEQ ID NO:	Sequence
	CD40 mAb ScFv		QGLWFDSDGRGFDFWGQGSTVTVSSASTKGPSVFPLAPSSKSTSGGTAA LGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPS SSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCK ASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVT MTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDR VTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Zalutumumab	HC CD40 mAb with tumor mAb ScFv	73	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVESGGGVVQPG RSLRLSCAASGFTFSTYGMHWVRQAPGKGLEWVAVIWDDGSYKYYGD SVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDGITMVRGVMK DYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSAIQLTQSPSSLS ASVGDRVTITCRASQDISSALVWYQQKPGKAPKLLIYDASSLESGVPSRF SGSESGTDFTLTISSLQPEDFATYYCQQFNSYPLTFGGGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	74	QVQLVESGGGVVQPGRSLRLSCAASGFTFSTYGMHWVRQAPGKGLEW VAVIWDDGSYKYYGDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVY YCARDGITMVRGVMKDYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDG VEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKAL PAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIA VEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCS VMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGAS VKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQK FQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCS YFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSA SVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRF SGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Onartuzumab	HC CD40 mAb with tumor mAb ScFv	86	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLVESGGGLVQPGG SLRLSCAASGYTFTSYWLHWVRQAPGKGLEWVGMIDPSNSDTRFNPNF KDRFTISADTSKNTAYLQMNSLRAEDTAVYYCATYRSYVTPLDYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTI TCKSSQSLLYTSSQKNYLAWYQQKPGKAPKLLIYWASTRESGVPSRFSG SGSGTDFTLTISSLQPEDFATYYCQQYYAYPWTFGQGTKVEIK
	HC tumor	87	EVQLVESGGGLVQPGGSLRLSCAASGYTFTSYWLHWVRQAPGKGLEW

Antibody	Region	SEQ ID NO:	Sequence
	mAb with CD40 mAb ScFv		VGMIDPSNSDTRFNPNFKDRFTISADTSKNTAYLQMNSLRAEDTAVYYC ATYRSYVTPLDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Patritumab	HC CD40 mAb with tumor mAb ScFv	99	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLQQWGAGLLKPS ETLSLTCAVYGGSFSGYYWSWIRQPPGKGLEWIGEINHSGSTNYNPSLK SRVTISVETSKNQFSLKLSSVTAADTAVYYCARDKWTWYFDLWGRGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIEMTQSPDSLAVSLGERATINCR SSQSVLYSSSNRNYLAWYQQNPGQPPKLLIYWASTRESGVPDRFSGSGS GTDFTLTISSLQAEDVAVYYCQQYYSTPRTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	100	QVQLQQWGAGLLKPSETLSLTCAVYGGSFSGYYWSWIRQPPGKGLEWI GEINHSGSTNYNPSLKSRVTISVETSKNQFSLKLSSVTAADTAVYYCARD KWTWYFDLWGRGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPK PKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREE QYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQ PREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY KTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQK SLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFTG YYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSIS TAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTV SSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQ GIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISS LQPEDFATYYCQQANIFPLTFGGGTKVEIK
Clivatuzumab	HC CD40 mAb with tumor mAb ScFv	112	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLQQSGAEVKKPG ASVKVSCEASGYTFPSYVLHWVKQAPGQGLEWIGYINPYNDGTQYNEK FKGKATLTRDTSINTAYMELSRLRSDDTAVYYCARGFGGSYGFAYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQLTQSPSSLSASVGDRVT MTCSASSSVSSSYLYWYQQKPGKAPKLWIYSTSNLASGVPARFSGSGSG TDFTLTISSLQPEDSASYFCHQWNRYPYTFGGGTRLEIK

Antibody	Region	SEQ ID NO:	Sequence
	HC tumor mAb with CD40 mAb ScFv	113	QVQLQQSGAEVKKPGASVKVSCEASGYTFPSYVLHWVKQAPGQGLEW IGYINPYNDGTQYNEKFKGKATLTRDTSINTAYMELSRLRSDDTAVYYC ARGFGGSYGFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Sofituzumab	HC CD40 mAb with tumor mAb ScFv	125	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLVESGGGLVQPGG SLRLSCAASGYSITNDYAWNWVRQAPGKGLEWVGYISYSGYTTYNPSL KSRFTISRDTSKNTLYLQMNSLRAEDTAVYYCARWTSGLDYWGQGTLV TVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKA SDLIHNWLAWYQQKPGKAPKLLIYGATSLETGVPSRFSGSGSGTDFTLTI SSLQPEDFATYYCQQYWTTPFTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	126	EVQLVESGGGLVQPGGSLRLSCAASGYSITNDYAWNWVRQAPGKGLE WVGYISYSGYTTYNPSLKSRFTISRDTSKNTLYLQMNSLRAEDTAVYYC ARWTSGLDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCL VKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGT QTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPP KPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPRE EQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKG QPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENN YKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQ KSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFT GYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSI STAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVT VSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRAS QGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTIS SLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Edrecolomab	HC CD40 mAb with tumor mAb ScFv	138	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLQQSGAELVRPGT SVKVSCKASGYAFTNYLIEWVKQRPGQGLEWIGVINPGSGGTNYNEKF KGKATLTADKSSSTAYMQLSSLTSDDSAVYFCARDGPWFAYWGQGTL VTVSAGGGGSGGGGSGGGGSGGGGSNIVMTQSPKSMSMSVGERVTLT CKASENVVTYVSWYQQKPEQSPKLLIYGASNRYTGVPDRFTGSGSATD

Antibody	Region	SEQ ID NO:	Sequence
			FTLTISSVQAEDLADYHCGQGYSYPYTFGGGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	139	QVQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWVKQRPGQGLEWI GVINPGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSAVYFCA RDGPWFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQ TYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPK PKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREE QYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQ PREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNY KTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQK SLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFTG YYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSIS TAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTV SSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQ GIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISS LQPEDFATYYCQQANIFPLTFGGGTKVEIK
Adecatumumab	HC CD40 mAb with tumor mAb ScFv	151	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLLESGGGVVQPGR SLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAVISYDGSNKYYADS VKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAKDMGWGSGWRPYY YYGMDVWGQGTTVTVSSGGGGSGGGGSGGGGSGGGGSELQMTQSPSS LSASVGDRVTITCRTSQSISSYLNWYQQKPGQPPKLLIYWASTRESGVPD RFSGSGSGTDFTLTISSLQPEDSATYYCQQSYDIPYTFGQGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	152	EVQLLESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEW VAVISYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYY CAKDMGWGSGWRPYYYYGMDVWGQGTTVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPG ASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYA QKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGV CSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSV SASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPS RFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Anetumab	HC CD40 mAb with tumor mAb ScFv	164	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVELVQSGAEVKKPGE SLKISCKGSGYSFTSYWIGWVRQAPGKGLEWMGIIDPGDSRTRYSPSFQ GQVTISADKSISTAYLQWSSLKASDTAMYYCARGQLYGGTYMDGWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIALTQPASVSGSPGQSITISC

Antibody	Region	SEQ ID NO:	Sequence
			TGTSSDIGGYNSVSWYQQHPGKAPKLMIYGVNNRPSGVSNRFSGSKSG NTASLTISGLQAEDEADYYCSSYDIESATPVFGGGTKLTVL
	HC tumor mAb with CD40 mAb ScFv	165	QVELVQSGAEVKKPGESLKISCKGSGYSFTSYWIGWVRQAPGKGLEWM GIIDPGDSRTRYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCAR GQLYGGTYMDGWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
huDS6	HC CD40 mAb with tumor mAb ScFv	177	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQAQLVQSGAEVVKPG ASVKMSCKASGYTFTSYNMHWVKQTPGQGLEWIGYIYPGNGATNYNQ KFQGKATLTADPSSSTAYMQISSLTSEDSAVYFCARGDSVPFAYWGQGT LVTVSAGGGGSGGGGSGGGGSGGGGSEIVLTQSPATMSASPGERVTITC SAHSSVSFMHWFQQKPGTSPKLWIYSTSSLASGVPARFGGSGSGTSYSL TISSMEAEDAATYYCQQRSSFPLTFGAGTKLELK
	HC tumor mAb with CD40 mAb ScFv	178	QAQLVQSGAEVVKPGASVKMSCKASGYTFTSYNMHWVKQTPGQGLE WIGYIYPGNGATNYNQKFQGKATLTADPSSSTAYMQISSLTSEDSAVYF CARGDSVPFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTSGGTAALGC LVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLG TQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFP PKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPR EEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAK GQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN NYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYT QKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTF TGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTS ISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLV TVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRA SQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTI SSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Lifastuzumab	HC CD40 mAb with tumor mAb ScFv	190	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLVESGGGLVQPGG SLRLSCAASGFSFSDFAMSWVRQAPGKGLEWVATIGRVAFHTYYPDSM KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARHRGFDVGHFDFWG

Antibody	Region	SEQ ID NO:	Sequence
			QGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRV TITCRSSETLVHSSGNTYLEWYQQKPGKAPKLLIYRVSNRFSGVPSRFSG SGSGTDFTLTISSLQPEDFATYYCFQGSFNPLTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	191	EVQLVESGGGLVQPGGSLRLSCAASGFSFSDFAMSWVRQAPGKGLEWV ATIGRVAFHTYYPDSMKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARHRGFDVGHFDFWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAAL GCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSS SLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSV FLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAK TKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS KAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNG QPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKAS GYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMT RDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTI TCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Sacituzumab	HC CD40 mAb with tumor mAb ScFv	203	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLQQSGSELKKPGA SVKVSCKASGYTFTNYGMNWVKQAPGQGLKWMGWINTYTGEPTYTD DFKGRFAFSLDTSVSTAYLQISSLKADDTAVYFCARGGFGSSYWYFDV WGQGSLVTVSSGGGGSGGGGSGGGGSGGGGSDIQLTQSPSSLSASVGD RVSITCKASQDVSIAVAWYQQKPGKAPKLLIYSASYRYTGVPDRFSGSG SGTDFTLTISSLQPEDFAVYYCQQHYITPLTFGAGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	204	QVQLQQSGSELKKPGASVKVSCKASGYTFTNYGMNWVKQAPGQGLK WMGWINTYTGEPTYTDDFKGRFAFSLDTSVSTAYLQISSLKADDTAVYF CARGGFGSSYWYFDVWGQGSLVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVP SSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCK ASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVT MTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDR VTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
PR1A3	HC CD40 mAb with tumor mAb ScFv	216	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVKLQQSGPELKKPGE TVKISCKASGYTFTEFGMNWVKQAPGKGLKWMGWINTKTGEATYVEE

Antibody	Region	SEQ ID NO:	Sequence
			FKGRFAFSLETSATTAYLQINNLKNEDTAKYFCARWDFYDYVEAMDY WGQGTTVTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQSQRFMSTSVG DRVSVTCKASQNVGTNVAWYQQKPGQSPKALIYSASYRYSGVPDRFTG SGSGTDFTLTISNVQSEDLAEYFCHQYYTYPLFTFGSGTKLEMK
	HC tumor mAb with CD40 mAb ScFv	217	QVKLQQSGPELKKPGETVKISCKASGYTFTEFGMNWVKQAPGKGLKW MGWINTKTGEATYVEEFKGRFAFSLETSATTAYLQINNLKNEDTAKYFC ARWDFYDYVEAMDYWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVP SSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCK ASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVT MTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDR VTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Humanized PR1A3	HC CD40 mAb with tumor mAb ScFv	815	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPG ASVKVSCKASGYTFTEFGMNWVRQAPGQGLEWMGWINTKTGEATYV EEFKGRVTFTTDTSTSTAYMELRSLRSDDTAVYYCARWDFAYYVEAM DYWGQGTTVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASV GDRVTITCKASAAVGTYVAWYQQKPGKAPKLLIYSASYRKRGVPSRFS GSGSGTDFTLTISSLQPEDFATYYCHQYYTYPLFTFGQGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	816	QVQLVQSGAEVKKPGASVKVSCKASGYTFTEFGMNWVRQAPGQGLE WMGWINTKTGEATYVEEFKGRVTFTTDTSTSTAYMELRSLRSDDTAVY YCARWDFAYYVEAMDYWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVT VPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLG GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVH NAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWE SNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHE ALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSC KASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRV TMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDY WGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGD RVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
	HC tumor mAb with CD40 mAb scFv (LH)	843	QVQLVQSGAEVKKPGASVKVSCKASGYTFTEFGMNWVRQAPGQGLE WMGWINTKTGEATYVEEFKGRVTFTTDTSTSTAYMELRSLRSDDTAVY YCARWDFAYYVEAMDYWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVT VPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLG GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVH NAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWE SNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHE ALHNHYTQKSLSLSPGGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITC

Antibody	Region	SEQ ID NO:	Sequence
			RASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFT LTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIKGGGGSGGGGSGGGGS GGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAP GQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRS DDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSS
Humanized Ab2-3	HC CD40 mAb with tumor mAb ScFv	833	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLQESGPGLVKPGG SLSLSCAASGFVFSSYDMSWVRQTPERGLEWVAYISSGGGITYAPSTVK GRFTVSRDNAKNTLYLQMNSLTSEDTAVYYCAAHYFGSSGPFAYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPASLSASVGDRVTI TCRASENIFSYLAWYQQKPGKSPKLLVYNTRTLAEGVPSRFSGSGSGTD FSLTISSLQPEDFATYYCQHHYGTPFTFGSGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	834	EVQLQESGPGLVKPGGSLSLSCAASGFVFSSYDMSWVRQTPERGLEWV AYISSGGGITYAPSTVKGRFTVSRDNAKNTLYLQMNSLTSEDTAVYYCA AHYFGSSGPFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
	HC tumor mAb with CD40 mAb scFv (LH)	841	EVQLQESGPGLVKPGGSLSLSCAASGFVFSSYDMSWVRQTPERGLEWV AYISSGGGITYAPSTVKGRFTVSRDNAKNTLYLQMNSLTSEDTAVYYCA AHYFGSSGPFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIY SWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQP EDFATYYCQQANIFPLTFGGGTKVEIKGGGGSGGGGSGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEW MGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVY YCARDQPLGYCTNGVCSYFDYWGQGTLVTVSS
IMAB362, CLAUDIXIMAB	HC CD40 mAb with tumor mAb ScFv	229	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS

Antibody	Region	SEQ ID NO:	Sequence
			CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLQQPGAELVRPG ASVKLSCKASGYTFTSYWINWVKQRPGQGLEWIGNIYPSDSYTNYNQK FKDKATLTVDKSSSTAYMQLSSPTSEDSAVYYCTRSWRGNSFDYWGQG TTLTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQSPSSLTVTAGEKVTM SCKSSQSLLNSGNQKNYLTWYQQKPGQPPKLLIYWASTRESGVPDRFTG SGSGTDFTLTISSVQAEDLAVYYCQNDYSYPFTFGSGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	230	QVQLQQPGAELVRPGASVKLSCKASGYTFTSYWINWVKQRPGQGLEWI GNIYPSDSYTNYNQKFKDKATLTVDKSSSTAYM QLSSPTSEDSAVYYCTRSWRGNSFDYWGQGTTLTVSSASTKGPSVFPLA PSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSG LYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVS NKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYP SDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNV FSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKP GASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNY AQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNG VCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSS VSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVP SRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
AMG595	HC CD40 mAb with tumor mAb ScFv	268	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVESGGGVVQSG RSLRLSCAASGFTFRNYGMHWVRQAPGKGLEWVAVIWYDGSDKYYA DSVRGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDGYDILTGNPR DFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDTVMTQTPLSSH VTLGQPASISCRSSQSLVHSDGNTYLSWLQQRPGQPPRLLIYRISRRFSGV PDRFSGSGAGTDFTLEISRVEAEDVGVYYCMQSTHVPRTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	269	QVQLVESGGGVVQSGRSLRLSCAASGFTFRNYGMHWVRQAPGKGLEW VAVIWYDGSDKYYADSVRGRFTISRDNSKNTLYLQMNSLRAEDTAVYY CARDGYDILTGNPRDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVV TVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLG GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVH NAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWE SNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHE ALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSC KASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRV TMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDY WGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGD RVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
ABT806	HC CD40 mAb with tumor mAb ScFv	281	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD

Antibody	Region	SEQ ID NO:	Sequence
			IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLQESGPGLVKPSQ TLSLTCTVSGYSISRDFAWNWIRQPPGKGLEWMGYISYNGNTRYQPSLK SRITISRDTSKNQFFLKLNSVTAADTATYYCVTASRGFPYWGQGTLVTV SSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSMSVSVGDRVTITCHSSQ DINSNIGWLQQKPGKSFKGLIYHGTNLDDGVPSRFSGSGSGTDYTLTISS LQPEDFATYYCVQYAQFPWTFGGGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	282	EVQLQESGPGLVKPSQTLSLTCTVSGYSISRDFAWNWIRQPPGKGLEWM GYISYNGNTRYQPSLKSRITISRDTSKNQFFLKLNSVTAADTATYYCVTA SRGFPYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDY FPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYI CNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPK DTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQY NSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPR EPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKT TPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSL SLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGYY MHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTA YMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSS GGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGI YSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQ PEDFATYYCQQANIFPLTFGGGTKVEIK
Sibrotuzumab	HC CD40 mAb with tumor mAb ScFv	294	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPG ASVKVSCKTSRYTFTEYTIHWVRQAPGQRLEWIGGINPNNGIPNYNQKF KGRVTITVDTSASTAYMELSSLRSEDTAVYYCARRRIAYGYDEGHAMD YWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSGGGGSDIVMTQSPDSLAVSL GERATINCKSSQSLLYSRNQKNYLAWYQQKPGQPPKLLIFWASTRESGV PDRFSGSGFGTDFTLTISSLQAEDVAVYYCQQYFSYPLTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	295	QVQLVQSGAEVKKPGASVKVSCKTSRYTFTEYTIHWVRQAPGQRLEWI GGINPNNGIPNYNQKFKGRVTITVDTSASTAYMELSSLRSEDTAVYYCA RRRIAYGYDEGHAMDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVT VPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLG GPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVH NAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIE KTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWE SNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHE ALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSC KASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRV TMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDY WGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGD RVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
DS-8895a variant 1	HC CD40 mAb with tumor mAb ScFv	307	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK

Antibody	Region	SEQ ID NO:	Sequence
			ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPG ASVKVSCKASGYTFIDYSMHWVRQAPGQGLEWMGWINTYTGEPTYSD DFKGRVTITADTSTSTAYLELSSLRSEDTAVYYCATYYRYERDFDYWG QGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQSPLSLPVTPGEPAS ISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLIYKVSNRFSGVPDRFSGSG SGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	308	QVQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLEW MGWINTYTGEPTYSDDFKGRVTITADTSTSTAYLELSSLRSEDTAVYYC ATYYRYERDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
DS-8895a variant 2	HC CD40 mAb with tumor mAb ScFv	320	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQIQLVQSGAEVKKPGA SVKVSCKASGYTFIDYSMHWVRQAPGQGLKWMGWINTYTGEPTYSDD FKGRFAFSLDTSTSTAYLELSSLRSEDTAVYYCATYYRYERDFDYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDVLMTQSPLSLPVTPGEPASIS CRSSQSIVHSSGITYLEWYLQKPGQSPQLLIYKVSNRFSGVPDRFSGSGS GTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	321	QIQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLKW MGWINTYTGEPTYSDDFKGRFAFSLDTSTSTAYLELSSLRSEDTAVYYC ATYYRYERDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
MEDI-547	HC CD40 mAb with tumor mAb ScFv	333	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV

Antibody	Region	SEQ ID NO:	Sequence
			DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLLESGGGLVQPGG SLRLSCAASGFTFSHYMMAWVRQAPGKGLEWVSRIGPSGGPTHYADSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAGYDSGYDYVAVAGP AEYFQHWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSL SASVGDRVTITCRASQSISTWLAWYQQKPGKAPKLLIYKASNLHTGVPS RFSGSGSGTEFSLTISGLQPDDFATYYCQQYNSYSRTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	334	EVQLLESGGGLVQPGGSLRLSCAASGFTFSHYMMAWVRQAPGKGLEW VSRIGPSGGPTHYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC AGYDSGYDYVAVAGPAEYFQHWGQGTLVTVSSASTKGPSVFPLAPSSK STSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSL SSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDG VEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKAL PAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIA VEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCS VMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGAS VKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQK FQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCS YFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSA SVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRF SGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Narnatumab	HC CD40 mAb with tumor mAb ScFv	346	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLVESGGGLVQPGG SLRLSCAASGFTFSSYLMTWVRQAPGKGLEWVANIKQDGSEKYYVDSV KGRFTISRDNAKNSLNLQMNSLRAEDTAVYYCTRDGYSSGRHYGMDV WGQGTTVIVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPATLSLSPGER ATLSCRASQSVSRYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGS GTDFTLTISSLEPEDFAVYYCQQRSNWPRTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	347	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYLMTWVRQAPGKGLEWV ANIKQDGSEKYYVDSVKGRFTISRDNAKNSLNLQMNSLRAEDTAVYYC TRDGYSSGRHYGMDVWGQGTTVIVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVP SSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCK ASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVT MTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDR VTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
RG7841	HC CD40 mAb with tumor mAb ScFv	359	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP

Antibody	Region	SEQ ID NO:	Sequence
			APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLVESGPALVKPTQ TLTLTCTVSGFSLTGYSVNWIRQPPGKALEWLGMIWGDGSTDYNSALK SRLTISKDTSKNQVVLTMTNMDPVDTATYYCARDYYFNYASWFAYWG QGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDRV TITCSASQGISNYLNWYQQKPGKTVKLLIYYTSNLHSGVPSRFSGSGSGT DYTLTISSLQPEDFATYYCQQYSELPWTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	360	EVQLVESGPALVKPTQTLTLTCTVSGFSLTGYSVNWIRQPPGKALEWLG MIWGDGSTDYNSALKSRLTISKDTSKNQVVLTMTNMDPVDTATYYCA RDYYFNYASWFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAA LGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPS SSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCK ASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVT MTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDR VTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Farletuzumab	HC CD40 mAb with tumor mAb ScFv	372	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLVESGGGVVQPG RSLRLSCSASGFTFSGYGLSWVRQAPGKGLEWVAMISSGGSYTYYADS VKGRFAISRDNAKNTLFLQMDSLRPEDTGVYFCARHGDDPAWFAYWG QGTPVTVSSGGGGSGGGGSGGGGSGGGGSDIQLTQSPSSLSASVGDRVT ITCSVSSSISSNNLHWYQQKPGKAPKPWIYGTSNLASGVPSRFSGSGSGT DYTFTISSLQPEDIATYYCQQWSSYPYMYTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	373	EVQLVESGGGVVQPGRSLRLSCSASGFTFSGYGLSWVRQAPGKGLEWV AMISSGGSYTYYADSVKGRFAISRDNAKNTLFLQMDSLRPEDTGVYFCA RHGDDPAWFAYWGQGTPVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Mirvetuximab	HC CD40 mAb with tumor mAb ScFv	385	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS

Antibody	Region	SEQ ID NO:	Sequence
			LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVVKPG ASVKISCKASGYTFTGYFMNWVKQSPGQSLEWIGRIHPYDGDTFYNQK FQGKATLTVDKSSNTAHMELLSLTSEDFAVYYCTRYDGSRAMDYWGQ GTTVTVSSGGGGSGGGGSGGGGSGGGGSDIVLTQSPLSLAVSLGQPAIIS CKASQSVSFAGTSLMHWYHQKPGQQPRLLIYRASNLEAGVPDRFSGSG SKTDFTLTISPVEAEDAATYYCQQSREYPYTFGGGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	386	QVQLVQSGAEVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSLEWI GRIHPYDGDTFYNQKFQGKATLTVDKSSNTAHMELLSLTSEDFAVYYC TRYDGSRAMDYWGQGTTVTVSSASTKGPSVFPLAPSSKSTSGGTAALG CLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSL GTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFL FPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTK PREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKA KGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPE NNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHY TQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYT FTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDT SISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTL VTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCR ASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTL TISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
J591 variant1	HC CD40 mAb with tumor mAb ScFv	398	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLQQSGPELKKPGT SVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNINPNNGGTTYNQKFE DKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWNFDYWGQGTTLT VSSGGGGSGGGGSGGGGSGGGGSDIVMTQSHKFMSTSVGDRVSIICKAS QDVGTAVDWYQQKPGQSPKLLIYWASTRHTGVPDRFTGSGSGTDFTLT ITNVQSEDLADYFCQQYNSYPLTFGAGTMLDLK
	HC tumor mAb with CD40 mAb ScFv	399	EVQLQQSGPELKKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIG NINPNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCA AGWNFDYWGQGTTLTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQT YICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKP KDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQ YNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQP REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKS LSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGY YMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSIST AYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVS SGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQG IYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSL QPEDFATYYCQQANIFPLTFGGGTKVEIK
J591 variant 2	HC CD40 mAb with tumor mAb	411	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS

Antibody	Region	SEQ ID NO:	Sequence
	ScFv		KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLQQSGPELVKPGT SVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNINPNNGGTTYNQKFE DKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWNFDYWGQGTTLT VSSGGGGSGGGGSGGGGSGGGGSNIVMTQSPKSMSMSVGERVTLTCKA SENVVTYVSWYQQKPEQSPKLLIYGASNRYTGVPDRFTGSGSATDFTLT ISSVQAEDLADYHCGQGYSYPYTFGGGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	412	EVQLQQSGPELVKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIG NINPNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCA AGWNFDYWGQGTTLTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQT YICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKP KDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQ YNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQP REPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYK TTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKS LSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGY YMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSIST AYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVS SGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQG IYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSL QPEDFATYYCQQANIFPLTFGGGTKVEIK
Rovalpituzumab	HC CD40 mAb with tumor mAb ScFv	424	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPG ASVKVSCKASGYTFTNYGMNWVRQAPGQGLEWMGWINTYTGEPTYA DDFKGRVTMTTDTSTSTAYMELRSLRSDDTAVYYCARIGDSSPSDYWG QGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVMTQSPATLSVSPGERAT LSCKASQSVSNDVVWYQQKPGQAPRLLIYYASNRYTGIPARFSGSGSGT EFTLTISSLQSEDFAVYYCQQDYTSPWTFGQGTKLEIK
	HC tumor mAb with CD40 mAb ScFv	425	QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQGLE WMGWINTYTGEPTYADDFKGRVTMTTDTSTSTAYMELRSLRSDDTAV YYCARIGDSSPSDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAAL GCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSS SLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSV FLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAK TKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS KAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNG QPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKAS GYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMT RDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTI TCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
PF-06647020	HC CD40 mAb with	437	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV

Antibody	Region	SEQ ID NO:	Sequence
	tumor mAb ScFv		YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGPEVKKPG ASVKVSCKASGYTFTDYAVHWVRQAPGKRLEWIGVISTYNDYTYNNQ DFKGRVTMTRDTSASTAYMELSRLRSEDTAVYYCARGNSYFYALDYW GQGTSVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPATLSLSPGERA TLSCRASESVDSYGKSFMHWYQQKPGQAPRLLIYRASNLESGIPARFSG SGSGTDFTLTISSLEPEDFAVYYCQQSNEDPWTFGGGTKLEIK	
	HC tumor mAb with CD40 mAb ScFv	438	QVQLVQSGPEVKKPGASVKVSCKASGYTFTDYAVHWVRQAPGKRLEW IGVISTYNDYTYNNQDFKGRVTMTRDTSASTAYMELSRLRSEDTAVYY CARGNSYFYALDYWGQGTSVTVSSASTKGPSVFPLAPSSKSTSGGTAAL GCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSS SLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSV FLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAK TKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTIS KAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNG QPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALH NHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKAS GYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMT RDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQ GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTI TCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTD FTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK	
Antibody to PTK7	HC CD40 mAb with tumor mAb ScFv	450	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVESGGGVVQPG RSLRLSCAASGFTFSSYAFHWVRQAPGKGLEWVAVISYDGSIKYYADSV KGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARTYYFDYWGQGTLV TVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPDFQSVTPKEKVTITCRA SQSIGSSLHWYQQKPDQSPKLLIKYASQSFSGVPSRFSGSGSGTDFTLTIN SLEAEDAAAYYCHQSSSLPITFGQGTRLEIK	
	HC tumor mAb with CD40 mAb ScFv	451	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYAFHWVRQAPGKGLEWV AVISYDGSIKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RTYYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKD YFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTY ICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPK DTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQY NSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPR EPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKT TPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSL SLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFTGYY MHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTA YMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSS GGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGI YSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQ PEDFATYYCQQANIFPLTFGGGTKVEIK
SGN-LIV1A	HC CD40	463	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE

Antibody	Region	SEQ ID NO:	Sequence
	mAb with tumor mAb ScFv		WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPG ASVKVSCKASGLTIEDYYMHWVRQAPGQGLEWMGWIDPENGDTEYGP KFQGRVTMTRDTSINTAYMELSRLRSDDTAVYYCAVHNAHYGTWFAY WGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDVVMTQSPLSLPVTLG QPASISCRSSQSLLHSSGNTYLEYFQQRPGQSPRPLIYKISTRFSGVPDRFS GSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIK	
	HC tumor mAb with CD40 mAb ScFv	464	QVQLVQSGAEVKKPGASVKVSCKASGLTIEDYYMHWVRQAPGQGLEW MGWIDPENGDTEYGPKFQGRVTMTRDTSINTAYMELSRLRSDDTAVYY CAVHNAHYGTWFAYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVP SSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCK ASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVT MTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDR VTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK	
Cirmtuzumab	HC CD40 mAb with tumor mAb ScFv	476	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLQESGPGLVKPSQ TLSLTCTVSGYAFTAYNIHWVRQAPGQGLEWMGSFDPYDGGSSYNQKF KDRLTISKDTSKNQVVLTMTNMDPVDTATYYCARGWYYFDYWGHGT LVTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQTPLSLPVTPGEPASISC RASKSISKYLAWYQQKPGQAPRLLIYSGSTLQSGIPPRFSGSGYGTDFTL TINNIESEDAAYYFCQQHDESPY TFGEGTKVEIK	
	HC tumor mAb with CD40 mAb ScFv	477	QVQLQESGPGLVKPSQTLSLTCTVSGYAFTAYNIHWVRQAPGQGLEWM GSFDPYDGGSSYNQKFKDRLTISKDTSKNQVVLTMTNMDPVDTATYYC ARGWYYFDYWGHGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCL VKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGT QTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPP KPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPRE EQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKG QPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENN YKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQ KSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTFT GYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSI STAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVT VSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRAS QGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTIS SLQPEDFATYYCQQANIFPLTFGGGTKVEIK	

Antibody	Region	SEQ ID NO:	Sequence
Antibody to MAGE-A3	HC CD40 mAb with tumor mAb ScFv	489	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVESGGGVVQPG RSLRLSCTASGFRFRSHGMHWVRQAPGKGLEWVAVISYDGNNKLYAD SVKGRITISRDNSKNTLFLQMNNVRAEDTAVYYCASPYTSDWQYFQYW GQGTLVIVSSGGGGSGGGGSGGGGSGGGGSEIVMTQSPATLSVSPGERA TFSCRASQNISTTLAWYQQKPGQAPRLLIYDTSTRATGIPARFSGSGSGT EFTLTISSLQSEDLAVYYCQQSNSWPLTFGGGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	490	QVQLVESGGGVVQPGRSLRLSCTASGFRFRSHGMHWVRQAPGKGLEW VAVISYDGNNKLYADSVKGRITISRDNSKNTLFLQMNNVRAEDTAVYY CASPYTSDWQYFQYWGQGTLVIVSSASTKGPSVFPLAPSSKSTSGGTAA LGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPS SSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCK ASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVT MTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDR VTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Antibody to NY-ESO-1	HC CD40 mAb with tumor mAb ScFv	502	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGGGVVRPG GSLRLSCAASGFSFIDYGMSWVRQVPGKGLEWVAGMNWSGDKKGHA ESVKGRFIISRDNAKNTLYLEMSSLRVEDTALYFCARGEYSNRFDPRGR GTLVTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQTPLSLPVTLGQPASL SCRSSQSLVFTDGNTYLNWFQQRPGQSPRRLIYKVSSRDPGVPDRFSGT GSGTDFTLEISRVEAEDIGVYYCMQGTHWPPIFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	503	QVQLVQSGGGVVRPGGSLRLSCAASGFSFIDYGMSWVRQVPGKGLEW VAGMNWSGDKKGHAESVKGRFIISRDNAKNTLYLEMSSLRVEDTALYF CARGEYSNRFDPRGRGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGC LVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLG TQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFP PKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPR EEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAK GQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPEN NYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYT QKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGYTF TGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTS ISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLV TVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRA SQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTI

Antibody	Region	SEQ ID NO:	Sequence
			SSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Trastuzumab	HC CD40 mAb with tumor mAb ScFv	683	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSEVQLVESGGGLVQPGG SLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTRYADSV KGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAMDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSLSASVGDR VTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPSRFSGSRS GTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIK
	HC tumor mAb with CD40 mAb ScFv	684	EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWV ARIYPTNGYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYC SRWGGDGFYAMDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAA LGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPS SSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPS VFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNA KTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKT ISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESN GQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEAL HNHYTQKSLSLSPGGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCK ASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVT MTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYW GQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSVSASVGDR VTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGS GTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
	HC CD40 mAb with tumor mAb ScFv (LH,25mer)	796	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSNK ALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSD IAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSDIQMTQSPSSLSASVG DRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYSGVPSRFSGS RSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKVEIKGGGGSGGG GSGGGGSGGGGSGGGGSEVQLVESGGGLVQPGGSLRLSCAASGFNIKD TYIHWVRQAPGKGLEWVARIYPTNGYTRYADSVKGRFTISADTSKNTA YLQMNSLRAEDTAVYYCSRWGGDGFYAMDYWGQGTLVTVSS

TABLE 5. APC Antibody CDRs

Antibody	Region	SEQ ID NO:	Sequence
CP-8709893	HCDR1	3	GYTFTGYY
	HCDR2	4	INPDSGGT
	HCDR3	5	ARDQPLGYCTNGVCSYFDY
	LCDR1	8	QGIYSW
	LCDR2	9	TAS
	LCDR3	10	QQANIFPLT
SBT-040 (G1/G2)	HCDR1	3	GYTFTGYY
	HCDR2	4	INPDSGGT

Antibody	Region	SEQ ID NO:	Sequence
	HCDR3	5	ARDQPLGYCTNGVCSYFDY
	LCDR1	8	QGIYSW
	LCDR2	9	TAS
	LCDR3	10	QQANIFPLT
Dacetuzumab	HCDR1	582	GYSFTGYY
	HCDR2	583	VIPNAGGT
	HCDR3	584	AREGIYW
	LCDR1	587	QSLVHSNGNTF
	LCDR2	588	TVS
	LCDR3	589	SQTTHVPWT
Bleselumab	HCDR1	592	GGSISSPGYY
	HCDR2	593	IYKSGST
	HCDR3	594	TRPVVRYFGWFDP
	LCDR1	597	QGISSA
	LCDR2	598	DAS
	LCDR3	599	QQFNSYPT
lucatumumab	HCDR1	602	GFTFSSYG
	HCDR2	603	ISYEESNR
	HCDR3	604	ARDGGIAAPGPDY
	LCDR1	607	QSLLYSNGYNY
	LCDR2	608	LGS
	LCDR3	609	MQARQTPFT
ADC-1013	HCDR1	612	GFTFSTYG
	HCDR2	613	ISGGSSYI
	HCDR3	614	ARILRGGSGMDL
	LCDR1	617	SSNIGAGYN
	LCDR2	618	GNI
	LCDR3	619	AAWDKSISGLV
APX005	HCDR1	622	GFSFSSTY
	HCDR2	623	IYTGDGTN
	HCDR3	624	ARPDITYGFAINFW
	LCDR1	627	QSISSR
	LCDR2	628	RAS
	LCDR3	629	QCTGYGISWP
Chi Lob 7/4	HCDR1	632	GYTFTEYI
	HCDR2	633	IIPNNGGT
	HCDR3	634	TRREVYGRNYYALDY
	LCDR1	637	QGINNY
	LCDR2	638	YTS
	LCDR3	639	QQYSNLPYT
DEC-205 variant 1	HCDR1	234	GFTFSNYG
	HCDR2	235	IWYDGSNK
	HCDR3	236	ARDLWGWYFDY
	LCDR1	239	QSVSSY
	LCDR2	240	DAS
	LCDR3	241	QQRRNWPLT
DEC-205 variant 2	HCDR1	247	GDSFTTYW
	HCDR2	248	IYPGDSDT
	HCDR3	249	TRGDRGVDY
	LCDR1	252	QGISRW
	LCDR2	253	AAS
	LCDR3	254	QQYNSYPRT
DC-SIGN variant 1	HCDR1	640	QHFWNTPWT
	HCDR2	641	QQGHTLPYT
	HCDR3	642	SNDGYYS
	LCDR1	643	RYYLGVD
	LCDR2	644	DDSGRFP
	LCDR3	645	YGYAVDY
DC-SIGN variant 2	HCDR1	646	YYGIYVDY

Antibody	Region	SEQ ID NO:	Sequence
	HCDR2	647	FLVY
	HCDR3	648	NFGILGY
	LCDR1	649	YPNALDY
	LCDR2	650	GLKSFYAMDH
	LCDR3	651	QQGKTLPWT
DC-SIGN variant 3	HCDR1	652	QQGNTLPPT
	HCDR2	653	QQHYITPLT
	HCDR3	654	QQYGNLPYT
	LCDR1	655	QQYYSTPRT
	LCDR2	656	GQSYNYPPT
	LCDR3	657	WQDTHFPHV

TABLE 6. APC Antibody V_H sequences and V_L sequences

Antibody	Region	SEQ ID NO:	Sequence
CP-8709893	V_H	2	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSS
	V_L	7	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
SBT-040	V_H	2	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSS
	V_L	7	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKVEIK
Dacetuzumab	V_H	581	EVQLVESGGGLVQPGGSLRLSCAASGYSFTGYYIHWVRQAPGKGLEWVARVIPNAGGTSYNQKFKGRFTLSVDNSKNTAYLQMNSLRAEDTAVYYCAREGIYWWGQGTLVTVSS
	V_L	586	DIQMTQSPSSLSASVGDRVTITCRSSQSLVHSNGNTFLHWYQQKPGKAPKLLIYTVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFATYFCSQTTHVPWTFGQGTKVEIK
Bleselumab	V_H	591	QLQLQESGPGLLKPSETLSLTCTVSGGSISSPGYYGGWIRQPPGKGLEWIGSIYKSGSTYHNPSLKSRVTISVDTSKNQFSLKLSSVTAADTAVYYCTRPVVRYFGWFDPWGQGTLVTVSS
	V_L	596	AIQLTQSPSSLSASVGDRVTITCRASQGISSALAWYQQKPGKAPKLLIYDASNLESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQFNSYPTFGQGTKVEIK
Lucatumumab	V_H	601	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAVISYEESNRYHADSVKGRFTISRDNSKITLYLQMNSLRTEDTAVYYCARDGGIAAPGPDYWGQGTLVTVSS
	V_L	606	DIVMTQSPLSLTVTPGEPASISCRSSQSLLYSNGYNYLDWYLQKPGQSPQVLISLGSNRASGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCMQARQTPFTFGPGTKVDIR
ADC-1013	V_H	611	EVQLLESGGGLVQPGGSLRLSCAASGFTFSTYGMHWVRQAPGKGLEWLSYISGGSSYIFYADSVRGRFTISRDNSENALYLQMNSLRAEDTAVYYCARILRGGSGMDLWGQGTLVTVSS
	V_L	616	QSVLTQPPSASGTPGQRVTISCTGSSSNIGAGYNVYWYQQLPGTAPKLLIYGNINRPSGVPDRFSGSKSGTSASLAISGLRSEDEADYYCAAWDKSISGLVFGGGTKLTVL
APX005	V_H	621	QVQLVESGGGVVQPGRSLRLSCAASGFSFSSTYVCWVRQAPGKGLEWIACIYTGDGTNYSASWAKGRFTISKDSSKNTVYLQMNSLRAEDTAVYFCARPDITYGFAINFWGPGTLVTVSS
	V_L	626	DIQMTQSPSSLSASVGDRVTIKCQASQSISSRLAWYQQKPGKPPKLLIYRASTLASGVPSRFSGSGSGTDFTLTISSLQPEDVATYYCQCTGYGISWPIGGGTK

Antibody	Region	SEQ ID NO:	Sequence
			VEIK
Chi Lob 7/4	V_H	631	EVQLQQSGPDLVKPGASVKISCKTSGYTFTEYIMHWVKQSHGKSLEWIGGI IPNNGGTSYNQKFKDKATMTVDKSSSTGYMELRSLTSEDSAVYYCTRREV YGRNYYALDYWGQGTLVTVSS
	V_L	636	DIQMTQTTSSLSASLGDRVTITCSASQGINNYLNWYQQKPDGTVKLLIYYTS SLHSGVPSRFSGSGSGTDYSLTISNLEPEDIATYYCQQYSNLPYTFGGGTKLE IK
DEC-205 variant 1	V_H	233	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSS
	V_L	238	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDAS NRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKV EIK
DEC-205 variant 2	V_H	246	EVQLVQSGAEVKKPGESLRISCKGSGDSFTTYWIGWVRQMPGKGLEWMGI IYPGDSDTIYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCTRGDRG VDYWGQGTLVTVSS
	V_L	251	DIQMTQSPSSLSASVGDRVTITCRASQGISRWLAWYQQKPEKAPKSLIYAAS SLQSGVPSRFSGSGSGTDFTLTISGLQPEDFATYYCQQYNSYPRTFGQGTKV EIK
CD36 mannose Scavenger Receptor	V_H	658	DIQMTQSPSSLSASVGDRVTITCRASQGISRWLAWYQQKPEKAPKSLIYAAS SLQSGVPSRFSGSGSGTDFTLTISGLQPEDFATYYCQQYNSYPRTFGQGTKV EIK
	V_L	659	EVQLVQSGAEVKKPGESLRISCKGSGDSFTTYWIGWVRQMPGKGLEWMGI IYPGDSDTIYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCTRGDRG VDYWGQGTLVTVSS
CLEC9A	V_H	660	QIVESGGGLVQPKESLKISCTASGFTFSNAAIYWVRQTPGKGLEWVGRIRTR PSKYATDYADSVRGRFTISRDDSKSMVYLQMDNLRTEDTAMYYCTPRATE DVPFYWGQGVMVTVSS
	V_L	661	DIVMTQTPSSQAVSAGEKVTMNCKSSQSVLYDENKKNYLAWYQQKSGQS PKLLIYWASTGESGVPDRFIGSGSGTDFTLTISSVQAEDLAVYYCQQYYDFP PTFGGGTK

TABLE 7. APC Antibody Heavy Chain and Light Chain sequences

Antibody	Region	SEQ ID NO:	Sequence
CP-8709893	Heavy Chain	1	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWM GWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCAR DQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSVFPLAPCSRSTSESTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSS NFGTQTYTCNVDHKPSNTKVDKTVERKCCVECPPCPAPPVAGPSVFLFPPK PKDTLMISRTPEVTCVVVDVSHEDPEVQFNWYVDGVEVHNAKTKPREEQF NSTFRVVSVLTVVHQDWLNGKEYKCKVSNKGLPAPIEKTISKTKGQPREPQ VYTLPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPML DSDGSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	6	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTA STLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
SBT-040	Heavy Chain (IgG1)	577	MDWTWRILFLVAAATGAHSQVQLVQSGAEVKKPGASVKVSCKASGYTFT GYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSIST AYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSA STKGPSVFPLAPCSRSTSESTAALGCLVKDYFPEPVTVSWNSGALTSGVHTF PAVLQSSGLYSLSSVVTVPSSNFGTQTYTCNVDHKPSNTKVDKTVEPKSCD KTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEV KFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC

Antibody	Region	SEQ ID NO:	Sequence
			KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFY PSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQQGNVFS CSVMHEALHNHYTQKSLSLSPGK
	Heavy Chain (IgG2)	578	MDWTWRILFLVAAATGAHSQVQLVQSGAEVKKPGASVKVSCKASGYTFT GYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKFQGRVTMTRDTSIST AYMELNRLRSDDTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSA STKGPSVFPLAPCSRSTSESTAALGCLVKDYFPEPVTVSWNSGALTSGVHTF PAVLQSSGLYSLSSVVTVPSSNFGTQTYTCNVDHKPSNTKVDKTVERKCCV ECPPCPAPPVAGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVQFNW YVDGVEVHNAKTKPREEQFNSTFRVVSVLTVVHQDWLNGKEYKCKVSNK GLPAPIEKTISKTKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGFYPSDIA VEWESNGQPENNYKTTPPMLDSDGSFFLYSKLTVDKSRWQQGNVFSCSVM HEALHNHYTQKSLSLSPGK
	Light Chain	579	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTA STLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
Dacetuzumab	Heavy Chain	580	EVQLVESGGGLVQPGGSLRLSCAASGYSFTGYYIHWVRQAPGKGLEWVAR VIPNAGGTSYNQKFKGRFTLSVDNSKNTAYLQMNSLRAEDTAVYYCAREG IYWWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPV TVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKP SNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPE VTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLT VLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEM TKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSK LTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	585	DIQMTQSPSSLSASVGDRVTITCRSSQSLVHSNGNTFLHWYQQKPGKAPKL LIYTVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFATYFCSQTTHVPWTFG QGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKV DNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQG LSSPVTKSFNRGEC
Bleselumab	Heavy Chain	590	QLQLQESGPGLLKPSETLSLTCTVSGGSISSPGYYGGWIRQPPGKGLEWIGSI YKSGSTYHNPSLKSRVTISVDTSKNQFSLKLSSVTAADTAVYYCTRPVVRY FGWFDPWGQGTLVTVSSASTKGPSVFPLAPCSRSTSESTAALGCLVKDYFP EPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTKTYTCNV DHKPSNTKVDKRVESKYGPPCPPCPAPEFEGGPSVFLFPPKPKDTLMISRTP EVTCVVVDVSQEDPEVQFNWYVDGVEVHNAKTKPREEQFNSTYRVVSVL TVLHQDWLNGKEYKCKVSNKGLPSSIEKTISKAKGQPREPQVYTLPPSQEE MTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYS RLTVDKSRWQEGNVFSCSVMHEALHNHYTQKSLSLSLGK
	Light Chain	595	AIQLTQSPSSLSASVGDRVTITCRASQGISSALAWYQQKPGKAPKLLIYDAS NLESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQFNSYPTFGQGTKVEI KRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSG NSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKS FNRGEC
Lucatumumab	Heavy Chain	600	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVA VISYEESNRYHADSVKGRFTISRDNSKITLYLQMNSLRTEDTAVYYCARDG GIAAPGPDYWGQGTLVTVSSASTKGPSVFPLAPASKSTSGGTAALGCLVKD YFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYIC NVNHKPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTL MISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYR VVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLP PSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	605	DIVMTQSPLSLTVTPGEPASISCRSSQSLLYSNGYNYLDWYLQKPGQSPQVL ISLGSNRASGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCMQARQTPFTFG PGTKVDIRRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKV

Antibody	Region	SEQ ID NO:	Sequence
			DNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQG LSSPVTKSFNRGEC
ADC-1013	Heavy Chain	610	EVQLLESGGGLVQPGGSLRLSCAASGFTFSTYGMHWVRQAPGKGLEWLSY ISGGSSYIFYADSVRGRFTISRDNSENALYLQMNSLRAEDTAVYYCARILRG GSGMDLWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFP EPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSWTVPSSSLGTQTYICNVN HKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISR TPEVTCNAVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRWSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRD ELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK	
	Light Chain	615	QSVLTQPPSASGTPGQRVTISCTGSSSNIGAGYNVYWYQQLPGTAPKLLIYG NINRPSGVPDRFSGSKSGTSASLAISGLRSEDEADYYCAAWDKSISGLVFGG GTKLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLISDFYPGAVTVAWKA DSSPVKAGVETTTPSKQSNNKYAASSYLSLTPEQWKSHRSYSCQVTHEGST VEKTVAPTECS
APX005	Heavy Chain	620	QVQLVESGGGVVQPGRSLRLSCAASGFSFSSTYVCWVRQAPGKGLEWIACI YTGDGTNYSASWAKGRFTISKDSSKNTVYLQMNSLRAEDTAVYFCARPDI TYGFAINFWGPGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYF PEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNV NHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMIS RTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVV SVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPS REEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFF LYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	625	DIQMTQSPSSLSASVGDRVTIKCQASQSISSRLAWYQQKPGKPPKLLIYRAS TLASGVPSRFSGSGSGTDFTLTISSLQPEDVATYYCQCTGYGISWPIGGGTK VEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNAL QSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPV TKSFNRGEC
Chi Lob 7/4	Heavy Chain	630	EVQLQQSGPDLVKPGASVKISCKTSGYTFTEYIMHWVKQSHGKSLEWIGGI IPNNGGTSYNQKFKDKATMTVDKSSSTGYMELRSLTSEDSAVYYCTRREV YGRNYYALDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTY ICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	635	DIQMTQTTSSLSASLGDRVTITCSASQGINNYLNWYQQKPDGTVKLLIYYTS SLHSGVPSRFSGSGSGTDYSLTISNLEPEDIATYYCQQYSNLPYTFGGGTKLE IKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQS GNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
DEC-205 (variant 1)	Heavy Chain	232	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYI CNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSREEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	237	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDAS NRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT

Antibody	Region	SEQ ID NO:	Sequence
			KSFNRGEC
DEC-205 (variant 2)	Heavy Chain	245	EVQLVQSGAEVKKPGESLRISCKGSGDSFTTYWIGWVRQMPGKGLEWMGI IYPGDSDTIYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCTRGDRG VDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEPV TVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKP SNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPE VTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLT VLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEM TKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSK LTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	250	DIQMTQSPSSLSASVGDRVTITCRASQGISRWLAWYQQKPEKAPKSLIYAAS SLQSGVPSRFSGSGSGTDFTLTISGLQPEDFATYYCQQYNSYPRTFGQGTKV EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC
CLEC12A	Heavy Chain variant 1	662	QVQLQESGPGLVKPSETLSLTCVVSGGSISSSNWWSWVRQPPGKGLEWIGE IYHSGSPDYNPSLKSRVTISVDKSRNQFSLKLSSVTAADTAVYYCAKVSTG GFFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNH KPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRT PEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Heavy Chain variant 2	663	QVQLQESGPGLVKPSETLSLTCVVSGGSISSSNWWSWVRQPPGKGLEWIGE IYHSGSPNYNPSLKSRVTISVDKSKNQFSLKLSSVTAADTAVYYCARSSSGG FFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPEP VTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNH KPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRT PEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Heavy Chain variant 3	664	QVQLQESGPGLVKPSETLSLTCVVSGGSISSSNWWSWVRQPPGKGLEWIGE IYHSGSPNYNPSLKSRVTISVDKSKNQFSLKLSSVTAADTAVYYCARQTTA GSFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVKDYFPE PVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNH KPSNTKVDKRVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRT PEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSV LTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLY SKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	665	DIQMTQSPSSLSASVGDRVTITCRASQSISSYLNWYQQKPGKAPKLLIYAAS SLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQSYSTPPTFGQGTKVE IKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQS GNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTK SFNRGEC
BDCA-2 Variant 1	Heavy Chain	666	QVQLVESGGGVVQPGRSLRLSCAASGFTLSSYGMHWVRQAPGKGLEWVA VIWYDGNDKYYADSVKGRFTISRDNSKNTLYLQVNSLRAEDTAVYYCAR GTGTPYWYFDLWGRGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLV KDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTY ICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	669	EIVLTQSPATLSLSPGERATLSCRASQSVNNYLAWYQQKPGQAPRLLIYDAS NRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSTWPPYTFGQGTK LEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNAL

Antibody	Region	SEQ ID NO:	Sequence
			QSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPV TKSFNRGEC
BDCA-2 Variant 2	Heavy Chain	667	EVQLVESGGGLVQPGGSLRLSCAASGFTFSNYLMNWVRQAPGKGLEWVA NIEQDGSEKYYVDSVKGRFTISRDNAKNSLYLQMNSLRAEDTAVYFCARD GDTAMITFDFWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYI CNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	670	DIQMTQSPSSVSASVGDRVTITCRASQGIRRWLAWYQQKPGKAPKLLIYAA SSLQRGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANSFPWTFGQGTK VEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNAL QSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPV TKSFNRGEC
BDCA-2 Variant 3	Heavy Chain	668	QVQLQESGPGLVKPSQTLSLTCTVSGGSISSGGYYWNWIRQHPGKGLEWIG YIYYSGNTYYNPSLKSRVTISVDTSKNQFSLKLSSVTAADAAVYHCARGYG DYGGGYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAALGCLVK DYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTVPSSSLGTQTYI CNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDT LMISRTPEVTCVVVDVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTY RVVSVLTVLHQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYT LPPSRDELTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGK
	Light Chain	671	DIQMTQSPSSLSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKFLIYDVS NLETGVPSRFSGSGSGTDFTFTISSLQPEDIATYYCQQYDNLPYTFGQGTKL EIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQ SGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVT KSFNRGEC

TABLE 8. Fusion Sequences – DEC-205 fusions via the heavy chain

Antibody	Region	SEQ ID NO:	Sequence
Pertuzumab	HC DEC-205 mAb with tumor mAb ScFv	505	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLE WVADVNPNSGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDT AVYYCARNLGPSFYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSDIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGK APKLLIYSASYRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ YYIYPYTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	506	EVQLVESGGGLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGL EWVADVNPNSGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAED TAVYYCARNLGPSFYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP

Antibody	Region	SEQ ID NO:	Sequence
			PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
	LC tumor mAb containing CD40 mab scFv (LH)	846	DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKL LIYSASYRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIY PYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSDIQMTQSPS SVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQ SGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTK VEIKGGGGSGGGGSGGGGSGGGGSQVQLVQSGAEVKKPGASVKVS CKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKF QGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGV CSYFDYWGQGTLVTVSS
Cetuximab	HC DEC-205 mAb with tumor mAb ScFv	507	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLKQSGPGLVQPSQSLSITCTVSGFSLTNYGVHWVRQSPGKGLEW LGVIWSGGNTDYNTPFTSRLSINKDNSKSQVFFKMNSLQSNDTAIYY CARALTYYDYEFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGG SDILLTQSPVILSVSPGERVSFSCRASQSIGTNIHWYQQRTNGSPRLLI KYASESISGIPSRFSGSGSGTDFTLSINSVESEDIADYYCQQNNNWPT TFGAGTKLELK
	HC tumor mAb with DEC-205 mAb ScFv	508	QVQLKQSGPGLVQPSQSLSITCTVSGFSLTNYGVHWVRQSPGKGLE WLGVIWSGGNTDYNTPFTSRLSINKDNSKSQVFFKMNSLQSNDTAI YYCARALTYYDYEFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSL SSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPC PAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYK CKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTC LVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVD KSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQV QLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Panitumumab	HC DEC-205 mAb with tumor mAb ScFv	509	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP

Antibody	Region	SEQ ID NO:	Sequence
			PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLQESGPGLVKPSETLSLTCTVSGGSVSSGDYYWTWIRQSPGKGL EWIGHIYYSGNTNYNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAIY YCVRDRVTGAFDIWGQGTMVTVSSGGGGSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKL LIYDASNLETGVPSRFSGSGSGTDFTFTISSLQPEDIATYFCQHFDHLP LAFGGGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	510	QVQLQESGPGLVKPSETLSLTCTVSGGSVSSGDYYWTWIRQSPGKG LEWIGHIYYSGNTNYNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAI YYCVRDRVTGAFDIWGQGTMVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCL VKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDK SRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK
Nimotuzumab	HC DEC-205 mAb with tumor mAb ScFv	511	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLQQSGAEVKKPGSSVKVSCKASGYTFTNYYIYWVRQAPGQGLE WIGGINPTSGGSNFNEKFKTRVTITVDESTNTAYMELSSLRSEDTAF YFCARQGLWFDSDGRGFDFWGQGSTVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSLSASVGDRVTITCRSSQNIVHSNGNTYLDWY QQTPGKAPKLLIYKVSNRFSGVPSRFSGSGSGTDFTFTISSLQPEDIAT YYCFQYSHVPWTFGQGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	512	QVQLQQSGAEVKKPGSSVKVSCKASGYTFTNYYIYWVRQAPGQGL EWIGGINPTSGGSNFNEKFKTRVTITVDESTNTAYMELSSLRSEDTAF YFCARQGLWFDSDGRGFDFWGQGSTVTVSSASTKGPSVFPLAPSSK STSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGL YSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTC PPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSL TCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK

Antibody	Region	SEQ ID NO:	Sequence
Zalutumumab	HC DEC-205 mAb with tumor mAb ScFv	513	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSTYGMHWVRQAPGKGLE WVAVIWDDGSYKYYGDSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDGITMVRGVMKDYFDYWGQGTLVTVSSGGGGSGGGGS GGGGSGGGGSAIQLTQSPSSLSASVGDRVTITCRASQDISSALVWYQ QKPGKAPKLLIYDASSLESGVPSRFSGSESGTDFTLTISSLQPEDFATY YCQQFNSYPLTFGGGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	514	QVQLVESGGGVVQPGRSLRLSCAASGFTFSTYGMHWVRQAPGKGL EWVAVIWDDGSYKYYGDSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDGITMVRGVMKDYFDYWGQGTLVTVSSASTKGPSVFP LAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAV LQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSC DKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVS HEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ DWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREE MTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGG GGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWV RQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQ MNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGG GGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLA WYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPED FAVYYCQQRRNWPLTFGGGTKVEIK
Onartuzumab	HC DEC-205 mAb with tumor mAb ScFv	515	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLVESGGGLVQPGGSLRLSCAASGYTFTSYWLHWVRQAPGKGLE WVGMIDPSNSDTRFNPNFKDRFTISADTSKNTAYLQMNSLRAEDTA VYYCATYRSYVTPLDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSDIQMTQSPSSLSASVGDRVTITCKSSQSLLYTSSQKNYLAWYQQ KPGKAPKLLIYWASTRESGVPSRFSGSGSGTDFTLTISSLQPEDFATY YCQQYYAYPWTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	516	EVQLVESGGGLVQPGGSLRLSCAASGYTFTSYWLHWVRQAPGKGL EWVGMIDPSNSDTRFNPNFKDRFTISADTSKNTAYLQMNSLRAEDT AVYYCATYRSYVTPLDYWGQGTLVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE

Antibody	Region	SEQ ID NO:	Sequence
			WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Patritumab	HC DEC-205 mAb with tumor mAb ScFv	517	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLQQWGAGLLKPSETLSLTCAVYGGSFSGYYWSWIRQPPGKGLE WIGEINHSGSTNYNPSLKSRVTISVETSKNQFSLKLSSVTAADTAVY YCARDKWTWYFDLWGRGTLVTVSSGGGGSGGGGSGGGGSGGGGS DIEMTQSPDSLAVSLGERATINCRSSQSVLYSSSNRNYLAWYQQNP GQPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYY CQQYYSTPRTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	518	QVQLQQWGAGLLKPSETLSLTCAVYGGSFSGYYWSWIRQPPGKGL EWIGEINHSGSTNYNPSLKSRVTISVETSKNQFSLKLSSVTAADTAV YYCARDKWTWYFDLWGRGTLVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCL VKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDK SRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK
Clivatuzumab	HC DEC-205 mAb with tumor mAb ScFv	519	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLQQSGAEVKKPGASVKVSCEASGYTFPSYVLHWVKQAPGQGLE WIGYINPYNDGTQYNEKFKGKATLTRDTSINTAYMELSRLRSDDTA VYYCARGFGGSYGFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSDIQLTQSPSSLSASVGDRVTMTCSASSSVSSSYLYWYQQKPGK APKLWIYSTSNLASGVPARFSGSGSGTDFTLTISSLQPEDSASYFCHQ WNRYPYTFGGGTRLEIK
	HC tumor mAb with DEC-205 mAb ScFv	520	QVQLQQSGAEVKKPGASVKVSCEASGYTFPSYVLHWVKQAPGQGL EWIGYINPYNDGTQYNEKFKGKATLTRDTSINTAYMELSRLRSDDT AVYYCARGFGGSYGFAYWGQGTLVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF

Antibody	Region	SEQ ID NO:	Sequence
			NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Sofituzumab	HC DEC-205 mAb with tumor mAb ScFv	521	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLVESGGGLVQPGGSLRLSCAASGYSITNDYAWNWVRQAPGKGL EWVGYISYSGYTTYNPSLKSRFTISRDTSKNTLYLQMNSLRAEDTAV YYCARWTSGLDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSD IQMTQSPSSLSASVGDRVTITCKASDLIHNWLAWYQQKPGKAPKLLI YGATSLETGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYWTTP FTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	522	EVQLVESGGGLVQPGGSLRLSCAASGYSITNDYAWNWVRQAPGKG LEWVGYISYSGYTTYNPSLKSRFTISRDTSKNTLYLQMNSLRAEDTA VYYCARWTSGLDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGT AALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWY VDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCK VSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLV KGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSR WQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQL VESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWV AVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAV YYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGG GSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPR LLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
Edrecolomab	HC DEC-205 mAb with tumor mAb ScFv	523	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWVKQRPGQGLE WIGVINPGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSA VYFCARDGPWFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGGS NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPK LLIYGASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGY SYPYTFGGGTKLEIK
	HC tumor	524	QVQLQQSGAELVRPGTSVKVSCKASGYAFTNYLIEWVKQRPGQGL

Antibody	Region	SEQ ID NO:	Sequence
	mAb with DEC-205 mAb ScFv		EWIGVINPGSGGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDS AVYFCARDGPWFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCL VKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDK SRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK
Adecatumumab	HC DEC-205 mAb with tumor mAb ScFv	525	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLLESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLE WVAVISYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCAKDMGWGSGWRPYYYYGMDVWGQGTTVTVSSGGGGSG GGGSGGGGSGGGGSELQMTQSPSSLSASVGDRVTITCRTSQSISSYL NWYQQKPGQPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQP EDSATYYCQQSYDIPYTFGQGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	526	EVQLLESGGGVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGL EWVAVISYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCAKDMGWGSGWRPYYYYGMDVWGQGTTVTVSSASTKGP SVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTF PAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEP KSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVV DVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVL HQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPG GGGGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMY WVRQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTL YLQMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGG SGGGGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSS YLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSL EPEDFAVYYCQQRRNWPLTFGGGTKVEIK
Anetumab	HC DEC-205 mAb with tumor mAb ScFv	527	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VELVQSGAEVKKPGESLKISCKGSGYSFTSYWIGWVRQAPGKGLE WMGIIDPGDSRTRYSPSFQGQVTISADKSISTAYLQWSSLKASDTAM

Antibody	Region	SEQ ID NO:	Sequence
			YYCARGQLYGGTYMDGWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSDIALTQPASVSGSPGQSITISCTGTSSDIGGYNSVSWYQQHPGK APKLMIYGVNNRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYCS SYDIESATPVFGGGTKLTVL
	HC tumor mAb with DEC-205 mAb ScFv	528	QVELVQSGAEVKKPGESLKISCKGSGYSFTSYWIGWVRQAPGKGLE WMGIIDPGDSRTRYSPSFQGQVTISADKSISTAYLQWSSLKASDTAM YYCARGQLYGGTYMDGWGQGTLVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
huDS6	HC DEC-205 mAb with tumor mAb ScFv	529	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ AQLVQSGAEVVKPGASVKMSCKASGYTFTSYNMHWVKQTPGQGL EWIGYIYPGNGATNYNQKFQGKATLTADPSSSTAYMQISSLTSEDSA VYFCARGDSVPFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGG SEIVLTQSPATMSASPGERVTITCSAHSSVSFMHWFQQKPGTSPKLW IYSTSSLASGVPARFGGSGSGTSYSLTISSMEAEDAATYYCQQRSSFP LTFGAGTKLELK
	HC tumor mAb with DEC-205 mAb ScFv	530	QAQLVQSGAEVVKPGASVKMSCKASGYTFTSYNMHWVKQTPGQG LEWIGYIYPGNGATNYNQKFQGKATLTADPSSSTAYMQISSLTSEDS AVYFCARGDSVPFAYWGQGTLVTVSAASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCL VKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDK SRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK
Lifastuzumab	HC DEC-205 mAb with tumor mAb ScFv	531	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY

Antibody	Region	SEQ ID NO:	Sequence
			KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLVESGGGLVQPGGSLRLSCAASGFSFSDFAMSWVRQAPGKGLE WVATIGRVAFHTYYPDSMKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARHRGFDVGHFDFWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSDIQMTQSPSSLSASVGDRVTITCRSSETLVHSSGNTYLEWYQ QKPGKAPKLLIYRVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCFQGSFNPLTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	532	EVQLVESGGGLVQPGGSLRLSCAASGFSFSDFAMSWVRQAPGKGLE WVATIGRVAFHTYYPDSMKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARHRGFDVGHFDFWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Sacituzumab	HC DEC-205 mAb with tumor mAb ScFv	533	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLQQSGSELKKPGASVKVSCKASGYTFTNYGMNWVKQAPGQGL KWMGWINTYTGEPTYTDDFKGRFAFSLDTSVSTAYLQISSLKADDT AVYFCARGGFGSSYWYFDVWGQGSLVTVSSGGGGSGGGGSGGGG SGGGGSDIQLTQSPSSLSASVGDRVSITCKASQDVSIAVAWYQQKPG KAPKLLIYSASYRYTGVPDRFSGSGSGTDFTLTISSLQPEDFAVYYCQ QHYITPLTFGAGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	534	QVQLQQSGSELKKPGASVKVSCKASGYTFTNYGMNWVKQAPGQG LKWMGWINTYTGEPTYTDDFKGRFAFSLDTSVSTAYLQISSLKADD TAVYFCARGGFGSSYWYFDVWGQGSLVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSG LYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHT CPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEV KFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGK EYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVS LTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLT VDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGS QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQ APRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQ RRNWPLTFGGGTKVEIK
PR1A3	HC DEC-205 mAb with	535	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED

Antibody	Region	SEQ ID NO:	Sequence
	tumor mAb ScFv		TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VKLQQSGPELKKPGETVKISCKASGYTFTEFGMNWVKQAPGKGLK WMGWINTKTGEATYVEEFKGRFAFSLETSATTAYLQINNLKNEDTA KYFCARWDFYDYVEAMDYWGQGTTVTVSSGGGGSGGGGSGGGG SGGGGSDIVMTQSQRFMSTSVGDRVSVTCKASQNVGTNVAWYQQ KPGQSPKALIYSASYRYSGVPDRFTGSGSGTDFTLTISNVQSEDLAE YFCHQYYTYPLFTFGSGTKLEMK
	HC tumor mAb with DEC-205 mAb ScFv	536	QVKLQQSGPELKKPGETVKISCKASGYTFTEFGMNWVKQAPGKGL KWMGWINTKTGEATYVEEFKGRFAFSLETSATTAYLQINNLKNEDT AKYFCARWDFYDYVEAMDYWGQGTTVTVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSG LYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHT CPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEV KFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGK EYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVS LTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLT VDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGS QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQ APRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQ RRNWPLTFGGGTKVEIK
Humanized PR1A3	HC DEC-205 mAb with tumor mAb ScFv	818	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSL TCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGS QVQLVQSGAEVKKPGASVKVSCKASGYTFTEFGMNWVRQAPGQG LEWMGWINTKTGEATYVEEFKGRVTFTTDTSTSTAYMELRSLRSD DTAVYYCARWDFAYYVEAMDYWGQGTTVTVSSGGGGSGGGGSG GGGSGGGGSDIQMTQSPSSLSASVGDRVTITCKASAAVGTYVAWY QQKPGKAPKLLIYSASYRKRGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCHQYYTYPLFTFGQGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	819	QVQLVQSGAEVKKPGASVKVSCKASGYTFTEFGMNWVRQAPGQG LEWMGWINTKTGEATYVEEFKGRVTFTTDTSTSTAYMELRSLRSD DTAVYYCARWDFAYYVEAMDYWGQGTTVTVSSASTKGPSVFPLA PSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQ SSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDK THTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHE DPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDW LNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTK NQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFL YSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGS GGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQ APGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQM NSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGG

Antibody	Region	SEQ ID NO:	Sequence
			GSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAW YQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDF AVYYCQQRRNWPLTFGGGTKVEIK
Humanized Ab2-3	HC DEC-205 mAb with tumor mAb ScFv	836	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSL TCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLQESGPGLVKPGGSLSLSCAASGFVFSSYDMSWVRQTPERGLEW VAYISSGGGITYAPSTVKGRFTVSRDNAKNTLYLQMNSLTSEDTAV YYCAAHYFGSSGPFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSDIQMTQSPASLSASVGDRVTITCRASENIFSYLAWYQQKPGKSP KLLVYNTRTLAEGVPSRFSGSGSGTDFSLTISSLQPEDFATYYCQHH YGTPFTFGSGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	837	EVQLQESGPGLVKPGGSLSLSCAASGFVFSSYDMSWVRQTPERGLE WVAYISSGGGITYAPSTVKGRFTVSRDNAKNTLYLQMNSLTSEDTA VYYCAAHYFGSSGPFAYWGQGTLVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGS QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQ APRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQ RRNWPLTFGGGTKVEIK
IMAB362, CLAUDIXIMAB	HC DEC-205 mAb with tumor mAb ScFv	537	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLQQPGAELVRPGASVKLSCKASGYTFTSYWINWVKQRPGQGLE WIGNIYPSDSYTNYNQKFKDKATLTVDKSSSTAYMQLSSPTSEDSA VYYCTRSWRGNSFDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGG GSDIVMTQSPSSLTVTAGEKVTMSCKSSQSLLNSGNQKNYLTWYQQ KPGQPPKLLIYWASTRESGVPDRFTGSGSGTDFTLTISSVQAEDLAV YYCQNDYSYPFTFGSGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	538	QVQLQQPGAELVRPGASVKLSCKASGYTFTSYWINWVKQRPGQGL EWIGNIYPSDSYTNYNQKFKDKATLTVDKSSSTAYMQLSSPTSEDSA VYYCTRSWRGNSFDYWGQGTTLTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCL

Antibody	Region	SEQ ID NO:	Sequence
			VKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDK SRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK
AMG595	HC DEC-205 mAb with tumor mAb ScFv	539	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQSGRSLRLSCAASGFTFRNYGMHWVRQAPGKGLE WVAVIWYDGSDKYYADSVRGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDGYDILTGNPRDFDYWGQGTLVTVSSGGGGSGGGGSG GGGSGGGGSDTVMTQTPLSSHVTLGQPASISCRSSQSLVHSDGNTY LSWLQQRPGQPPRLLIYRISRRFSGVPDRFSGSGAGTDFTLEISRVEA EDVGVYYCMQSTHVPRTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	540	QVQLVESGGGVVQSGRSLRLSCAASGFTFRNYGMHWVRQAPGKG LEWVAVIWYDGSDKYYADSVRGRFTISRDNSKNTLYLQMNSLRAE DTAVYYCARDGYDILTGNPRDFDYWGQGTLVTVSSASTKGPSVFPL APSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVL QSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCD KTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHE DPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDW LNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTK NQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFL YSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGS GGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQ APGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMN SLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGS GGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQ QKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAV YYCQQRRNWPLTFGGGTKVEIK
ABT806	HC DEC-205 mAb with tumor mAb ScFv	541	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLQESGPGLVKPSQTLSLTCTVSGYSISRDFAWNWIRQPPGKGLE WMGYISYNGNTRYQPSLKSRITISRDTSKNQFFLKLNSVTAADTATY YCVTASRGFPYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQ MTQSPSSMSVSVGDRVTITCHSSQDINSNIGWLQQKPGKSFKGLIYH GTNLDDGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCVQYAQFPWT FGGGTKLEIK
	HC tumor mAb with DEC-205 mAb	542	EVQLQESGPGLVKPSQTLSLTCTVSGYSISRDFAWNWIRQPPGKGLE WMGYISYNGNTRYQPSLKSRITISRDTSKNQFFLKLNSVTAADTATY YCVTASRGFPYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGTAAL

Antibody	Region	SEQ ID NO:	Sequence
	ScFv		GCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVVTV PSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPELL GGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYVDG VEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKVSN KALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVKGF YPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSRWQ QGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQLVES GGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVI WYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEI VLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIY DASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPL TFGGGTKVEIK
Sibrotuzumab	HC DEC-205 mAb with tumor mAb ScFv	543	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKTSRYTFTEYTIHWVRQAPGQRLE WIGGINPNNGIPNYNQKFKGRVTITVDTSASTAYMELSSLRSEDTAV YYCARRRIAYGYDEGHAMDYWGQGTLVTVSSGGGGSGGGGSGGG GSGGGGSDIVMTQSPDSLAVSLGERATINCKSSQSLLYSRNQKNYL AWYQQKPGQPPKLLIFWASTRESGVPDRFSGSGFGTDFTLTISSLQA EDVAVYYCQQYFSYPLTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	544	QVQLVQSGAEVKKPGASVKVSCKTSRYTFTEYTIHWVRQAPGQRL EWIGGINPNNGIPNYNQKFKGRVTITVDTSASTAYMELSSLRSEDTA VYYCARRRIAYGYDEGHAMDYWGQGTLVTVSSASTKGPSVFPLAP SSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQS SGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKT HTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDP EVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLN GKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQ VSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSK LTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGG GSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGK GLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRA EDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGG GSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKP GQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYC QQRRNWPLTFGGGTKVEIK
DS-8895a variant 1	HC DEC-205 mAb with tumor mAb ScFv	545	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLE WMGWINTYTGEPTYSDDFKGRVTITADTSTSTAYLELSSLRSEDTA VYYCATYYRYERDFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSDIVMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKP

Antibody	Region	SEQ ID NO:	Sequence
			GQSPQLLIYKVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYY CFQGSHVPYTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	546	QVQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQG LEWMGWINTYTGEPTYSDDFKGRVTITADTSTSTAYLELSSLRSEDT AVYYCATYYRYERDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
DS-8895a variant 2	HC DEC-205 mAb with tumor mAb ScFv	547	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ IQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLK WMGWINTYTGEPTYSDDFKGRFAFSLDTSTSTAYLELSSLRSEDTA VYYCATYYRYERDFDYWGQGTLVTVSSGGGGSGGGGSGGGSGGG GSDVLMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPG QSPQLLIYKVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYC FQGSHVPYTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	548	QIQLVQSGAEVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGL KWMGWINTYTGEPTYSDDFKGRFAFSLDTSTSTAYLELSSLRSEDT AVYYCATYYRYERDFDYWGQGTLVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPP CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGSGG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
MEDI-547	HC DEC-205 mAb with tumor mAb ScFv	549	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV

Antibody	Region	SEQ ID NO:	Sequence
			DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLLESGGGLVQPGGSLRLSCAASGFTFSHYMMAWVRQAPGKGLE WVSRIGPSGGPTHYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCAGYDSGYDYVAVAGPAEYFQHWGQGTLVTVSSGGGGSGGG GSGGGGSGGGGSDIQMTQSPSSLSASVGDRVTITCRASQSISTWLAW YQQKPGKAPKLLIYKASNLHTGVPSRFSGSGSGTEFSLTISGLQPDDF ATYYCQQYNSYSRTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	550	EVQLLESGGGLVQPGGSLRLSCAASGFTFSHYMMAWVRQAPGKGL EWVSRIGPSGGPTHYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCAGYDSGYDYVAVAGPAEYFQHWGQGTLVTVSSASTKGPS VFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFP AVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPK SCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVD VSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLH QDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSRE EMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDG SFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGG GGGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYW VRQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYL QMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSG GGGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYL AWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPE DFAVYYCQQRRNWPLTFGGGTKVEIK
Narnatumab	HC DEC-205 mAb with tumor mAb ScFv	551	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLVESGGGLVQPGGSLRLSCAASGFTFSSYLMTWVRQAPGKGLE WVANIKQDGSEKYYVDSVKGRFTISRDNAKNSLNLQMNSLRAEDT AVYYCTRDGYSSGRHYGMDVWGQGTTVIVSSGGGGSGGGGSGGG GSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSRYLAWYQQKP GQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYC QQRSNWPRTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	552	EVQLVESGGGLVQPGGSLRLSCAASGFTFSSYLMTWVRQAPGKGLE WVANIKQDGSEKYYVDSVKGRFTISRDNAKNSLNLQMNSLRAEDT AVYYCTRDGYSSGRHYGMDVWGQGTTVIVSSASTKGPSVFPLAPSS KSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSG LYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHT CPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEV KFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGK EYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVS LTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLT VDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGS QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQ APRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQ RRNWPLTFGGGTKVEIK
RG7841	HC DEC-205 mAb with tumor mAb ScFv	553	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY

Antibody	Region	SEQ ID NO:	Sequence
			SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLVESGPALVKPTQTLTLTCTVSGFSLTGYSVNWIRQPPGKALEW LGMIWGDGSTDYNSALKSRLTISKDTSKNQVVLTMTNMDPVDTAT YYCARDYYFNYASWFAYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSDIQMTQSPSSLSASVGDRVTITCSASQGISNYLNWYQQKPGKT VKLLIYYTSNLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQY SELPWTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	554	EVQLVESGPALVKPTQTLTLTCTVSGFSLTGYSVNWIRQPPGKALE WLGMIWGDGSTDYNSALKSRLTISKDTSKNQVVLTMTNMDPVDTA TYYCARDYYFNYASWFAYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Farletuzumab	HC DEC-205 mAb with tumor mAb ScFv	555	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLVESGGGVVQPGRSLRLSCSASGFTFSGYGLSWVRQAPGKGLE WVAMISSGGSYTYYADSVKGRFAISRDNAKNTLFLQMDSLRPEDTG VYFCARHGDDPAWFAYWGQGTPVTVSSGGGGSGGGGSGGGGSGG GGSDIQLTQSPSSLSASVGDRVTITCSVSSSISSNNLHWYQQKPGKAP KPWIYGTSNLASGVPSRFSGSGSGTDYTFTISSLQPEDIATYYCQQW SSYPYMYTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	556	EVQLVESGGGVVQPGRSLRLSCSASGFTFSGYGLSWVRQAPGKGLE WVAMISSGGSYTYYADSVKGRFAISRDNAKNTLFLQMDSLRPEDTG VYFCARHGDDPAWFAYWGQGTPVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSL SSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPC PAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYK CKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTC LVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVD KSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQV QLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR

Antibody	Region	SEQ ID NO:	Sequence
			RNWPLTFGGGTKVEIK
Mirvetuximab	HC DEC-205 mAb with tumor mAb ScFv	557	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVQSGAEVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSLE WIGRIHPYDGDTFYNQKFQGKATLTVDKSSNTAHMELLSLTSEDFA VYYCTRYDGSRAMDYWGQGTTVTVSSGGGGSGGGGSGGGGSGGG GSDIVLTQSPLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPG QQPRLLIYRASNLEAGVPDRFSGSGSKTDFTLTISPVEAEDAATYYC QQSREYPYTFGGGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	558	QVQLVQSGAEVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSL EWIGRIHPYDGDTFYNQKFQGKATLTVDKSSNTAHMELLSLTSEDF AVYYCTRYDGSRAMDYWGQGTTVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSL SSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPC PAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYK CKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTC LVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVD KSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQV QLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
J591 variant1	HC DEC-205 mAb with tumor mAb ScFv	559	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLQQSGPELKKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWI GNINPNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVY YCAAGWNFDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGGGSDIV MTQSHKFMSTSVGDRVSIICKASQDVGTAVDWYQQKPGQSPKLLIY WASTRHTGVPDRFTGSGSGTDFTLTITNVQSEDLADYFCQQYNSYP LTFGAGTMLDLK
	HC tumor mAb with DEC-205 mAb ScFv	560	EVQLQQSGPELKKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLE WIGNINPNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSA VYYCAAGWNFDYWGQGTTLTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVV TVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKV SNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVK GFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSR WQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQL

Antibody	Region	SEQ ID NO:	Sequence
			VESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWV AVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAV YYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGG GSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPR LLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
J591 variant 2	HC DEC-205 mAb with tumor mAb ScFv	561	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLQQSGPELVKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWI GNINPNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVY YCAAGWNFDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGGGSNIV MTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLI YGASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSY PYTFGGGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	562	EVQLQQSGPELVKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLE WIGNINPNNGGTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSA VYYCAAGWNFDYWGQGTTLTVSSASTKGPSVFPLAPSSKSTSGGTA ALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSVV TVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAPE LLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWYV DGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCKV SNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLVK GFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSR WQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQL VESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWV AVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAV YYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGG GSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPR LLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
Rovalpituzumab	HC DEC-205 mAb with tumor mAb ScFv	563	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQGL EWMGWINTYTGEPTYADDFKGRVTMTTDTSTSTAYMELRSLRSDD TAVYYCARIGDSSPSDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVMTQSPATLSVSPGERATLSCKASQSVSNDVVWYQQKPGQA PRLLIYYASNRYTGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQD YTSPWTFGQGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	564	QVQLVQSGAEVKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQG LEWMGWINTYTGEPTYADDFKGRVTMTTDTSTSTAYMELRSLRSD DTAVYYCARIGDSSPSDYWGQGTLVTVSSASTKGPSVFPLAPSSKST SGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYS LSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPP

Antibody	Region	SEQ ID NO:	Sequence
			CPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
PF-06647020	HC DEC-205 mAb with tumor mAb ScFv	565	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVQSGPEVKKPGASVKVSCKASGYTFTDYAVHWVRQAPGKRLE WIGVISTYNDYTYNNQDFKGRVTMTRDTSASTAYMELSRLRSEDTA VYYCARGNSYFYALDYWGQGTSVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASESVDSYGKSFMHWYQQKP GQAPRLLIYRASNLESGIPARFSGSGSGTDFTLTISSLEPEDFAVYYC QQSNEDPWTFGGGTKLEIK
	HC tumor mAb with DEC-205 mAb ScFv	566	QVQLVQSGPEVKKPGASVKVSCKASGYTFTDYAVHWVRQAPGKR LEWIGVISTYNDYTYNNQDFKGRVTMTRDTSASTAYMELSRLRSED TAVYYCARGNSYFYALDYWGQGTSVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Antibody to PTK7	HC DEC-205 mAb with tumor mAb ScFv	567	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSSYAFHWVRQAPGKGLE WVAVISYDGSIKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARTYYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEI VLTQSPDFQSVTPKEKVTITCRASQSIGSSLHWYQQKPDQSPKLLIK YASQSFSGVPSRFSGSGSGTDFTLTINSLEAEDAAAYYCHQSSSLPIT FGQGTRLEIK

Antibody	Region	SEQ ID NO:	Sequence
	HC tumor mAb with DEC-205 mAb ScFv	568	QVQLVESGGGVVQPGRSLRLSCAASGFTFSSYAFHWVRQAPGKGL EWVAVISYDGSIKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARTYYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGGT AALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSSV VTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCPAP ELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNWY VDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKCK VSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCLV KGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDKSR WQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQL VESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWV AVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAV YYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGG GSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPR LLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
Ladiratuzumab	HC DEC-205 mAb with tumor mAb ScFv	569	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKASGLTIEDYYMHWVRQAPGQGL EWMGWIDPENGDTEYGPKFQGRVTMTRDTSINTAYMELSRLRSDD TAVYYCAVHNAHYGTWFAYWGQGTLVTVSSGGGGSGGGGSGGG GSGGGGSDVVMTQSPLSLPVTLGQPASISCRSSQSLLHSSGNTYLEY FQQRPGQSPRPLIYKISTRFSGVPDRFSGSGSGTDFTLKISRVEAEDV GVYYCFQGSHVPYTFGGGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	570	QVQLVQSGAEVKKPGASVKVSCKASGLTIEDYYMHWVRQAPGQG LEWMGWIDPENGDTEYGPKFQGRVTMTRDTSINTAYMELSRLRSD DTAVYYCAVHNAHYGTWFAYWGQGTLVTVSSASTKGPSVFPLAPS SKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSS GLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKT HTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDP EVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLN GKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQ VSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSK LTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGG GSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGK GLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRA EDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGG GSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKP GQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYC QQRRNWPLTFGGGTKVEIK
Cirmtuzumab	HC DEC-205 mAb with tumor mAb ScFv	571	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLY LQMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGP SVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTF PAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEP KSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVV DVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVL HQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPG GGGGSGGGGSQVQLQESGPGLVKPSQTLSLTCTVSGYAFTAYNIHW

Antibody	Region	SEQ ID NO:	Sequence
			VRQAPGQGLEWMGSFDPYDGGSSYNQKFKDRLTISKDTSKNQVVL TMTNMDPVDTATYYCARGWYYFDYWGHGTLVTVSSGGGGSGGG GSGGGGSGGGGSDIVMTQTPLSLPVTPGEPASISCRASKSISKYLAW YQQKPGQAPRLLIYSGSTLQSGIPPRFSGSGYGTDFTLTINNIESEDA AYYFCQQHDESPY TFGEGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	572	QVQLQESGPGLVKPSQTLSLTCTVSGYAFTAYNIHWVRQAPGQGLE WMGSFDPYDGGSSYNQKFKDRLTISKDTSKNQVVLTMTNMDPVDT ATYYCARGWYYFDYWGHGTLVTVSSASTKGPSVFPLAPSSKSTSG GTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLS SVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCL VKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDK SRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK
Antibody to MAGE-A3	HC DEC-205 mAb with tumor mAb ScFv	573	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLY LQMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGP SVFPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTF PAVLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEP KSCDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVV DVSHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVL HQDWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSR EEMTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSD GSFFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPG GGGGSGGGGSQVQLVESGGGVVQPGRSLRLSCTASGFRFRSHGMH WVRQAPGKGLEWVAVISYDGNNKLYADSVKGRITISRDNSKNTLFL QMNNVRAEDTAVYYCASPYTSDWQYFQYWGQGTLVIVSSGGGGS GGGGSGGGGSGGGGSEIVMTQSPATLSVSPGERATFSCRASQNISTT LAWYQQKPGQAPRLLIYDTSTRATGIPARFSGSGSGTEFTLTISSLQS EDLAVYYCQQSNSWPLTFGGGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	574	QVQLVESGGGVVQPGRSLRLSCTASGFRFRSHGMHWVRQAPGKGL EWVAVISYDGNNKLYADSVKGRITISRDNSKNTLFLQMNNVRAEDT AVYYCASPYTSDWQYFQYWGQGTLVIVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Antibody to NY-ESO-1	HC DEC-205 mAb with tumor mAb ScFv	575	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF

Antibody	Region	SEQ ID NO:	Sequence
			NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVQSGGGVVRPGGSLRLSCAASGFSFIDYGMSWVRQVPGKGLE WVAGMNWSGDKKGHAESVKGRFIISRDNAKNTLYLEMSSLRVEDT ALYFCARGEYSNRFDPRGRGTLVTVSSGGGGSGGGGSGGGGSGGG GSDIVMTQTPLSLPVTLGQPASLSCRSSQSLVFTDGNTYLNWFQQRP GQSPRRLIYKVSSRDPGVPDRFSGTGSGTDFTLEISRVEAEDIGVYYC MQGTHWPPIFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	576	QVQLVQSGGGVVRPGGSLRLSCAASGFSFIDYGMSWVRQVPGKGL EWVAGMNWSGDKKGHAESVKGRFIISRDNAKNTLYLEMSSLRVED TALYFCARGEYSNRFDPRGRGTLVTVSSASTKGPSVFPLAPSSKSTS GGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSL SSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPC PAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFN WYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYK CKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTC LVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVD KSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQV QLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Trastuzumab	HC DEC-205 mAb with tumor mAb ScFv	686	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSE VQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLE WVARIYPTNGYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDT AVYYCSRWGGDGFYAMDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKP GKAPKLLIYSASFLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYC QQHYTTPPTFGQGTKVEIK
	HC tumor mAb with DEC-205 mAb ScFv	687	EVQLVESGGGLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLE WVARIYPTNGYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDT AVYYCSRWGGDGFYAMDYWGQGTLVTVSSASTKGPSVFPLAPSSK STSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGL YSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTC PPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSL TCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
	HC DEC205	797	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL

Antibody	Region	SEQ ID NO:	Sequence
	mAb with tumor mAb ScFv (LH,25mer)		EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKF NWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEY KCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLT CLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSD IQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLL IYSASFLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPP TFGQGTKVEIKGGGGSGGGGSGGGGSGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTN GYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWG GDGFYAMDYWGQGTLVTVSS

TABLE 9. Fusion Sequences – CD40 fusions via the light chain

Antibody	Region	SEQ ID NO:	Sequence
Pertuzumab	LC CD40 mAb containing tumor mAb ScFv	766	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVADVNP NSGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCAR NLGPSFYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSA SYRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFG QGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	23	DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKL LIYSASYRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIY PYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQS GAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGW INPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
Cetuximab	LC CD40 mAb containing tumor mAb ScFv	703	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLKQSGP GLVQPSQSLSITCTVSGFSLTNYGVHWVRQSPGKGLEWLGVIWSGG NTDYNTPFTSRLSINKDNSKSQVFFKMNSLQSNDTAIYYCARALTY YDYEFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGGSDILLTQS PVILSVSPGERVSFSCRASQSIGTNIHWYQQRTNGSPRLLIKYASESIS GIPSRFSGSGSGTDFTLSINSVESEDIADYYCQQNNNWPTTFGAGTK LELK
	LC tumor mAb containing CD40 mAb ScFv	36	DILLTQSPVILSVSPGERVSFSCRASQSIGTNIHWYQQRTNGSPRLLIK YASESISGIPSRFSGSGSGTDFTLSINSVESEDIADYYCQQNNNWPTT FGAGTKLELKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREA KVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKH KVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGAE

Antibody	Region	SEQ ID NO:	Sequence
			VKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINP DSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCAR DQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGK APNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ ANIFPLTFGGGTKVEIK
Panitumumab	LC CD40 mAb containing tumor mAb ScFv	760	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQESGP GLVKPSETLSLTCTVSGGSVSSGDYYWTWIRQSPGKGLEWIGHIYY SGNTNYNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAIYYCVRDRVT GAFDIWGQGTMVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPS SLSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKLLIYDASNLE TGVPSRFSGSGSGTDFTFTISSLQPEDIATYFCQHFDHLPLAFGGGTK VEIK
	LC tumor mAb containing CD40 mAb ScFv	49	DIQMTQSPSSLSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKL LIYDASNLETGVPSRFSGSGSGTDFTFTISSLQPEDIATYFCQHFDHLP LAFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
Nimotuzumab	LC CD40 mAb containing tumor mAb ScFv	751	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQSGA EVKKPGSSVKVSCKASGYTFTNYYIYWVRQAPGQGLEWIGGINPTS GGSNFNEKFKTRVTITVDESTNTAYMELSSLRSEDTAFYFCARQGL WFDSDGRGFDFWGQGSTVTVSSGGGGSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCRSSQNIVHSNGNTYLDWYQQTPGKAP KLLIYKVSNRFSGVPSRFSGSGSGTDFTFTISSLQPEDIATYYCFQYSH VPWTFGQGTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	62	DIQMTQSPSSLSASVGDRVTITCRSSQNIVHSNGNTYLDWYQQTPG KAPKLLIYKVSNRFSGVPSRFSGSGSGTDFTFTISSLQPEDIATYYCFQ YSHVPWTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLN NFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSK ADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQL VQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEW MGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTA VYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGS GGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWY QQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCQQANIFPLTFGGGTKVEIK
Zalutumumab	LC CD40 mAb containing tumor mAb ScFv	802	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSTYGMHWVRQAPGKGLEWVAVIWD DGSYKYYGDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DGITMVRGVMKDYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSAIQLTQSPSSLSASVGDRVTITCRASQDISSALVWYQQKPGKAP

Antibody	Region	SEQ ID NO:	Sequence
			KLLIYDASSLESGVPSRFSGSESGTDFTLTISSLQPEDFATYYCQQFNS YPLTFGGGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	75	AIQLTQSPSSLSASVGDRVTITCRASQDISSALVWYQQKPGKAPKLLI YDASSLESGVPSRFSGSESGTDFTLTISSLQPEDFATYYCQQFNSYPL TFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWIN PDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCA RDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPG KAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQ QANIFPLTFGGGTKVEIK
Onartuzumab	LC CD40 mAb containing tumor mAb ScFv	757	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGYTFTSYWLHWVRQAPGKGLEWVGMIDPS NSDTRFNPNFKDRFTISADTSKNTAYLQMNSLRAEDTAVYYCATYR SYVTPLDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQ SPSSLSASVGDRVTITCKSSQSLLYTSSQKNYLAWYQQKPGKAPKLL IYWASTRESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYAY PWTFGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	88	DIQMTQSPSSLSASVGDRVTITCKSSQSLLYTSSQKNYLAWYQQKP GKAPKLLIYWASTRESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQYYAYPWTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVC LLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLT LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGL EWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDD TAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGG GSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLA WYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPED FATYYCQQANIFPLTFGGGTKVEIK
Patritumab	LC CD40 mAb containing tumor mAb ScFv	763	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQWG AGLLKPSETLSLTCAVYGGSFSGYYWSWIRQPPGKGLEWIGEINHS GSTNYNPSLKSRVTISVETSKNQFSLKLSSVTAADTAVYYCARDKW TWYFDLWGRGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIEMTQSP DSLAVSLGERATINCRSSQSVLYSSSNRNYLAWYQQNPGQPPKLLIY WASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQQYYSTP RTFGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	101	DIEMTQSPDSLAVSLGERATINCRSSQSVLYSSSNRNYLAWYQQNP GQPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYY CQQYYSTPRTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVC LLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLT LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGL EWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDD TAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGG GSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLA WYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPED FATYYCQQANIFPLTFGGGTKVEIK
Clivatuzumab	LC CD40 mAb	709	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP

Antibody	Region	SEQ ID NO:	Sequence
	containing tumor mAb ScFv		LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQSGA EVKKPGASVKVSCEASGYTFPSYVLHWVKQAPGQGLEWIGYINPY NDGTQYNEKFKGKATLTRDTSINTAYMELSRLRSDDTAVYYCARG FGGSYGFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQLT QSPSSLSASVGDRVTMTCSASSSVSSSYLYWYQQKPGKAPKLWIYS TSNLASGVPARFSGSGSGTDFTLTISSLQPEDSASYFCHQWNRYPYT FGGGTRLEIK
	LC tumor mAb containing CD40 mAb ScFv	114	DIQLTQSPSSLSASVGDRVTMTCSASSSVSSSYLYWYQQKPGKAPK LWIYSTSNLASGVPARFSGSGSGTDFTLTISSLQPEDSASYFCHQWN RYPYTFGGGTRLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNF YPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQ SGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMG WINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVY YCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGG GGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQ KPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATY YCQQANIFPLTFGGGTKVEIK
Sofituzumab	LC CD40 mAb containing tumor mAb ScFv	790	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGYSITNDYAWNWVRQAPGKGLEWVGYISY SGYTTYNPSLKSRFTISRDTSKNTLYLQMNSLRAEDTAVYYCARWT SGLDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPS SLSASVGDRVTITCKASDLIHNWLAWYQQKPGKAPKLLIYGATSLE TGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYWTTPFTFGQGT KVEIK
	LC tumor mAb containing CD40 mAb ScFv	127	DIQMTQSPSSLSASVGDRVTITCKASDLIHNWLAWYQQKPGKAPKL LIYGATSLETGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYWTT PFTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
Edrecolomab	LC CD40 mAb containing tumor mAb ScFv	718	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQSGA ELVRPGTSVKVSCKASGYAFTNYLIEWVKQRPGQGLEWIGVINPGS GGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSAVYFCARDG PWFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGGSNIVMTQSP KSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLIYGASN RYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSYPYTFG GGTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	140	NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPK LLIYGASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQG YSYPYTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNF YPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQ SGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMG

Antibody	Region	SEQ ID NO:	Sequence
			WINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVY YCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGG GGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQ KPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATY YCQQANIFPLTFGGGTKVEIK
Adecatumumab	LC CD40 mAb containing tumor mAb ScFv	694	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLLESGG GVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAVISYD GSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAKD MGWGSGWRPYYYYGMDVWGQGTTVTVSSGGGGSGGGGSGGGGS GGGGSELQMTQSPSSLSASVGDRVTITCRTSQSISSYLNWYQQKPGQ PPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQPEDSATYYCQQ SYDIPYTFGQGTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	153	ELQMTQSPSSLSASVGDRVTITCRTSQSISSYLNWYQQKPGQPPKLLI YWASTRESGVPDRFSGSGSGTDFTLTISSLQPEDSATYYCQQSYDIP YTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWIN PDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCA RDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPG KAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQ QANIFPLTFGGGTKVEIK
Anetumab	LC CD40 mAb containing tumor mAb ScFv	700	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVELVQSGA EVKKPGESLKISCKGSGYSFTSYWIGWVRQAPGKGLEWMGIIDPGD SRTRYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCARGQL YGGTYMDGWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIALT QPASVSGSPGQSITISCTGTSSDIGGYNSVSWYQQHPGKAPKLMIYG VNNRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYCSSYDIESAT PVFGGGTKLTVL
	LC tumor mAb containing CD40 mAb ScFv	166	DIALTQPASVSGSPGQSITISCTGTSSDIGGYNSVSWYQQHPGKAPKL MIYGVNNRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYCSSYDI ESATPVFGGGTKLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLIS DFYPGAVTVAWKGDSSPVKAGVETTTPSKQSNNKYAASSYLSLTPE QWKSHRSYSCQVTHEGSTVEKTVAPTECSGGGGSGGGGSQVQLVQ SGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMG WINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVY YCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGG GGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQ KPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATY YCQQANIFPLTFGGGTKVEIK
huDS6	LC CD40 mAb containing tumor mAb ScFv	724	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQAQLVQSGA EVVKPGASVKMSCKASGYTFTSYNMHWVKQTPGQGLEWIGYIYPG NGATNYNQKFQGKATLTADPSSSTAYMQISSLTSEDSAVYFCARGD SVPFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGGSEIVLTQSP ATMSASPGERVTITCSAHSSVSFMHWFQQKPGTSPKLWIYSTSSLAS GVPARFGGSGSGTSYSLTISSMEAEDAATYYCQQRSSFPLTFGAGTK

Antibody	Region	SEQ ID NO:	Sequence
			LELK
	LC tumor mAb containing CD40 mAb ScFv	179	EIVLTQSPATMSASPGERVTITCSAHSSVSFMHWFQQKPGTSPKLWI YSTSSLASGVPARFGGSGSGTSYSLTISSMEAEDAATYYCQQRSSFP LTFGAGTKLELKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
Lifastuzumab	LC CD40 mAb containing tumor mAb ScFv	736	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFSFSDFAMSWVRQAPGKGLEWVATIGRV AFHTYYPDSMKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARH RGFDVGHFDFWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCRSSETLVHSSGNTYLEWYQQKPGKAP KLLIYRVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCFQGS FNPLTFGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	192	DIQMTQSPSSLSASVGDRVTITCRSSETLVHSSGNTYLEWYQQKPGK APKLLIYRVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCFQ GSFNPLTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV QSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWM GWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSG GGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQ QKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQANIFPLTFGGGTKVEIK
Sacituzumab	LC CD40 mAb containing tumor mAb ScFv	781	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQSGS ELKKPGASVKVSCKASGYTFTNYGMNWVKQAPGQGLKWMGWIN TYTGEPTYTDDFKGRFAFSLDTSVSTAYLQISSLKADDTAVYFCARG GFGSSYWYFDVWGQGSLVTVSSGGGGSGGGGSGGGGSGGGGSDIQ LTQSPSSLSASVGDRVSITCKASQDVSIAVAWYQQKPGKAPKLLIYS ASYRYTGVPDRFSGSGSGTDFTLTISSLQPEDFAVYYCQQHYITPLTF GAGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	205	DIQLTQSPSSLSASVGDRVSITCKASQDVSIAVAWYQQKPGKAPKLL IYSASYRYTGVPDRFSGSGSGTDFTLTISSLQPEDFAVYYCQQHYITP LTFGAGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWIN PDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCA RDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPG KAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQ QANIFPLTFGGGTKVEIK
PR1A3	LC CD40 mAb containing	772	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE

Antibody	Region	SEQ ID NO:	Sequence
	tumor mAb ScFv		AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVKLQQSGP ELKKPGETVKISCKASGYTFTEFGMNWVKQAPGKGLKWMGWINT KTGEATYVEEFKGRFAFSLETSATTAYLQINNLKNEDTAKYFCARW DFYDYVEAMDYWGQGTTVTVSSGGGGSGGGGSGGGGSGGGGSDI VMTQSQRFMSTSVGDRVSVTCKASQNVGTNVAWYQQKPGQSPKA LIYSASYRYSGVPDRFTGSGSGTDFTLTISNVQSEDLAEYFCHQYYT YPLFTFGSGTKLEMK
	LC tumor mAb containing CD40 mAb ScFv	218	DIVMTQSQRFMSTSVGDRVSVTCKASQNVGTNVAWYQQKPGQSP KALIYSASYRYSGVPDRFTGSGSGTDFTLTISNVQSEDLAEYFCHQY YTYPLFTFGSGTKLEMKRTVAAPSVFIFPPSDEQLKSGTASVVCLLN NFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSK ADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQL VQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEW MGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTA VYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGS GGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWY QQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCQQANIFPLTFGGGTKVEIK
Humanized PR1A3	LC CD40 mAb containing tumor mAb ScFv	820	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFTEFGMNWVRQAPGQGLEWMGWINT KTGEATYVEEFKGRVTFTTDTSTSTAYMELRSLRSDDTAVYYCAR WDFAYYVEAMDYWGQGTTVTVSSGGGGSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKASAAVGTYVAWYQQKPGKAPK LLIYSASYRKRGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCHQYYT YPLFTFGQGTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	817	DIQMTQSPSSLSASVGDRVTITCKASAAVGTYVAWYQQKPGKAPK LLIYSASYRKRGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCHQYYT YPLFTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFY PREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQS GAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGW INPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
	LC tumor mAb containing CD40 mab scFv (LH)	844	DIQMTQSPSSLSASVGDRVTITCKASAAVGTYVAWYQQKPGKAPK LLIYSASYRKRGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCHQYYT YPLFTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFY PREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSDIQMTQS PSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTL QSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGT KVEIKGGGGSGGGGSGGGGSGGGGSQVQLVQSGAEVKKPGASVK VSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQ KFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTN GVCSYFDYWGQGTLVTVSS
Humanized Ab2-3	LC CD40 mAb containing tumor mAb ScFv	838	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLQESGP GLVKPGGSLSLSCAASGFVFSSYDMSWVRQTPERGLEWVAYISSGG GITYAPSTVKGRFTVSRDNAKNTLYLQMNSLTSEDTAVYYCAAHY

Antibody	Region	SEQ ID NO:	Sequence
			FGSSGPFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMT QSPASLSASVGDRVTITCRASENIFSYLAWYQQKPGKSPKLLVYNTR TLAEGVPSRFSGSGSGTDFSLTISSLQPEDFATYYCQHHYGTPFTFGS GTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	835	DIQMTQSPASLSASVGDRVTITCRASENIFSYLAWYQQKPGKSPKLL VYNTRTLAEGVPSRFSGSGSGTDFSLTISSLQPEDFATYYCQHHYGT PFTFGSGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
	LC tumor mAb containing CD40 mab scFv (LH)	842	DIQMTQSPASLSASVGDRVTITCRASENIFSYLAWYQQKPGKSPKLL VYNTRTLAEGVPSRFSGSGSGTDFSLTISSLQPEDFATYYCQHHYGT PFTFGSGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSDIQMTQSPS SVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNLLIYTASTLQ SGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFPLTFGGGTK VEIKGGGGSGGGGSGGGGSGGGGSQVQLVQSGAEVKKPGASVKVS CKASGYTFTGYYMHWVRQAPGQGLEWMGWINPDSGGTNYAQKF QGRVTMTRDTSISTAYMELNRLRSDDTAVYYCARDQPLGYCTNGV CSYFDYWGQGTLVTVSS
IMAB362, CLAUDIXIMAB	LC CD40 mAb containing tumor mAb ScFv	727	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQPGA ELVRPGASVKLSCKASGYTFTSYWINWVKQRPGQGLEWIGNIYPSD SYTNYNQKFKDKATLTVDKSSSTAYMQLSSPTSEDSAVYYCTRSW RGNSFDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQS PSSLTVTAGEKVTMSCKSSQSLLNSGNQKNYLTWYQQKPGQPPKLL IYWASTRESGVPDRFTGSGSGTDFTLTISSVQAEDLAVYYCQNDYS YPFTFGSGTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	231	DIVMTQSPSSLTVTAGEKVTMSCKSSQSLLNSGNQKNYLTWYQQK PGQPPKLLIYWASTRESGVPDRFTGSGSGTDFTLTISSVQAEDLAVY YCQNDYSYPFTFGSGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVC LLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLT LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGL EWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDD TAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGG GSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLA WYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPED FATYYCQQANIFPLTFGGGTKVEIK
AMG595	LC CD40 mAb containing tumor mAb ScFv	697	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQSGRSLRLSCAASGFTFRNYGMHWVRQAPGKGLEWVAVIWY DGSDKYYADSVRGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DGYDILTGNPRDFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGG GSDTVMTQTPLSSHVTLGQPASISCRSSQSLVHSDGNTYLSWLQQRP GQPPRLLIYRISRRFSGVPDRFSGSGAGTDFTLEISRVEAEDVGVYYC MQSTHVPRTFGQGTKVEIK

Antibody	Region	SEQ ID NO:	Sequence
	LC tumor mAb containing CD40 mAb ScFv	270	DTVMTQTPLSSHVTLGQPASISCRSSQSLVHSDGNTYLSWLQQRPG QPPRLLIYRISRRFSGVPDRFSGSGAGTDFTLEISRVEAEDVGVYYC MQSTHVPRTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCL LNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL SKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQV QLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDT AVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGG SGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAW YQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDF ATYYCQQANIFPLTFGGGTKVEIK
ABT806	LC CD40 mAb containing tumor mAb ScFv	691	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLQESGP GLVKPSQTLSLTCTVSGYSISRDFAWNWIRQPPGKGLEWMGYISYN GNTRYQPSLKSRITISRDTSKNQFFLKLNSVTAADTATYYCVTASRG FPYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSM SVSVGDRVTITCHSSQDINSNIGWLQQKPGKSFKGLIYHGTNLDDGV PSRFSGSGSGTDYTLTISSLQPEDFATYYCVQYAQFPWTFGGGTKLE IK
	LC tumor mAb containing CD40 mAb ScFv	283	DIQMTQSPSSMSVSVGDRVTITCHSSQDINSNIGWLQQKPGKSFKGL IYHGTNLDDGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCVQYAQF PWTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQS GAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGW INPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
Sibrotuzumab	LC CD40 mAb containing tumor mAb ScFv	787	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKTSRYTFTEYTIHWVRQAPGQRLEWIGGINPNN GIPNYNQKFKGRVTITVDTSASTAYMELSSLRSEDTAVYYCARRRIA YGYDEGHAMDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDI VMTQSPDSLAVSLGERATINCKSSQSLLYSRNQKNYLAWYQQKPG QPPKLLIFWASTRESGVPDRFSGSGFGTDFTLTISSLQAEDVAVYYC QQYFSYPLTFGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	296	DIVMTQSPDSLAVSLGERATINCKSSQSLLYSRNQKNYLAWYQQKP GQPPKLLIFWASTRESGVPDRFSGSGFGTDFTLTISSLQAEDVAVYY CQQYFSYPLTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVC LLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLT LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQ VQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGL EWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDD TAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGG GSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLA WYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPED FATYYCQQANIFPLTFGGGTKVEIK
DS-8895a variant 1	LC CD40 mAb containing tumor mAb	712	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK

Antibody	Region	SEQ ID NO:	Sequence
	ScFv		HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLEWMGWINT YTGEPTYSDDFKGRVTITADTSTSTAYLELSSLRSEDTAVYYCATYY RYERDFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIVMT QSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLIY KVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVP YTFGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	309	DIVMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSP QLLIYKVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQG SHVPYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV QSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWM GWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSG GGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQ QKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQANIFPLTFGGGTKVEIK
DS-8895a variant 2	LC CD40 mAb containing tumor mAb ScFv	715	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQIQLVQSGA EVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLKWMGWINT YTGEPTYSDDFKGRFAFSLDTSTSTAYLELSSLRSEDTAVYYCATYY RYERDFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDVLMTQ SPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLIYK VSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYT FGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	322	DVLMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQS PQLLIYKVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQ GSHVPYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLN NFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSK ADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQL VQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEW MGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTA VYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGS GGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWY QQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCQQANIFPLTFGGGTKVEIK
MEDI-547	LC CD40 mAb containing tumor mAb ScFv	742	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLLESGG GLVQPGGSLRLSCAASGFTFSHYMMAWVRQAPGKGLEWVSRIGPS GGPTHYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAGY DSGYDYVAVAGPAEYFQHWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSDIQMTQSPSSLSASVGDRVTITCRASQSISTWLAWYQQKPG KAPKLLIYKASNLHTGVPSRFSGSGSGTEFSLTISGLQPDDFATYYCQ QYNSYSRTFGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	335	DIQMTQSPSSLSASVGDRVTITCRASQSISTWLAWYQQKPGKAPKLL IYKASNLHTGVPSRFSGSGSGTEFSLTISGLQPDDFATYYCQQYNSY SRTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG

Antibody	Region	SEQ ID NO:	Sequence
			SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
Narnatumab	LC CD40 mAb containing tumor mAb ScFv	748	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFTFSSYLMTWVRQAPGKGLEWVANIKQD GSEKYYVDSVKGRFTISRDNAKNSLNLQMNSLRAEDTAVYYCTRD GYSSGRHYGMDVWGQGTTVIVSSGGGGSGGGGSGGGGSGGGGSEI VLTQSPATLSLSPGERATLSCRASQSVSRYLAWYQQKPGQAPRLLIY DASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSNWPR TFGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	348	EIVLTQSPATLSLSPGERATLSCRASQSVSRYLAWYQQKPGQAPRLL IYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSNWP RTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
RG7841	LC CD40 mAb containing tumor mAb ScFv	775	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGP ALVKPTQTLTLTCTVSGFSLTGYSVNWIRQPPGKALEWLGMIWGD GSTDYNSALKSRLTISKDTSKNQVVLTMTNMDPVDTATYYCARDY YFNYASWFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCSASQGISNYLNWYQQKPGKTVKLLIYY TSNLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQYSELPWT FGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	361	DIQMTQSPSSLSASVGDRVTITCSASQGISNYLNWYQQKPGKTVKLL IYYTSNLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQYSELP WTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
Farletuzumab	LC CD40 mAb containing tumor mAb ScFv	721	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GVVQPGRSLRLSCSASGFTFSGYGLSWVRQAPGKGLEWVAMISSG GSYTYYADSVKGRFAISRDNAKNTLFLQMDSLRPEDTGVYFCARH GDDPAWFAYWGQGTPVTVSSGGGGSGGGGSGGGGSGGGGSDIQL TQSPSSLSASVGDRVTITCSVSSSISSNNLHWYQQKPGKAPKPWIYG TSNLASGVPSRFSGSGSGTDYTFTISSLQPEDIATYYCQQWSSYPYM YTFGQGTKVEIK
	LC tumor	374	DIQLTQSPSSLSASVGDRVTITCSVSSSISSNNLHWYQQKPGKAPKP

Antibody	Region	SEQ ID NO:	Sequence
	mAb containing CD40 mAb ScFv		WIYGTSNLASGVPSRFSGSGSGTDYTFTISSLQPEDIATYYCQQWSS YPYMYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV QSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWM GWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSG GGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQ QKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQANIFPLTFGGGTKVEIK
Mirvetuximab	LC CD40 mAb containing tumor mAb ScFv	745	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSLEWIGRIHPYD GDTFYNQKFQGKATLTVDKSSNTAHMELLSLTSEDFAVYYCTRYD GSRAMDYWGQGTTVTVSSGGGGSGGGGSGGGGSGGGGSDIVLTQ SPLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPGQQPRLLIY RASNLEAGVPDRFSGSGSKTDFTLTISPVEAEDAATYYCQQSREYPY TFGGGTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	387	DIVLTQSPLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPGQQ PRLLIYRASNLEAGVPDRFSGSGSKTDFTLTISPVEAEDAATYYCQQ SREYPYTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV QSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWM GWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSG GGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQ QKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQANIFPLTFGGGTKVEIK
J591 variant1	LC CD40 mAb containing tumor mAb ScFv	730	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLQQSGP ELKKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNINPNNG GTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWN FDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQSHKF MSTSVGDRVSIICKASQDVGTAVDWYQQKPGQSPKLLIYWASTRHT GVPDRFTGSGSGTDFTLTITNVQSEDLADYFCQQYNSYPLTFGAGT MLDLK
	LC tumor mAb containing CD40 mAb ScFv	400	DIVMTQSHKFMSTSVGDRVSIICKASQDVGTAVDWYQQKPGQSPK LLIYWASTRHTGVPDRFTGSGSGTDFTLTITNVQSEDLADYFCQQY NSYPLTFGAGTMLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV QSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWM GWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSG GGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQ QKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQANIFPLTFGGGTKVEIK
J591 variant 2	LC CD40 mAb containing tumor mAb ScFv	733	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLQQSGP

Antibody	Region	SEQ ID NO:	Sequence
			ELVKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNINPNNG GTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWN FDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGGGSNIVMTQSPKSM SMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLIYGASNRYT GVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSYPYTFGGGT KLEIK
	LC tumor mAb containing CD40 mAb ScFv	413	NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPK LLIYGASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQG YSYPYTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNF YPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKAD YEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQ SGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMG WINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVY YCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGG GGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQ KPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATY YCQQANIFPLTFGGGTKVEIK
Rovalpituzumab	LC CD40 mAb containing tumor mAb ScFv	778	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQGLEWMGWIN TYTGEPTYADDFKGRVTMTTDTSTSTAYMELRSLRSDDTAVYYCA RIGDSSPSDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVM TQSPATLSVSPGERATLSCKASQSVSNDVVWYQQKPGQAPRLLIYY ASNRYTGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQDYTSPWTF GQGTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	426	EIVMTQSPATLSVSPGERATLSCKASQSVSNDVVWYQQKPGQAPRL LIYYASNRYTGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQDYTS PWTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQS GAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGW INPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
PF-06647020	LC CD40 mAb containing tumor mAb ScFv	769	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGP EVKKPGASVKVSCKASGYTFTDYAVHWVRQAPGKRLEWIGVISTY NDYTYNNQDFKGRVTMTRDTSASTAYMELSRLRSEDTAVYYCAR GNSYFYALDYWGQGTSVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASESVDSYGKSFMHWYQQKPGQAPRL LIYRASNLESGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQSNEDP WTFGGGTKLEIK
	LC tumor mAb containing CD40 mAb ScFv	439	EIVLTQSPATLSLSPGERATLSCRASESVDSYGKSFMHWYQQKPGQ APRLLIYRASNLESGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQS NEDPWTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV QSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWM GWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAV YYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSG GGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQ

Antibody	Region	SEQ ID NO:	Sequence
			QKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFAT YYCQQANIFPLTFGGGTKVEIK
Antibody to PTK7	LC CD40 mAb containing tumor mAb ScFv	688	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSSYAFHWVRQAPGKGLEWVAVISYD GSIKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARTY YFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPDF QSVTPKEKVTITCRASQSIGSSLHWYQQKPDQSPKLLIKYASQSFSG VPSRFSGSGSGTDFTLTINSLEAEDAAAYYCHQSSSLPITFGQGTRLE IK
	LC tumor mAb containing CD40 mAb ScFv	452	EIVLTQSPDFQSVTPKEKVTITCRASQSIGSSLHWYQQKPDQSPKLLI KYASQSFSGVPSRFSGSGSGTDFTLTINSLEAEDAAAYYCHQSSSLPI TFGQGTRLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREA KVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKH KVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGAE VKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINP DSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCAR DQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGK APNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ ANIFPLTFGGGTKVEIK
Ladiratuzumab	LC CD40 mAb containing tumor mAb ScFv	784	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGLTIEDYYMHWVRQAPGQGLEWMGWIDP ENGDTEYGPKFQGRVTMTRDTSINTAYMELSRLRSDDTAVYYCAV HNAHYGTWFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSD VVMTQSPLSLPVTLGQPASISCRSSQSLLHSSGNTYLEYFQQRPGQSP RPLIYKISTRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGS HVPYTFGGGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	465	DVVMTQSPLSLPVTLGQPASISCRSSQSLLHSSGNTYLEYFQQRPGQ SPRPLIYKISTRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQ GSHVPYTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLN NFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSK ADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQL VQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEW MGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTA VYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGS GGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWY QQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFA TYYCQQANIFPLTFGGGTKVEIK
Cirmtuzumab	LC CD40 mAb containing tumor mAb ScFv	706	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQESGP GLVKPSQTLSLTCTVSGYAFTAYNIHWVRQAPGQGLEWMGSFDPY DGGSSYNQKFKDRLTISKDTSKNQVVLTMTNMDPVDTATYYCARG WYYFDYWGHGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQT PLSLPVTPGEPASISCRASKSISKYLAWYQQKPGQAPRLLIYSGSTLQ SGIPPRFSGSGYGTDFTLTINNIESEDAAYYFCQQHDESPY
	LC tumor mAb containing	478	DIVMTQTPLSLPVTPGEPASISCRASKSISKYLAWYQQKPGQAPRLLI YSGSTLQSGIPPRFSGSGYGTDFTLTINNIESEDAAYYFCQQHDESPY TFGEGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREA

Antibody	Region	SEQ ID NO:	Sequence
	CD40 mAb ScFv		KVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKH KVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGAE VKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWINP DSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCAR DQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGK APNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQ ANIFPLTFGGGTKVEIK
Antibody to MAGE-A3	LC CD40 mAb containing tumor mAb ScFv	739	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCTASGFRFRSHGMHWVRQAPGKGLEWVAVISYD GNNKLYADSVKGRITISRDNSKNTLFLQMNNVRAEDTAVYYCASP YTSDWQYFQYWGQGTLVIVSSGGGGSGGGGSGGGGSGGGGSEIV MTQSPATLSVSPGERATFSCRASQNISTTLAWYQQKPGQAPRLLIYD TSTRATGIPARFSGSGSGTEFTLTISSLQSEDLAVYYCQQSNSWPLTF GGGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	491	EIVMTQSPATLSVSPGERATFSCRASQNISTTLAWYQQKPGQAPRLL IYDTSTRATGIPARFSGSGSGTEFTLTISSLQSEDLAVYYCQQSNSWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWIN PDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYCA RDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPG KAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQ QANIFPLTFGGGTKVEIK
Antibody to NY-ESO-1	LC CD40 mAb containing tumor mAb ScFv	754	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGG GVVRPGGSLRLSCAASGFSFIDYGMSWVRQVPGKGLEWVAGMNW SGDKKGHAESVKGRFIISRDNAKNTLYLEMSSLRVEDTALYFCARG EYSNRFDPRGRGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQ TPLSLPVTLGQPASLSCRSSQSLVFTDGNTYLNWFQQRPGQSPRRLI YKVSSRDPGVPDRFSGTGSGTDFTLEISRVEAEDIGVYYCMQGTHW PPIFGQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	504	DIVMTQTPLSLPVTLGQPASLSCRSSQSLVFTDGNTYLNWFQQRPG QSPRRLIYKVSSRDPGVPDRFSGTGSGTDFTLEISRVEAEDIGVYYC MQGTHWPPIFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCL LNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL SKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQV QLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDT AVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGG SGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAW YQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDF ATYYCQQANIFPLTFGGGTKVEIK
Trastuzumab	LC CD40 mAb containing tumor mAb ScFv	793	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTN GYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWG

Antibody	Region	SEQ ID NO:	Sequence
			GDGFYAMDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYS ASFLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTF GQGTKVEIK
	LC tumor mAb containing CD40 mAb ScFv	685	DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKL LIYSASFLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTT PPTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
	LC CD40 mAb containing tumor mAb scFv (LH,25mer)	798	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYS GVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTK VEIKGGGGSGGGGSGGGGSGGGGSGGGGSEVQLVESGGGLVQPGG SLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTRYAD SVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAM DYWGQGTLVTVSS

TABLE 10. Fusion Sequences – DEC-205 fusions via the light chain

Antibody	Region	SEQ ID NO:	Sequence
Pertuzumab	LC DEC-205 mAb containing tumor mAb ScFv	767	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFTFTDYTMDWVRQAPGKGLEWVADVNP NSGGSIYNQRFKGRFTLSVDRSKNTLYLQMNSLRAEDTAVYYCAR NLGPSFYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKLLIYSA SYRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIYPYTFG QGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	768	DIQMTQSPSSLSASVGDRVTITCKASQDVSIGVAWYQQKPGKAPKL LIYSASYRYTGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYIY PYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
Cetuximab	LC DEC-205 mAb containing tumor mAb ScFv	704	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLKQSGP

Antibody	Region	SEQ ID NO:	Sequence
			GLVQPSQSLSITCTVSGFSLTNYGVHWVRQSPGKGLEWLGVIWSGG NTDYNTPFTSRLSINKDNSKSQVFFKMNSLQSNDTAIYYCARALTY YDYEFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGGSDILLTQS PVILSVSPGERVSFSCRASQSIGTNIHWYQQRTNGSPRLLIKYASESIS GIPSRFSGSGSGTDFTLSINSVESEDIADYYCQQNNNWPTTFGAGTK LELK
	LC tumor mAb containing DEC-205 mAb ScFv	705	DILLTQSPVILSVSPGERVSFSCRASQSIGTNIHWYQQRTNGSPRLLIK YASESISGIPSRFSGSGSGTDFTLSINSVESEDIADYYCQQNNNWPTTF GAGTKLELKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAK VQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHK VYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGGGV VQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWYDG SNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDL WGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQ SPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASN RATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGG GTKVEIK
Panitumumab	LC DEC-205 mAb containing tumor mAb ScFv	761	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQESGP GLVKPSETLSLTCTVSGGSVSSGDYYWTWIRQSPGKGLEWIGHIYYS GNTNYNPSLKSRLTISIDTSKTQFSLKLSSVTAADTAIYYCVRDRVTG AFDIWGQGTMVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKLLIYDASNLET GVPSRFSGSGSGTDFTFTISSLQPEDIATYFCQHFDHLPLAFGGGTKV EIK
	LC tumor mAb containing DEC-205 mAb ScFv	762	DIQMTQSPSSLSASVGDRVTITCQASQDISNYLNWYQQKPGKAPKL LIYDASNLETGVPSRFSGSGSGTDFTFTISSLQPEDIATYFCQHFDHLP LAFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
Nimotuzumab	LC DEC-205 mAb containing tumor mAb ScFv	752	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQSGA EVKKPGSSVKVSCKASGYTFTNYYIYWVRQAPGQGLEWIGGINPTS GGSNFNEKFKTRVTITVDESTNTAYMELSSLRSEDTAFYFCARQGL WFDSDGRGFDFWGQGSTVTVSSGGGGSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCRSSQNIVHSNGNTYLDWYQQTPGKAP KLLIYKVSNRFSGVPSRFSGSGSGTDFTFTISSLQPEDIATYYCFQYSH VPWTFGQGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	753	DIQMTQSPSSLSASVGDRVTITCRSSQNIVHSNGNTYLDWYQQTPGK APKLLIYKVSNRFSGVPSRFSGSGSGTDFTFTISSLQPEDIATYYCFQY SHVPWTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV ESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVY YCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGG SEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRL

Antibody	Region	SEQ ID NO:	Sequence
			LIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
Zalutumumab	LC DEC-205 mAb containing tumor mAb ScFv	803	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSTYGMHWVRQAPGKGLEWVAVIWD DGSYKYYGDSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DGITMVRGVMKDYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSAIQLTQSPSSLSASVGDRVTITCRASQDISSALVWYQQKPGKAP KLLIYDASSLESGVPSRFSGSESGTDFTLTISSLQPEDFATYYCQQFNS YPLTFGGGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	804	AIQLTQSPSSLSASVGDRVTITCRASQDISSALVWYQQKPGKAPKLLI YDASSLESGVPSRFSGSESGTDFTLTISSLQPEDFATYYCQQFNSYPL TFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWY DGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDA SNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFG GGTKVEIK
Onartuzumab	LC DEC-205 mAb containing tumor mAb ScFv	758	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGYTFTSYWLHWVRQAPGKGLEWVGMIDPS NSDTRFNPNFKDRFTISADTSKNTAYLQMNSLRAEDTAVYYCATYR SYVTPLDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQ SPSSLSASVGDRVTITCKSSQSLLYTSSQKNYLAWYQQKPGKAPKLL IYWASTRESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYYAY PWTFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	759	DIQMTQSPSSLSASVGDRVTITCKSSQSLLYTSSQKNYLAWYQQKPG KAPKLLIYWASTRESGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQ QYYAYPWTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLS KADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK
Patritumab	LC DEC-205 mAb containing tumor mAb ScFv	764	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQWG AGLLKPSETLSLTCAVYGGSFSGYYWSWIRQPPGKGLEWIGEINHSG STNYNPSLKSRVTISVETSKNQFSLKLSSVTAADTAVYYCARDKWT WYFDLWGRGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIEMTQSPD SLAVSLGERATINCRSSQSVLYSSSNRNYLAWYQQNPGQPPKLLIY WASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYYCQQYYSTPR TFGQGTKVEIK
	LC tumor mAb	765	DIEMTQSPDSLAVSLGERATINCRSSQSVLYSSSNRNYLAWYQQNP GQPPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQAEDVAVYY

Antibody	Region	SEQ ID NO:	Sequence
	containing DEC-205 mAb ScFv		CQQYYSTPRTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVC LLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLT LSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQ VQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
Clivatuzumab	LC DEC-205 mAb containing tumor mAb ScFv	710	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQSGA EVKKPGASVKVSCEASGYTFPSYVLHWVKQAPGQGLEWIGYINPY NDGTQYNEKFKGKATLTRDTSINTAYMELSRLRSDDTAVYYCARG FGGSYGFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQLT QSPSSLSASVGDRVTMTCSASSSVSSSYLYWYQQKPGKAPKLWIYS TSNLASGVPARFSGSGSGTDFTLTISSLQPEDSASYFCHQWNRYPYT FGGGTRLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	711	DIQLTQSPSSLSASVGDRVTMTCSASSSVSSSYLYWYQQKPGKAPKL WIYSTSNLASGVPARFSGSGSGTDFTLTISSLQPEDSASYFCHQWNR YPYTFGGGTRLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
Sofituzumab	LC DEC-205 mAb containing tumor mAb ScFv	791	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGYSITNDYAWNWVRQAPGKGLEWVGYISY SGYTTYNPSLKSRFTISRDTSKNTLYLQMNSLRAEDTAVYYCARWT SGLDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPS SLSASVGDRVTITCKASDLIHNWLAWYQQKPGKAPKLLIYGATSLE TGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYWTTPFTFGQGT KVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	792	DIQMTQSPSSLSASVGDRVTITCKASDLIHNWLAWYQQKPGKAPKL LIYGATSLETGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQYWTT PFTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
Edrecolomab	LC DEC-205 mAb containing tumor mAb ScFv	719	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQSGA ELVRPGTSVKVSCKASGYAFTNYLIEWVKQRPGQGLEWIGVINPGS

Antibody	Region	SEQ ID NO:	Sequence
			GGTNYNEKFKGKATLTADKSSSTAYMQLSSLTSDDSAVYFCARDG PWFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGGSNIVMTQSP KSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLIYGASN RYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSYPYTFG GGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	720	NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPK LLIYGASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGY SYPYTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFY PREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVES GGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVI WYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEI VLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIY DASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPL TFGGGTKVEIK
Adecatumumab	LC DEC-205 mAb containing tumor mAb ScFv	695	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLLESGG GVVQPGRSLRLSCAASGFTFSSYGMHWVRQAPGKGLEWVAVISYD GSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAKD MGWGSGWRPYYYYGMDVWGQGTTVTVSSGGGGSGGGGSGGGGS GGGGSELQMTQSPSSLSASVGDRVTITCRTSQSISSYLNWYQQKPGQ PPKLLIYWASTRESGVPDRFSGSGSGTDFTLTISSLQPEDSATYYCQQ SYDIPYTFGQGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	696	ELQMTQSPSSLSASVGDRVTITCRTSQSISSYLNWYQQKPGQPPKLLI YWASTRESGVPDRFSGSGSGTDFTLTISSLQPEDSATYYCQQSYDIP YTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWY DGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDA SNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFG GGTKVEIK
Anetumab	LC DEC-205 mAb containing tumor mAb ScFv	701	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVELVQSGA EVKKPGESLKISCKGSGYSFTSYWIGWVRQAPGKGLEWMGIIDPGD SRTRYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCARGQL YGGTYMDGWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIALT QPASVSGSPGQSITISCTGTSSDIGGYNSVSWYQQHPGKAPKLMIYG VNNRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYCSSYDIESAT PVFGGGTKLTVL
	LC tumor mAb containing DEC-205 mAb ScFv	702	DIALTQPASVSGSPGQSITISCTGTSSDIGGYNSVSWYQQHPGKAPKL MIYGVNNRPSGVSNRFSGSKSGNTASLTISGLQAEDEADYYCSSYDI ESATPVFGGGTKLTVLGQPKAAPSVTLFPPSSEELQANKATLVCLIS DFYPGAVTVAWKGDSSPVKAGVETTTPSKQSNNKYAASSYLSLTPE QWKSHRSYSCQVTHEGSTVEKTVAPTECSGGGGSGGGGSQVQLVE SGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVI WYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEI VLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIY DASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPL

Antibody	Region	SEQ ID NO:	Sequence
			TFGGGTKVEIK
huDS6	LC DEC-205 mAb containing tumor mAb ScFv	725	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQAQLVQSGA EVVKPGASVKMSCKASGYTFTSYNMHWVKQTPGQGLEWIGYIYPG NGATNYNQKFQGKATLTADPSSSTAYMQISSLTSEDSAVYFCARGD SVPFAYWGQGTLVTVSAGGGGSGGGGSGGGGSGGGGSEIVLTQSP ATMSASPGERVTITCSAHSSVSFMHWFQQKPGTSPKLWIYSTSSLAS GVPARFGGSGSGTSYSLTISSMEAEDAATYYCQQRSSFPLTFGAGTK LELK
	LC tumor mAb containing DEC-205 mAb ScFv	726	EIVLTQSPATMSASPGERVTITCSAHSSVSFMHWFQQKPGTSPKLWI YSTSSLASGVPARFGGSGSGTSYSLTISSMEAEDAATYYCQQRSSFP LTFGAGTKLELKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
Lifastuzumab	LC DEC-205 mAb containing tumor mAb ScFv	737	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFSFSDFAMSWVRQAPGKGLEWVATIGRV AFHTYYPDSMKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARH RGFDVGHFDFWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQ MTQSPSSLSASVGDRVTITCRSSETLVHSSGNTYLEWYQQKPGKAP KLLIYRVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCFQGSF NPLTFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	738	DIQMTQSPSSLSASVGDRVTITCRSSETLVHSSGNTYLEWYQQKPGK APKLLIYRVSNRFSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCFQ GSFNPLTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV ESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVY YCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGG SEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRL LIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
Sacituzumab	LC DEC-205 mAb containing tumor mAb ScFv	782	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQSGS ELKKPGASVKVSCKASGYTFTNYGMNWVKQAPGQGLKWMGWIN TYTGEPTYTDDFKGRFAFSLDTSVSTAYLQISSLKADDTAVYFCARG GFGSSYWYFDVWGQGSLVTVSSGGGGSGGGGSGGGGSGGGGSDIQ LTQSPSSLSASVGDRVSITCKASQDVSIAVAWYQQKPGKAPKLLIYS ASYRYTGVPDRFSGSGSGTDFTLTISSLQPEDFAVYYCQQHYITPLTF GAGTKVEIK
	LC tumor mAb containing	783	DIQLTQSPSSLSASVGDRVSITCKASQDVSIAVAWYQQKPGKAPKLL IYSASYRYTGVPDRFSGSGSGTDFTLTISSLQPEDFAVYYCQQHYITP LTFGAGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE

Antibody	Region	SEQ ID NO:	Sequence
	DEC-205 mAb ScFv		AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWY DGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDA SNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFG GGTKVEIK
PR1A3	LC DEC-205 mAb containing tumor mAb ScFv	773	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVKLQQSGP ELKKPGETVKISCKASGYTFTEFGMNWVKQAPGKGLKWMGWINT KTGEATYVEEFKGRFAFSLETSATTAYLQINNLKNEDTAKYFCARW DFYDYVEAMDYWGQGTTVTVSSGGGGSGGGGSGGGGSGGGGSDI VMTQSQRFMSTSVGDRVSVTCKASQNVGTNVAWYQQKPGQSPKA LIYSASYRYSGVPDRFTGSGSGTDFTLTISNVQSEDLAEYFCHQYYT YPLFTFGSGTKLEMK
	LC tumor mAb containing DEC-205 mAb ScFv	774	DIVMTQSQRFMSTSVGDRVSVTCKASQNVGTNVAWYQQKPGQSPK ALIYSASYRYSGVPDRFTGSGSGTDFTLTISNVQSEDLAEYFCHQYY TYPLFTFGSGTKLEMKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV ESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVY YCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGG SEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRL LIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
Humanized PR1A3	LC DEC-205 mAb containing tumor mAb ScFv	821	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLL IYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNW PLTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTEFGMNWVRQAPGQGLEWMGWIN TKTGEATYVEEFKGRVTFTTDTSTSTAYMELRSLRSDDTAVYYCAR WDFAYYVEAMDYWGQGTTVTVSSGGGGSGGGGSGGGGSGGGGS DIQMTQSPSSLSASVGDRVTITCKASAAVGTYVAWYQQKPGKAPK LLIYSASYRKRGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCHQYYT YPLFTFGQGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	822	DIQMTQSPSSLSASVGDRVTITCKASAAVGTYVAWYQQKPGKAPK LLIYSASYRKRGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCHQYYT YPLFTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFY PREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVES GGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVI WYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEI VLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIY DASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPL TFGGGTKVEIK
Humanized Ab2-3	LC DEC-205 mAb containing tumor mAb ScFv	839	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLL IYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNW PLTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLQESG PGLVKPGGSLSLSCAASGFVFSSYDMSWVRQTPERGLEWVAYISSG GGITYAPSTVKGRFTVSRDNAKNTLYLQMNSLTSEDTAVYYCAAH

Antibody	Region	SEQ ID NO:	Sequence
			YFGSSGPFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQM TQSPASLSASVGDRVTITCRASENIFSYLAWYQQKPGKSPKLLVYNT RTLAEGVPSRFSGSGSGTDFSLTISSLQPEDFATYYCQHHYGTPFTFG SGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	840	DIQMTQSPASLSASVGDRVTITCRASENIFSYLAWYQQKPGKSPKLL VYNTRTLAEGVPSRFSGSGSGTDFSLTISSLQPEDFATYYCQHHYGT PFTFGSGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLT FGGGTKVEIK
IMAB362, CLAUDIXIMAB	LC DEC-205 mAb containing tumor mAb ScFv	728	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQQPGA ELVRPGASVKLSCKASGYTFTSYWINWVKQRPGQGLEWIGNIYPSD SYTNYNQKFKDKATLTVDKSSSTAYMQLSSPTSEDSAVYYCTRSW RGNSFDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQS PSSLTVTAGEKVTMSCKSSQSLLNSGNQKNYLTWYQQKPGQPPKLL IYWASTRESGVPDRFTGSGSGTDFTLTISSVQAEDLAVYYCQNDYSY PFTFGSGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	729	DIVMTQSPSSLTVTAGEKVTMSCKSSQSLLNSGNQKNYLTWYQQKP GQPPKLLIYWASTRESGVPDRFTGSGSGTDFTLTISSVQAEDLAVYY CQNDYSYPFTFGSGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCL LNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL SKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQV QLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
AMG595	LC DEC-205 mAb containing tumor mAb ScFv	698	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQSGRSLRLSCAASGFTFRNYGMHWVRQAPGKGLEWVAVIWY DGSDKYYADSVRGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DGYDILTGNPRDFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGG SDTVMTQTPLSSHVTLGQPASISCRSSQSLVHSDGNTYLSWLQQRPG QPPRLLIYRISRRFSGVPDRFSGSGAGTDFTLEISRVEAEDVGVYYCM QSTHVPRTFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	699	DTVMTQTPLSSHVTLGQPASISCRSSQSLVHSDGNTYLSWLQQRPG QPPRLLIYRISRRFSGVPDRFSGSGAGTDFTLEISRVEAEDVGVYYCM QSTHVPRTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLS KADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK

Antibody	Region	SEQ ID NO:	Sequence
ABT806	LC DEC-205 mAb containing tumor mAb ScFv	692	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLQESGP GLVKPSQTLSLTCTVSGYSISRDFAWNWIRQPPGKGLEWMGYISYN GNTRYQPSLKSRITISRDTSKNQFFLKLNSVTAADTATYYCVTASRG FPYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSM SVSVGDRVTITCHSSQDINSNIGWLQQKPGKSFKGLIYHGTNLDDGV PSRFSGSGSGTDYTLTISSLQPEDFATYYCVQYAQFPWTFGGGTKLE IK
	LC tumor mAb containing DEC-205 mAb ScFv	693	DIQMTQSPSSMSVSVGDRVTITCHSSQDINSNIGWLQQKPGKSFKGL IYHGTNLDDGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCVQYAQF PWTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
Sibrotuzumab	LC DEC-205 mAb containing tumor mAb ScFv	788	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKTSRYTFTEYTIHWVRQAPGQRLEWIGGINPNN GIPNYNQKFKGRVTITVDTSASTAYMELSSLRSEDTAVYYCARRRIA YGYDEGHAMDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDI VMTQSPDSLAVSLGERATINCKSSQSLLYSRNQKNYLAWYQQKPG QPPKLLIFWASTRESGVPDRFSGSGFGTDFTLTISSLQAEDVAVYYC QQYFSYPLTFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	789	DIVMTQSPDSLAVSLGERATINCKSSQSLLYSRNQKNYLAWYQQKP GQPPKLLIFWASTRESGVPDRFSGSGFGTDFTLTISSLQAEDVAVYY CQQYFSYPLTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCL LNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTL SKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQV QLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLE WVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDT AVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSG GGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQA PRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQR RNWPLTFGGGTKVEIK
DS-8895a variant 1	LC DEC-205 mAb containing tumor mAb ScFv	713	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLEWMGWINT YTGEPTYSDDFKGRVTITADTSTSTAYLELSSLRSEDTAVYYCATYY RYERDFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIVMT QSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLIY KVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVP YTFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb	714	DIVMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSP QLLIYKVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQG SHVPYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA

Antibody	Region	SEQ ID NO:	Sequence
	ScFv		DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV ESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVY YCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGG SEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRL LIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
DS-8895a variant 2	LC DEC-205 mAb containing tumor mAb ScFv	716	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQIQLVQSGAE VKKPGASVKVSCKASGYTFIDYSMHWVRQAPGQGLKWMGWINTY TGEPTYSDDFKGRFAFSLDTSTSTAYLELSSLRSEDTAVYYCATYYR YERDFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDVLMTQS PLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQSPQLLIYKV SNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTF GQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	717	DVLMTQSPLSLPVTPGEPASISCRSSQSIVHSSGITYLEWYLQKPGQS PQLLIYKVSNRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQ GSHVPYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLN NFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSK ADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQL VESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWV AVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAV YYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGG GSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPR LLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
MEDI-547	LC DEC-205 mAb containing tumor mAb ScFv	743	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLLESGG GLVQPGGSLRLSCAASGFTFSHYMMAWVRQAPGKGLEWVSRIGPS GGPTHYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAGY DSGYDYVAVAGPAEYFQHWGQGTLVTVSSGGGGSGGGGSGGGGS GGGGSDIQMTQSPSSLSASVGDRVTITCRASQSISTWLAWYQQKPG KAPKLLIYKASNLHTGVPSRFSGSGSGTEFSLTISGLQPDDFATYYCQ QYNSYSRTFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	744	DIQMTQSPSSLSASVGDRVTITCRASQSISTWLAWYQQKPGKAPKLL IYKASNLHTGVPSRFSGSGSGTEFSLTISGLQPDDFATYYCQQYNSYS RTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWY DGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDA SNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFG GGTKVEIK
Narnatumab	LC DEC-205 mAb containing tumor mAb ScFv	749	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFTFSSYLMTWVRQAPGKGLEWVANIKQD GSEKYYVDSVKGRFTISRDNAKNSLNLQMNSLRAEDTAVYYCTRD GYSSGRHYGMDVWGQGTTVIVSSGGGGSGGGGSGGGGSGGGGSEI

Antibody	Region	SEQ ID NO:	Sequence
			VLTQSPATLSLSPGERATLSCRASQSVSRYLAWYQQKPGQAPRLLIY DASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSNWPR TFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	750	EIVLTQSPATLSLSPGERATLSCRASQSVSRYLAWYQQKPGQAPRLL IYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRSNWP RTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWY DGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDA SNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFG GGTKVEIK
RG7841	LC DEC-205 mAb containing tumor mAb ScFv	776	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGP ALVKPTQTLTLTCTVSGFSLTGYSVNWIRQPPGKALEWLGMIWGDG STDYNSALKSRLTISKDTSKNQVVLTMTNMDPVDTATYYCARDYY FNYASWFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCSASQGISNYLNWYQQKPGKTVKLLIYYT SNLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQYSELPWTF GQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	777	DIQMTQSPSSLSASVGDRVTITCSASQGISNYLNWYQQKPGKTVKLL IYYTSNLHSGVPSRFSGSGSGTDYTLTISSLQPEDFATYYCQQYSELP WTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
Farletuzumab	LC DEC-205 mAb containing tumor mAb ScFv	722	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GVVQPGRSLRLSCSASGFTFSGYGLSWVRQAPGKGLEWVAMISSGG SYTYYADSVKGRFAISRDNAKNTLFLQMDSLRPEDTGVYFCARHG DDPAWFAYWGQGTPVTVSSGGGGSGGGGSGGGGSGGGGSDIQLT QSPSSLSASVGDRVTITCSVSSSISSNNLHWYQQKPGKAPKPWIYGT SNLASGVPSRFSGSGSGTDYTFTISSLQPEDIATYYCQQWSSYPYMY TFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	723	DIQLTQSPSSLSASVGDRVTITCSVSSSISSNNLHWYQQKPGKAPKP WIYGTSNLASGVPSRFSGSGSGTDYTFTISSLQPEDIATYYCQQWSS YPYMYTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV ESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVY YCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGG SEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRL LIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
Mirvetuximab	LC DEC-205	746	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI

Antibody	Region	SEQ ID NO:	Sequence
	mAb containing tumor mAb ScFv		YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVVKPGASVKISCKASGYTFTGYFMNWVKQSPGQSLEWIGRIHPYD GDTFYNQKFQGKATLTVDKSSNTAHMELLSLTSEDFAVYYCTRYD GSRAMDYWGQGTTVTVSSGGGGSGGGGSGGGGSGGGGSDIVLTQS PLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPGQQPRLLIYR ASNLEAGVPDRFSGSGSKTDFTLTISPVEAEDAATYYCQQSREYPYT FGGGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	747	DIVLTQSPLSLAVSLGQPAIISCKASQSVSFAGTSLMHWYHQKPGQQ PRLLIYRASNLEAGVPDRFSGSGSKTDFTLTISPVEAEDAATYYCQQ SREYPYTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV ESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVY YCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGG SEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRL LIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
J591 variant1	LC DEC-205 mAb containing tumor mAb ScFv	731	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLQQSGP ELKKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNINPNNG GTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWN FDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQSHKF MSTSVGDRVSIICKASQDVGTAVDWYQQKPGQSPKLLIYWASTRHT GVPDRFTGSGSGTDFTLTITNVQSEDLADYFCQQYNSYPLTFGAGT MLDLK
	LC tumor mAb containing DEC-205 mAb ScFv	732	DIVMTQSHKFMSTSVGDRVSIICKASQDVGTAVDWYQQKPGQSPKL LIYWASTRHTGVPDRFTGSGSGTDFTLTITNVQSEDLADYFCQQYNS YPLTFGAGTMLDLKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFY PREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVES GGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVI WYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEI VLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIY DASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPL TFGGGTKVEIK
J591 variant 2	LC DEC-205 mAb containing tumor mAb ScFv	734	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLQQSGP ELVKPGTSVRISCKTSGYTFTEYTIHWVKQSHGKSLEWIGNINPNNG GTTYNQKFEDKATLTVDKSSSTAYMELRSLTSEDSAVYYCAAGWN FDYWGQGTTLTVSSGGGGSGGGGSGGGGSGGGGSNIVMTQSPKSM SMSVGERVTLTCKASENVVTYVSWYQQKPEQSPKLLIYGASNRYT GVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGYSYPYTFGGGT KLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	735	NIVMTQSPKSMSMSVGERVTLTCKASENVVTYVSWYQQKPEQSPK LLIYGASNRYTGVPDRFTGSGSATDFTLTISSVQAEDLADYHCGQGY SYPYTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFY PREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADY EKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVES

Antibody	Region	SEQ ID NO:	Sequence
			GGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVI WYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYC ARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEI VLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIY DASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPL TFGGGTKVEIK
Rovalpituzumab	LC DEC-205 mAb containing tumor mAb ScFv	779	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGA EVKKPGASVKVSCKASGYTFTNYGMNWVRQAPGQGLEWMGWIN TYTGEPTYADDFKGRVTMTTDTSTSTAYMELRSLRSDDTAVYYCA RIGDSSPSDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVMT QSPATLSVSPGERATLSCKASQSVSNDVVWYQQKPGQAPRLLIYYA SNRYTGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQDYTSPWTFG QGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	780	EIVMTQSPATLSVSPGERATLSCKASQSVSNDVVWYQQKPGQAPRL LIYYASNRYTGIPARFSGSGSGTEFTLTISSLQSEDFAVYYCQQDYTS PWTFGQGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYP REAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESG GGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIW YDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCA RDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIV LTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYD ASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
PF-06647020	LC DEC-205 mAb containing tumor mAb ScFv	770	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGP EVKKPGASVKVSCKASGYTFTDYAVHWVRQAPGKRLEWIGVISTY NDYTYNNQDFKGRVTMTRDTSASTAYMELSRLRSEDTAVYYCARG NSYFYALDYWGQGTSVTVSSGGGGSGGGGSGGGGSGGGGSEIVLT QSPATLSLSPGERATLSCRASESVDSYGKSFMHWYQQKPGQAPRLLI YRASNLESGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQSNEDPW TFGGGTKLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	771	EIVLTQSPATLSLSPGERATLSCRASESVDSYGKSFMHWYQQKPGQ APRLLIYRASNLESGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQS NEDPWTFGGGTKLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNN FYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKA DYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLV ESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVA VIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVY YCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGG SEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRL LIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRN WPLTFGGGTKVEIK
Antibody to PTK7	LC DEC-205 mAb containing tumor mAb ScFv	689	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSSYAFHWVRQAPGKGLEWVAVISYD GSIKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARTY YFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPDF QSVTPKEKVTITCRASQSIGSSLHWYQQKPDQSPKLLIKYASQSFSG

Antibody	Region	SEQ ID NO:	Sequence
			VPSRFSGSGSGTDFTLTINSLEAEDAAAYYCHQSSSLPITFGQGTRLEIK
	LC tumor mAb containing DEC-205 mAb ScFv	690	EIVLTQSPDFQSVTPKEKVTITCRASQSIGSSLHWYQQKPDQSPKLLIKYASQSFSGVPSRFSGSGSGTDFTLTINSLEAEDAAAYYCHQSSSLPITFGQGTRLEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKVEIK		LC tumor mAb containing DEC-205 mAb ScFv	786	DVVMTQSPLSLPVTLGQPASISCRSSQSLLHSSGNTYLEYFQQRPGQSPRPLIYKISTRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKVEIK
Ladiratuzumab	LC DEC-205 mAb containing tumor mAb ScFv	785	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGAEVKKPGASVKVSCKASGLTIEDYYMHWVRQAPGQGLEWMGWIDPENGDTEYGPKFQGRVTMTRDTSINTAYMELSRLRSDDTAVYYCAVHNAHYGTWFAYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDVVMTQSPLSLPVTLGQPASISCRSSQSLLHSSGNTYLEYFQQRPGQSPRPLIYKISTRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	786	DVVMTQSPLSLPVTLGQPASISCRSSQSLLHSSGNTYLEYFQQRPGQSPRPLIYKISTRFSGVPDRFSGSGSGTDFTLKISRVEAEDVGVYYCFQGSHVPYTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKVEIK
Cirmtuzumab	LC DEC-205 mAb containing tumor mAb ScFv	707	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLQESGPGLVKPSQTLSLTCTVSGYAFTAYNIHWVRQAPGQGLEWMGSFDPYDGGSSYNQKFKDRLTISKDTSKNQVVLTMTNMDPVDTATYYCARGWYYFDYWGHGTLVTVSSGGGGSGGGGSGGGGSGGGGSGGGGSDIVMTQTPLSLPVTPGEPASISCRASKSISKYLAWYQQKPGQAPRLLIYSGSTLQSGIPPRFSGSGYGTDFTLTINNIESEDAAYYFCQQHDESPYTFGEGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	708	DIVMTQTPLSLPVTPGEPASISCRASKSISKYLAWYQQKPGQAPRLLIYSGSTLQSGIPPRFSGSGYGTDFTLTINNIESEDAAYYFCQQHDESPYTFGEGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKVEIK
Antibody to MAGE-A3	LC DEC-205 mAb containing	740	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE

Antibody	Region	SEQ ID NO:	Sequence
	tumor mAb ScFv		AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCTASGFRFRSHGMHWVRQAPGKGLEWVAVISYD GNNKLYADSVKGRITISRDNSKNTLFLQMNNVRAEDTAVYYCASP YTSDWQYFQYWGQGTLVIVSSGGGGSGGGGSGGGGSGGGGSEIVM TQSPATLSVSPGERATFSCRASQNISTTLAWYQQKPGQAPRLLIYDT STRATGIPARFSGSGSGTEFTLTISSLQSEDLAVYYCQQSNSWPLTFG GGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	741	EIVMTQSPATLSVSPGERATFSCRASQNISTTLAWYQQKPGQAPRLL IYDTSTRATGIPARFSGSGSGTEFTLTISSLQSEDLAVYYCQQSNSWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWY DGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDA SNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFG GGTKVEIK
Antibody to NY-ESO-1	LC DEC-205 mAb containing tumor mAb ScFv	755	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSGG GVVRPGGSLRLSCAASGFSFIDYGMSWVRQVPGKGLEWVAGMNW SGDKKGHAESVKGRFIISRDNAKNTLYLEMSSLRVEDTALYFCARG EYSNRFDPRGRGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIVMTQ TPLSLPVTLGQPASLSCRSSQSLVFTDGNTYLNWFQQRPGQSPRRLI YKVSSRDPGVPDRFSGTGSGTDFTLEISRVEAEDIGVYYCMQGTHW PPIFGQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	756	DIVMTQTPLSLPVTLGQPASLSCRSSQSLVFTDGNTYLNWFQQRPGQ SPRRLIYKVSSRDPGVPDRFSGTGSGTDFTLEISRVEAEDIGVYYCM QGTHWPPIFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLL NNFYPREAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLS KADYEKHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQ LVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEW VAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTA VYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGG GGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAP RLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRR NWPLTFGGGTKVEIK
Trastuzumab	LC DEC-205 mAb containing tumor mAb ScFv	794	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVESGG GLVQPGGSLRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTN GYTRYADSVKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWG GDGFYAMDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQM TQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYS ASFLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTF GQGTKVEIK
	LC tumor mAb containing DEC-205 mAb ScFv	795	DIQMTQSPSSLSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKL LIYSASFLYSGVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTP PTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWY DGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR

Antibody	Region	SEQ ID NO:	Sequence
			DLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDA SNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTFG GGTKVEIK
	LC DEC205 mAb containing tumor mAb scFv (LH,25mer)	799	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLI YDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSDIQMTQSPSS LSASVGDRVTITCRASQDVNTAVAWYQQKPGKAPKLLIYSASFLYS GVPSRFSGSRSGTDFTLTISSLQPEDFATYYCQQHYTTPPTFGQGTKV EIKGGGGSGGGGSGGGGSGGGGSGGGGSEVQLVESGGGLVQPGGS LRLSCAASGFNIKDTYIHWVRQAPGKGLEWVARIYPTNGYTRYADS VKGRFTISADTSKNTAYLQMNSLRAEDTAVYYCSRWGGDGFYAM DYWGQGTLVTVSS

TABLE 11. Fusion Sequences – CD40 fusion with DEC205

Antibody	Region	SEQ ID NO:	Sequence
DEC205 variant 1	HC DEC205 mAb with CD40 mAb ScFv	243	QVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGL EWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAED TAVYYCARDLWGWYFDYWGQGTLVTVSSASTKGPSVFPLAPSSKS TSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLY SLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCP PCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVK FNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKE YKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSL TCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTV DKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGS QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQG LEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSD DTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGG GGSGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWL AWYQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPE DFATYYCQQANIFPLTFGGGTKVEIK
	HC CD40 mAb with DEC205 mAb ScFv	242	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQG LEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSD DTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSV FPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPA VLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKS CDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDV SHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ DWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREE MTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGG GGSGGGGSQVQLVESGGGVVQPGRSLRLSCAASGFTFSNYGMYWV RQAPGKGLEWVAVIWYDGSNKYYADSVKGRFTISRDNSKNTLYLQ MNSLRAEDTAVYYCARDLWGWYFDYWGQGTLVTVSSGGGGSGG GGSGGGGSGGGGSEIVLTQSPATLSLSPGERATLSCRASQSVSSYLA WYQQKPGQAPRLLIYDASNRATGIPARFSGSGSGTDFTLTISSLEPED FAVYYCQQRRNWPLTFGGGTKVEIK
	LC DEC205 mAb containing CD40 mAb scFv	244	EIVLTQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLL IYDASNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNW PLTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI

Antibody	Region	SEQ ID NO:	Sequence
			NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK
	LC CD40 mAb containing DEC205 mAb scFv	800	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVESGG GVVQPGRSLRLSCAASGFTFSNYGMYWVRQAPGKGLEWVAVIWY DGSNKYYADSVKGRFTISRDNSKNTLYLQMNSLRAEDTAVYYCAR DLWGWYFDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSEIVL TQSPATLSLSPGERATLSCRASQSVSSYLAWYQQKPGQAPRLLIYDA SNRATGIPARFSGSGSGTDFTLTISSLEPEDFAVYYCQQRRNWPLTF GGGTKVEIK
DEC205 variant 2	HC DEC205 mAb with CD40 mAb ScFv	256	EVQLVQSGAEVKKPGESLRISCKGSGDSFTTYWIGWVRQMPGKGL EWMGIIYPGDSDTIYSPSFQGQVTISADKSISTAYLQWSSLKASDTA MYYCTRGDRGVDYWGQGTLVTVSSASTKGPSVFPLAPSSKSTSGG TAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPAVLQSSGLYSLSS VVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKSCDKTHTCPPCP APELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDVSHEDPEVKFNW YVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQDWLNGKEYKC KVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREEMTKNQVSLTCL VKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGSFFLYSKLTVDK SRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGGGGSGGGGSQV QLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLE WMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDT AVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGG SGGGGSGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAW YQQKPGKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDF ATYYCQQANIFPLTFGGGTKVEIK
	HC CD40 mAb with DEC205 mAb ScFv	255	QVQLVQSGAEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQG LEWMGWINPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSD DTAVYYCARDQPLGYCTNGVCSYFDYWGQGTLVTVSSASTKGPSV FPLAPSSKSTSGGTAALGCLVKDYFPEPVTVSWNSGALTSGVHTFPA VLQSSGLYSLSSVVTVPSSSLGTQTYICNVNHKPSNTKVDKKVEPKS CDKTHTCPPCPAPELLGGPSVFLFPPKPKDTLMISRTPEVTCVVVDV SHEDPEVKFNWYVDGVEVHNAKTKPREEQYNSTYRVVSVLTVLHQ DWLNGKEYKCKVSNKALPAPIEKTISKAKGQPREPQVYTLPPSREE MTKNQVSLTCLVKGFYPSDIAVEWESNGQPENNYKTTPPVLDSDGS FFLYSKLTVDKSRWQQGNVFSCSVMHEALHNHYTQKSLSLSPGGG GGSGGGGSEVQLVQSGAEVKKPGESLRISCKGSGDSFTTYWIGWVR QMPGKGLEWMGIIYPGDSDTIYSPSFQGQVTISADKSISTAYLQWSS LKASDTAMYYCTRGDRGVDYWGQGTLVTVSSGGGGSGGGGSGGG GSGGGGSDIQMTQSPSSLSASVGDRVTITCRASQGISRWLAWYQQK PEKAPKSLIYAASSLQSGVPSRFSGSGSGTDFTLTISGLQPEDFATYY CQQYNSYPRTFGQGTKVEIK
	LC DEC205 mAb containing CD40 mAb scFv	257	DIQMTQSPSSLSASVGDRVTITCRASQGISRWLAWYQQKPEKAPKS LIYAASSLQSGVPSRFSGSGSGTDFTLTISGLQPEDFATYYCQQYNSY PRTFGQGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPR EAKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYE KHKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSQVQLVQSG AEVKKPGASVKVSCKASGYTFTGYYMHWVRQAPGQGLEWMGWI NPDSGGTNYAQKFQGRVTMTRDTSISTAYMELNRLRSDDTAVYYC ARDQPLGYCTNGVCSYFDYWGQGTLVTVSSGGGGSGGGGSGGGG SGGGGSDIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKP GKAPNLLIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYC QQANIFPLTFGGGTKVEIK

Antibody	Region	SEQ ID NO:	Sequence
	LC CD40 mAb containing DEC205 mAb scFv	801	DIQMTQSPSSVSASVGDRVTITCRASQGIYSWLAWYQQKPGKAPNL LIYTASTLQSGVPSRFSGSGSGTDFTLTISSLQPEDFATYYCQQANIFP LTFGGGTKVEIKRTVAAPSVFIFPPSDEQLKSGTASVVCLLNNFYPRE AKVQWKVDNALQSGNSQESVTEQDSKDSTYSLSSTLTLSKADYEK HKVYACEVTHQGLSSPVTKSFNRGECGGGGSGGGGSEVQLVQSGA EVKKPGESLRISCKGSGDSFTTYWIGWVRQMPGKGLEWMGIIYPGD SDTIYSPSFQGQVTISADKSISTAYLQWSSLKASDTAMYYCTRGDRG VDYWGQGTLVTVSSGGGGSGGGGSGGGGSGGGGSDIQMTQSPSSL SASVGDRVTITCRASQGISRWLAWYQQKPEKAPKSLIYAASSLQSG VPSRFSGSGSGTDFTLTISGLQPEDFATYYCQQYNSYPRTFGQGTKV EIK

Immune-Stimulatory Compounds

[0304] In some embodiments, the immune-stimulatory conjugates described herein further comprise an immune-stimulatory compound. An immune-stimulatory compound can be a small molecule, a compound or molecule that binds to a protein target and can activate the target protein's function, or a compound that binds to a protein target and can inhibit the protein target's function, resulting in immune stimulation or modulation. In certain embodiments, an immune-stimulatory compound of a conjugate (i.e., attached to an antibody construct either directly or via a linker) can stimulate or activate its protein target with no or minimal processing of the conjugate. In certain embodiments, an immune-stimulatory compound of a conjugate (i.e., attached to an antibody construct either directly or via a linker) can inhibit its protein target with no or minimal processing of the conjugate. In this context, processing refers to degradation of the antibody construct or cleavage of the linker to liberate the immune-stimulatory compound or degredation product of the conjugate containing the immune-stimulatory compound. In certain embodiments, the protein target of the immune-stimulatory compound is an extracellular protein target and is located on the cell surface membrane or cellular compartments in communication with the cell surface, such as in the endoplasmic reticulum (ER). In certain embodiments, the protein target is intracellular, such as in the cytoplasm.

[0305] In some embodiments, an immune-stimulatory compound can activate immune cells. In some embodiments, an immune-stimulatory compound can reduce inhibition of immune cells. In some embodiments, an immune-stimulatory compound can stimulate immune activation by triggering degradation of a protein target.

[0306] In some embodiments, an immune-stimulatory compound can be a molecule or compound whose action on its target can lead to immune stimulation by direct immune cell activation. In some embodiments, the immune activation can be indirect by alteration of the immune suppressive microenvironment of a tumor (e.g., removing an immunosuppressive signal or altering an immunosuppressive state). In some embodiments, the immune-stimulatory

compound's activity can be both direct and indirect. In certain embodiments, an immune-stimulatory conjugate can alter the activity of its protein target in cells having an antigen bound by the conjugate as compared to activity of the protein target in non-antigen bearing cells (i.e., the immune-stimulatory activity is antigen-specific).

[0307] In certain embodiments, the immune-stimulatory compound can be coupled to an Fc domain or other portion of an antibody construct via a linker. In each of the embodiments described herein, the immune-stimulatory compound can be coupled to the antibody construct via a linker.

[0308] An immune-stimulatory compound can be a Pattern recognition receptor (PRR) agonist. Pattern recognition receptors (PRRs) can recognize pathogen-associated molecular patterns (PAMPs) and damage-associated molecular patterns (DAMPs). A PRR can be membrane bound. A PRR can be cytosolic. A PAMP molecule can be a toll-like receptor agonist. A PRR can be a toll-like receptor (TLR). A PRR can be RIG-I-like receptor. A PRR can be a receptor kinase. A PRR can be a C-type lectin receptor. A PRR can be a NOD-like receptor. A PRR can be TLR1, TLR2, TLR3, TLR4, TLR5, TLR6, TLR7, TLR8, TLR9, TLR10, TLR11, TLR12, or TLR13.

[0309] A PRR agonist can be a damage-associated molecular pattern (DAMP) molecule. A DAMP molecule can be an intracellular protein. A DAMP molecule can be a heat-shock protein. A DAMP molecule can be an HMGB1 protein. A DAMP molecule can be a protein derived from the extracellular matrix that is generated after tissue injury. A DAMP molecule can be a hyaluronan fragment. A DAMP molecule can be DNA. A DAMP molecule can be RNA. A DAMP molecule can be an S100 molecule. A DAMP molecule can be a nucleotide(s). A DAMP molecule can be ATP. A DAMP molecule can be a nucleoside(s). A DAMP molecule can be an adenosine. A DAMP molecule can be uric acid.

[0310] In some embodiments, the immune-stimulatory compound can be a Toll-like receptor agonist, a RIG-I agonist, a STING agonist, a GPCR agonist, an ion channel agonist, a membrane transporter agonist, an ER protein agonist, a beta-catenin pathway inhibitor, a kinase inhibitor, a TNIK inhibitor, a Tankyrase inhibitor, a GPCR antagonist, an HSP90 inhibitor, or an AAA-ATPase p97 inhibitor. In some embodiments, the immune-stimulatory compound can be a Toll-like receptor agonist, a RIG-I agonist or a STING agonist. In some embodiments, the immune-stimulatory compound can be a beta-catenin pathway inhibitor, such as a TNIK inhibitor or a Tankyrase inhibitor.

[0311] In some embodiments, the immune-stimulatory compound is a Toll-like receptor agonist. A toll-like receptor agonist can be any molecule that acts as an agonist to at least one toll-like receptor. In some embodiments, the Toll-like receptor agonist can be a molecule selected from a CpG oligonucleotide, Poly G10, Poly G3, Poly I:C, a lipopolysaccharide, a zymosan, a bacterial

flagella protein (e.g., flagellin), Pam_3CSK_4, $PamCysPamSK_4$, dsRNA, ssRNA, a diacylated lipopeptide, a bacterial lipoprotein, a triacylated lipoprotein, lipoteichoic acid, or a peptidoglycan (such as a bacterial peptidoglycan).

[0312] In some embodiments, an immune-stimulatory compound is not a toll-like receptor agonist. In some embodiments, a toll-like receptor agonist is not a naturally occurring molecule, such as CpG oligonucleotide, a lipopolysaccharide, a zymosan, a bacterial flagella protein (e.g., flagellin), Pam_3CSK_4, $PamCysPamSK_4$, dsRNA, ssRNA, a diacylated lipopeptide, a bacterial lipoprotein, a triacylated lipoprotein, lipoteichoic acid, or a peptidoglycan (such as a bacterial peptidoglycan). In some further embodiments, a toll-like receptor agonist is not a synthetic nucleic acid, such as Poly G10, Poly G3 or Poly I:C.

[0313] In some embodiments, a toll-like receptor agonist can be a synthetic small molecule. A toll-like receptor agonist can be imiquimod. A toll-like receptor agonist can be CL307. A toll-like receptor agonist can be S-27609. A toll-like receptor agonist can be resiquimod. A toll-like receptor agonist can be UC-IV150. A toll-like receptor agonist can be gardiquimod. A toll-like receptor agonist can be motolimod. A toll-like receptor agonist can be a motolimod analog. A toll-like receptor agonist can be VTX-1463. A toll-like receptor agonist can be GS-9620. A toll-like receptor agonist can be GSK2245035. A toll-like receptor agonist can be TMX-101. A toll-like receptor agonist can be TMX-201. A toll-like receptor agonist can be TMX-202. A toll-like receptor agonist can be isatoribine. A toll-like receptor agonist can be AZD8848. A toll-like receptor agonist can be MEDI9197. A toll-like receptor agonist can be 3M-051. A toll-like receptor agonist can be 3M-852. A toll-like receptor agonist can be 3M-052. A toll-like receptor agonist can be 3M-854A. A toll-like receptor agonist can be S-34240. A toll-like receptor agonist can be CL663. A toll-like receptor agonist can be KU34B.

[0314] A RIG-I agonist can be KIN1148. A RIG-I agonist can be SB-9200. A RIG-I agonist comprises a 5′ppp-dsRNA.

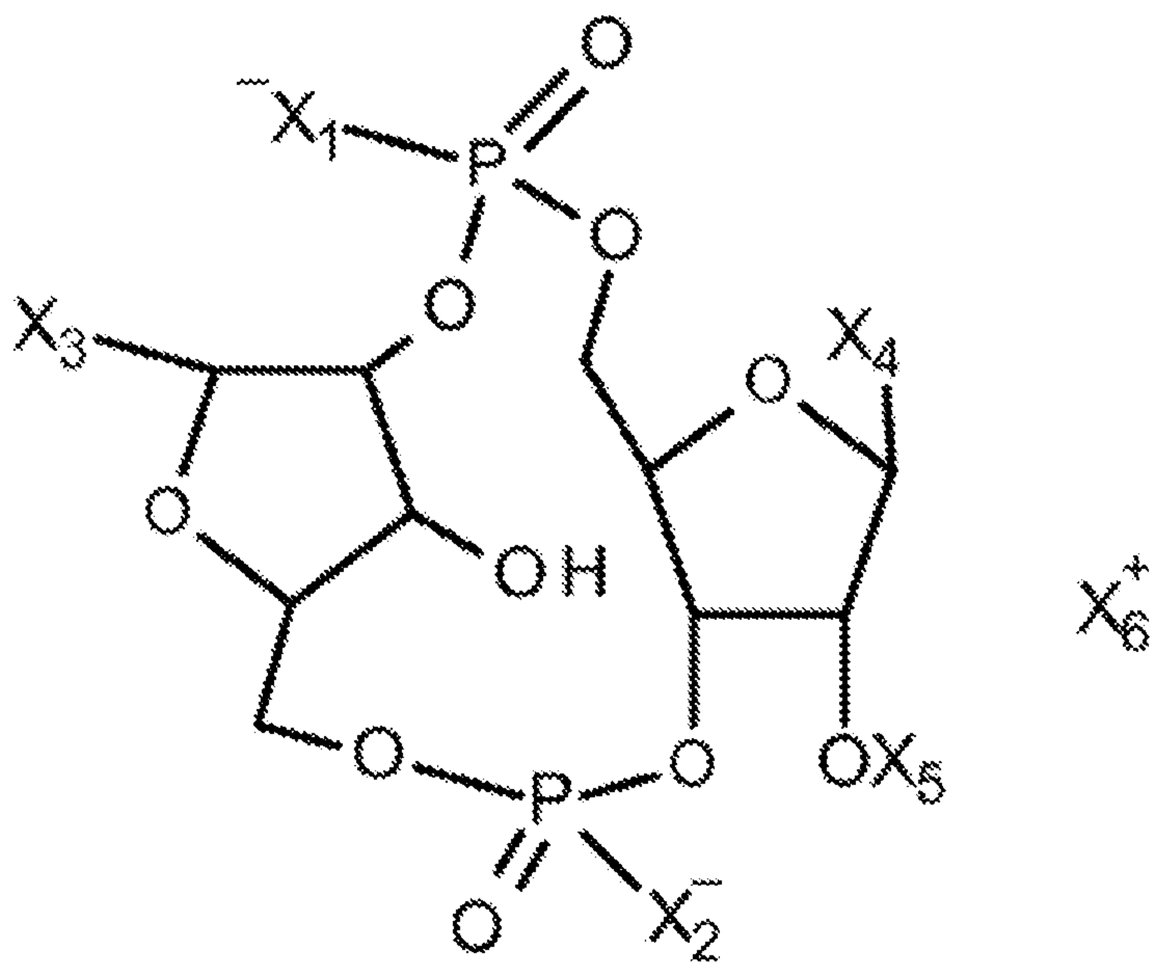
[0315] In some embodiments, the immune-stimulatory compound can comprise a non-naturally occurring chemotype, such as a substituted pyrimidine, a substituted purine, a substituted guanine nucleoside, a substituted 8-oxoadenine, a substituted imidazoquinoline, a substituted thiazoquinoline, a substituted 2-aminoimidazole, a substituted furo[2,3-c]pyridine, a substituted pyrazine, a substituted furo[2,3-c]quinoline, a substituted 2-aminobenzimidazole, a substituted 2-aminoquinoline, or a substituted 2-aminobenzazepine.

[0316] In certain embodiments, the immune-stimulatory compound can comprise S-27609, CL307, UC-IV150, imiquimod, gardiquimod, resiquimod, motolimod, VTS-1463, GS-9620, GSK2245035, TMX-101, TMX-201, TMX-202, isatoribine, AZD8848, MEDI9197, 3M-051,

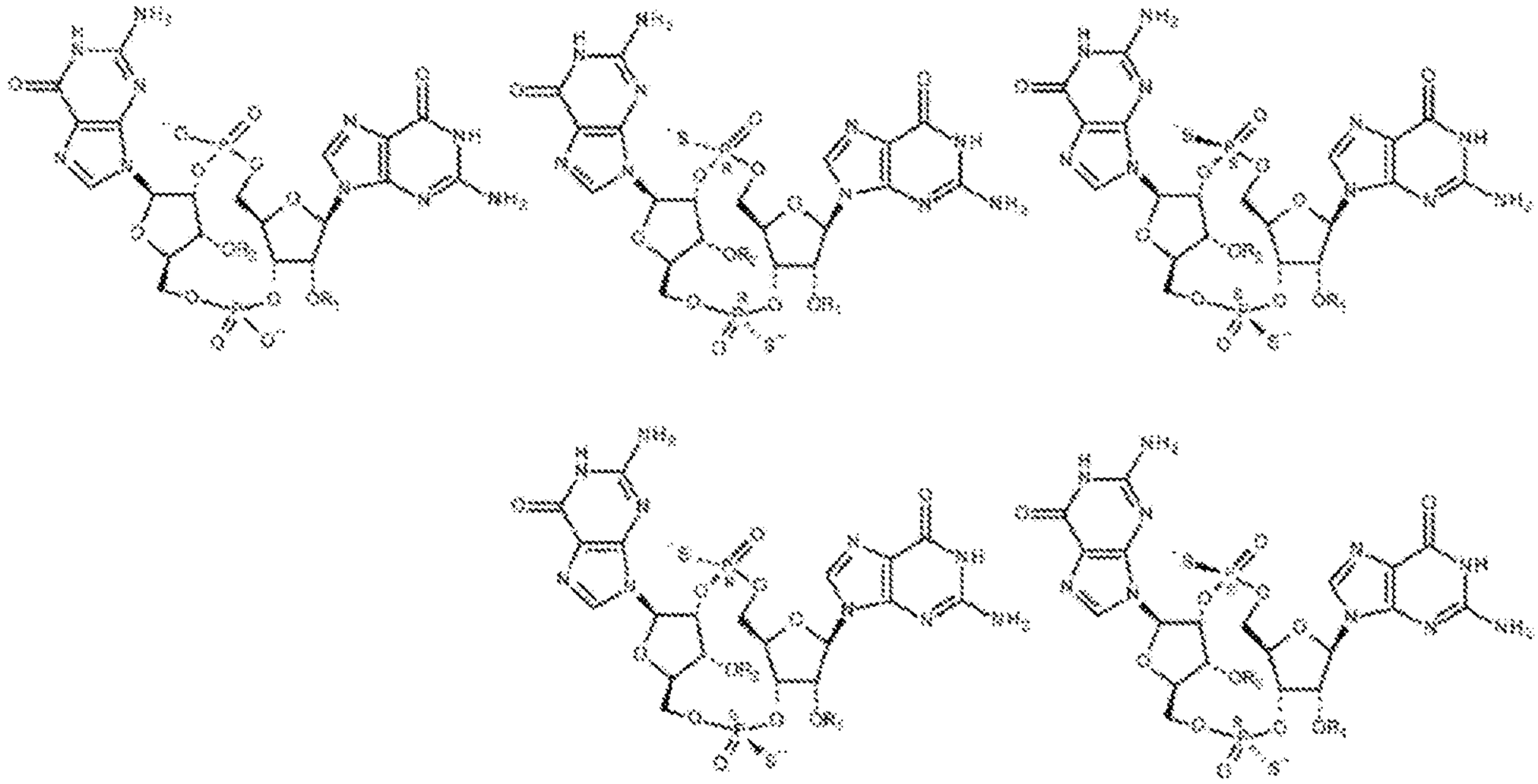
3M-852, 3M-052, 3M-854A, S-34240, KU34B, SB9200, SB11285, 8-substituted imidazo[1,5-a]pyridine, or CL663.

[0317] An immune-stimulatory compound can comprise an inhibitor of TGFbeta, Beta-Catenin, PI3K-beta, STAT3, IL-10, IDO or TDO. The immune-stimulatory compound can comprise LY2109761, GSK263771, iCRT3, iCRT5, iCRT14, LY2090314, CGX-1321, PRI-724, BC21, ZINCO2092166, LGK974, IWP2, LY3022859, LY364947, SB431542, AZD8186, SD-208, indoximod (NLG8189), F001287, GDC-0919, epacadostat (INCB024360), RG70099, 1-methyl-L-tryptophan, methylthiohydantoin tryptophan, brassinin, annulin B, exiguamine A, PIM, LM10, 8-substituted 2-amino-3H-benzo[b]azepine-4-carboxamide, or INCB023843.

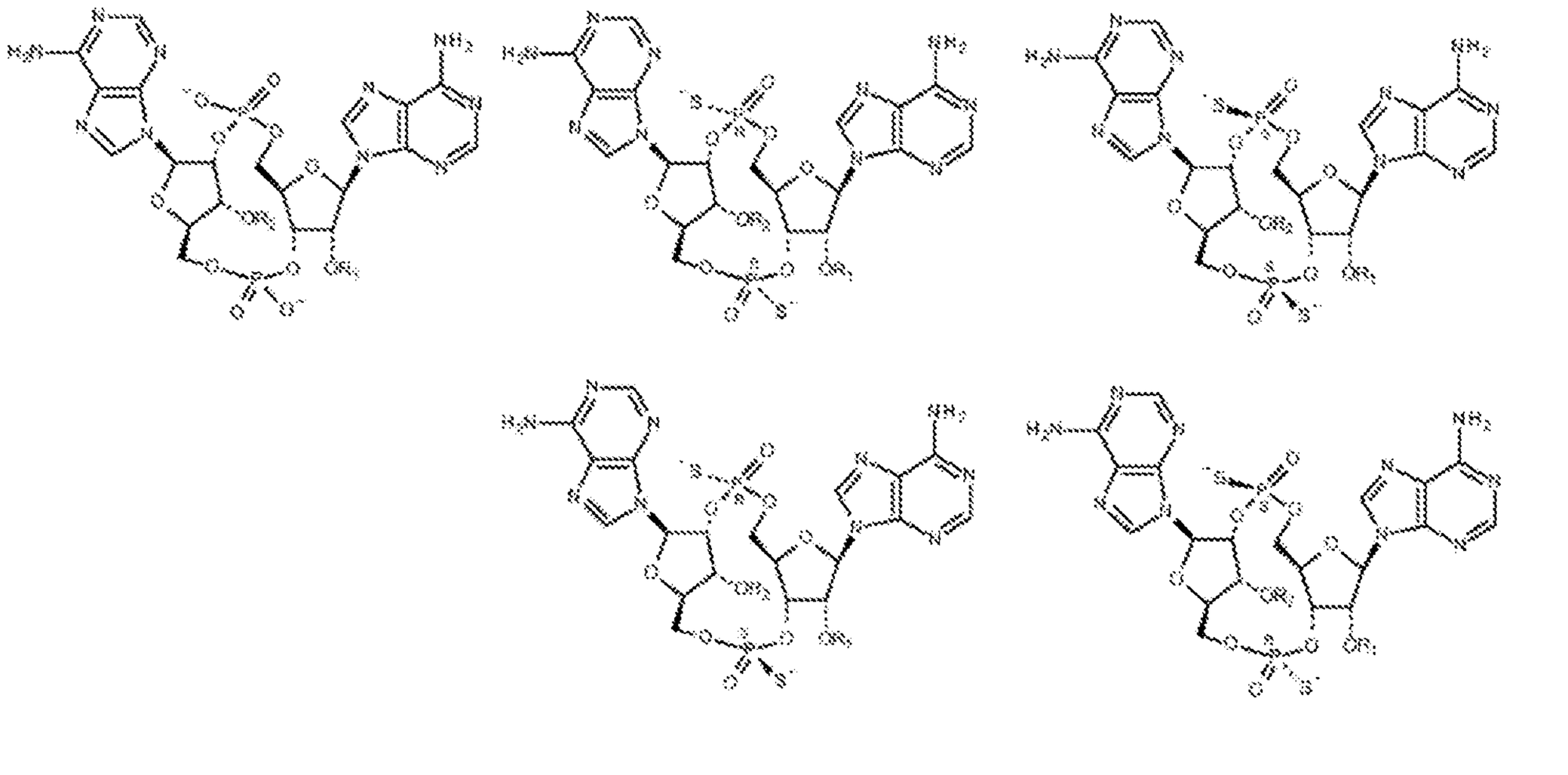
[0318] Additionally, stimulator of interferon genes (STING) can act as a cytosolic DNA sensor wherein cytosolic DNA and unique bacterial nucleic acids called cyclic dinucleotides are recognized by STING, and therefore STING agonists. In certain embodiments, the STING agonist can comprise a cyclic dinucleotide. Other non-limiting examples of STING agonists include:



[0319] , wherein in some embodiments, $X_1=X_2=O$; $X_3=G$; $X_4=G$; $X_5=CO(CH_2)_{12}CH_3$; $X_6=2$ TEAH; in some embodiments, $X_1=X_2=S$ [R_p,R_p]; $X_3=G$; $X_4=A$; $X_5=H$; $X_6=2$ TEAH; in some embodiments, $X_1=X_2=S$ [R_p,R_p] ; $X_3=A$; $X_4=A$; $X_5=H$; $X_6=2$ Na; in some embodiments, $X_1=X_2=S$ [R_p,R_p] ; $X_3=A$; $X_4=A$; $X_5=H$; $X_6=2$ NH_4; and in some embodiments, $X_1=X_2=O$; $X_3=G$; $X_4=A$; $X_5=H$; $X_6=2$ TEAH;



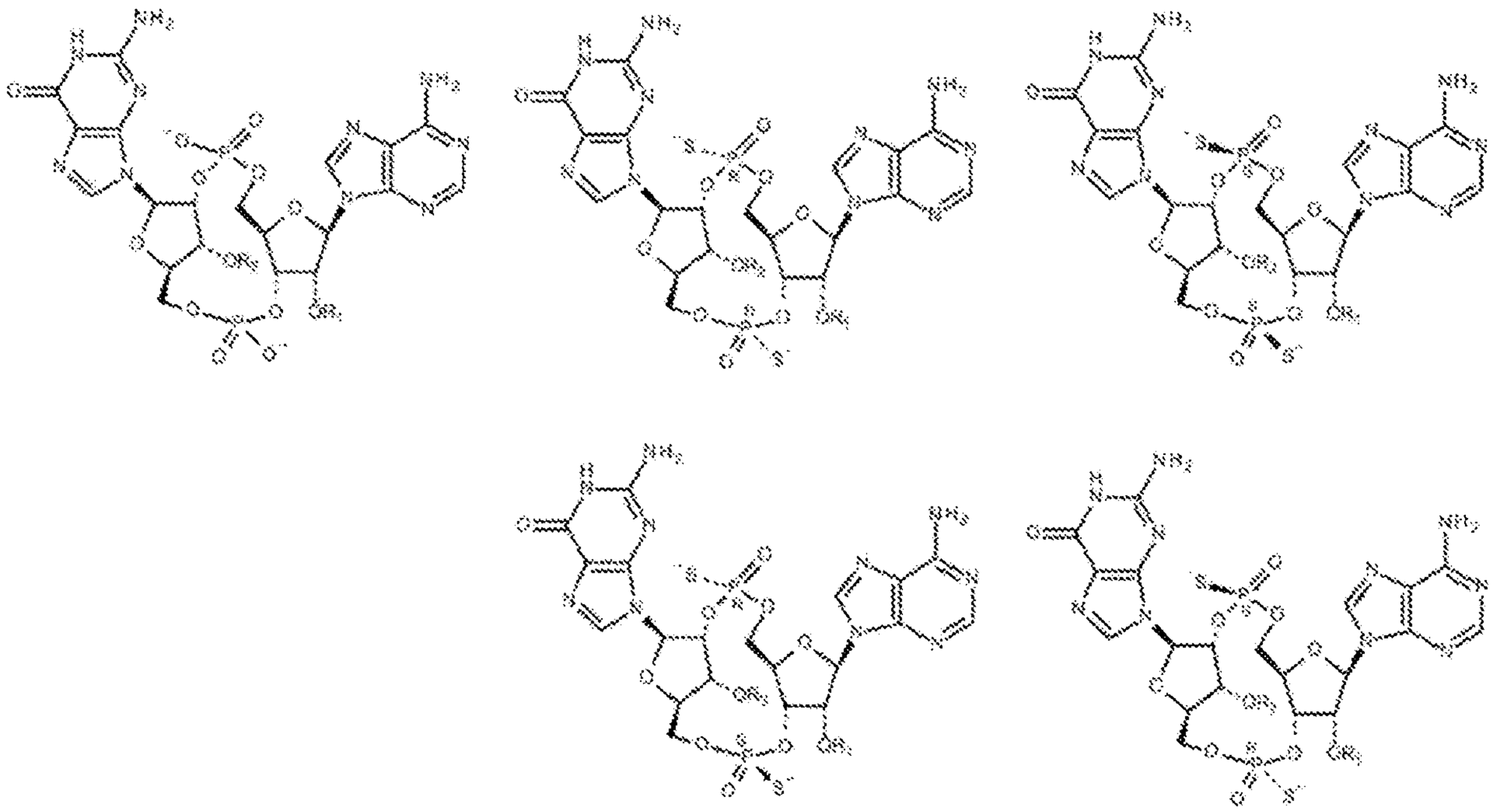
, wherein R_1=R_2=H; R_1=propargyl, R_2=H; R_1=H, R_2=propargyl; R_1=allyl, R_2=H; R_1=H, R_2=allyl; R_1=methyl, R_2=H; R_1=H, R_2=methyl; R_1=ethyl, R_2=H; R_1=H, R_2=ethyl; R_1=propyl, R_2=H; R_1=H, R_2=propyl; R_1=benzyl, R_2=H; R_1=H, R_2=benzyl; R_1=myristoyl, R_2=H; R_1=H, R_2=myristoyl; R_1=R_2=heptanoyl; R_1=R_2=hexanoyl; or R_1=R_2=pentanoyl;



,

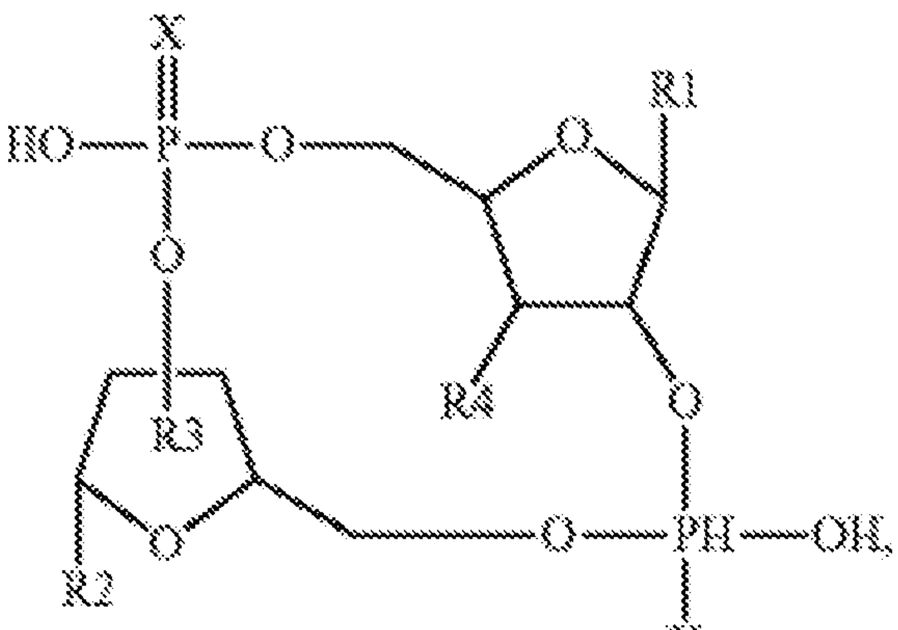
[0320] wherein R_1=R_2=H; R_1=propargyl, R_2=H; R_1=H, R_2=propargyl; R_1=allyl, R_2=H; R_1=H, R_2=allyl; R_1=methyl, R_2=H; R_1=H, R_2=methyl; R_1=ethyl, R_2=H; R_1=H, R_2=ethyl; R_1=propyl,

R_2=H; R_1=H, R_2=propyl; R_1=benzyl, R_2=H; R_1=H, R_2=benzyl; R_1=myristoyl, R_2=H; R_1=H, R_2=myristoyl; R_1=R_2=heptanoyl; R_1=R_2=hexanoyl; or R_1=R_2=pentanoyl;



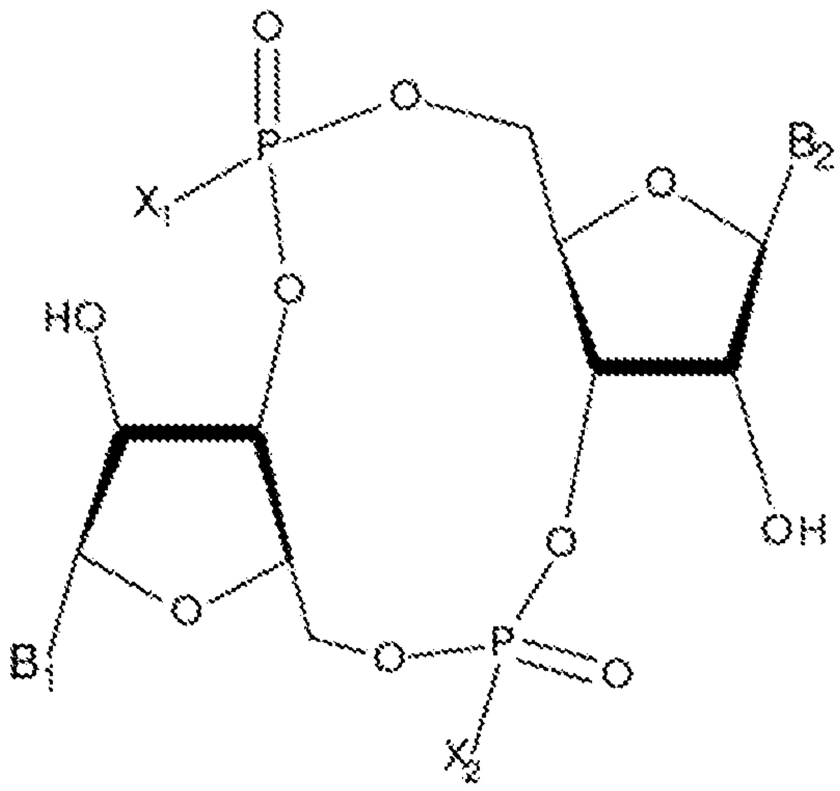
,

[0321] wherein R_1=R_2=H; R_1=propargyl, R_2=H; R_1=H, R_2=propargyl; R_1=allyl, R_2=H; R_1=H, R_2=allyl; R_1=methyl, R_2=H; R_1=H, R_2=methyl; R_1=ethyl, R_2=H; R_1=H, R_2=ethyl; R_1=propyl, R_2=H; R_1=H, R_2=propyl; R_1=benzyl, R_2=H; R_1=H, R_2=benzyl; R_1=myristoyl, R_2=H; R_1=H, R_2=myristoyl; R_1=R_2=heptanoyl; R_1=R_2=hexanoyl; or R_1=R_2=pentanoyl;

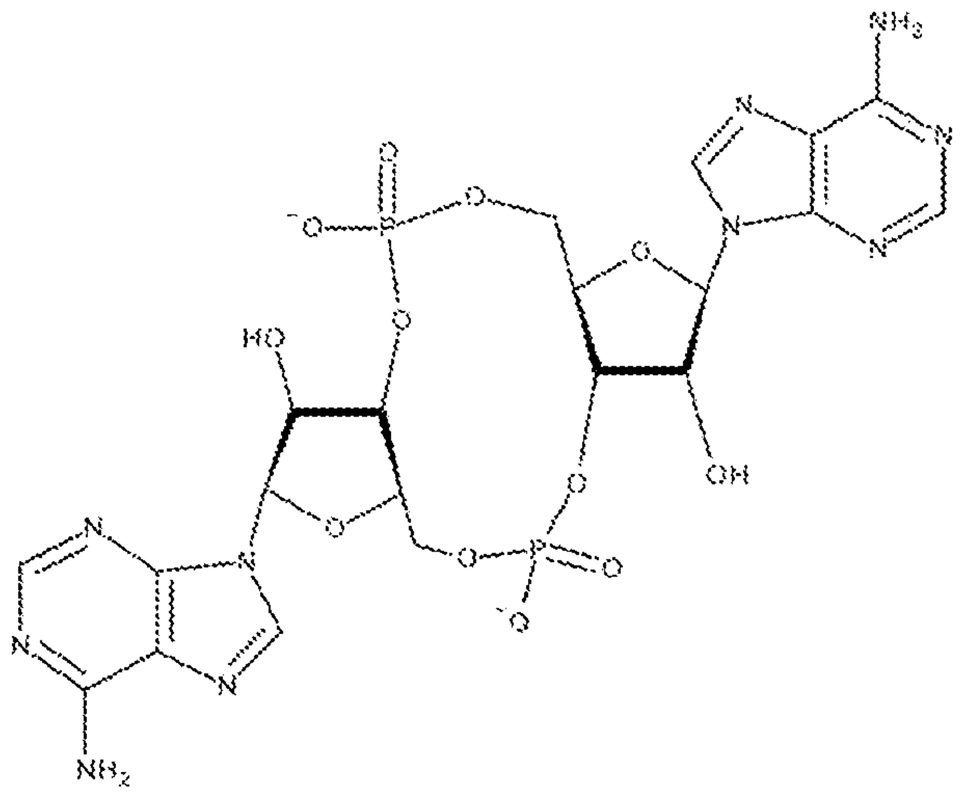


, wherein each X is independently O or S, and R3 and R4 are each independently H or an optionally substituted straight chain alkyl of from 1 to 18 carbons and from 0 to 3 heteroatoms, an optionally substituted alkenyl of from 1-9 carbons, an optionally substituted alkynyl of from 1-9 carbons, or an optionally substituted aryl, wherein substitution(s), when present, may be independently selected from the group consisting of C_{1-6} alkyl straight or branched chain, benzyl, halogen, trihalomethyl, C_{1-6} alkoxy, —NO_2, —NH_2, —

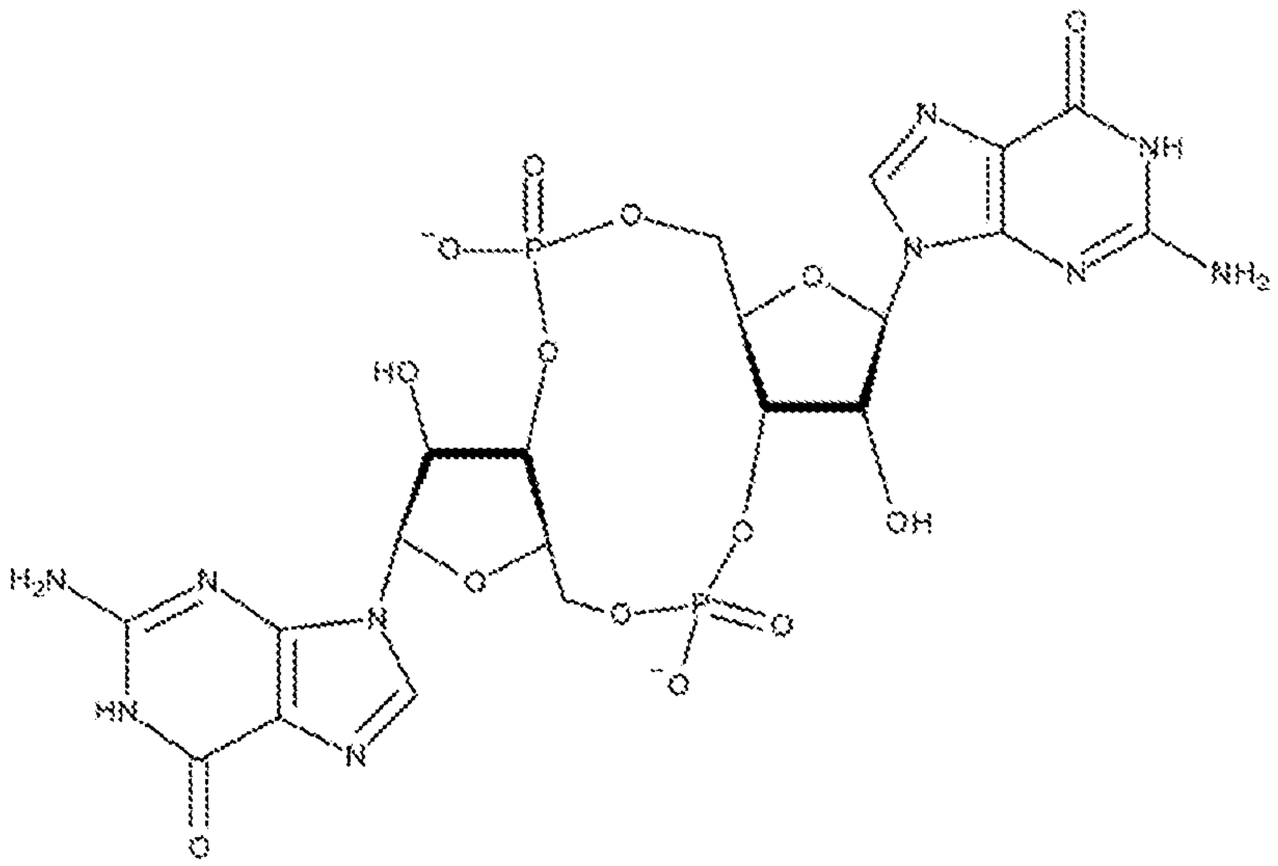
OH, ═O, —COOR´ where R´ is H or lower alkyl, —CH_2OH, and —$CONH_2$, wherein R3 and R4 are not both H;



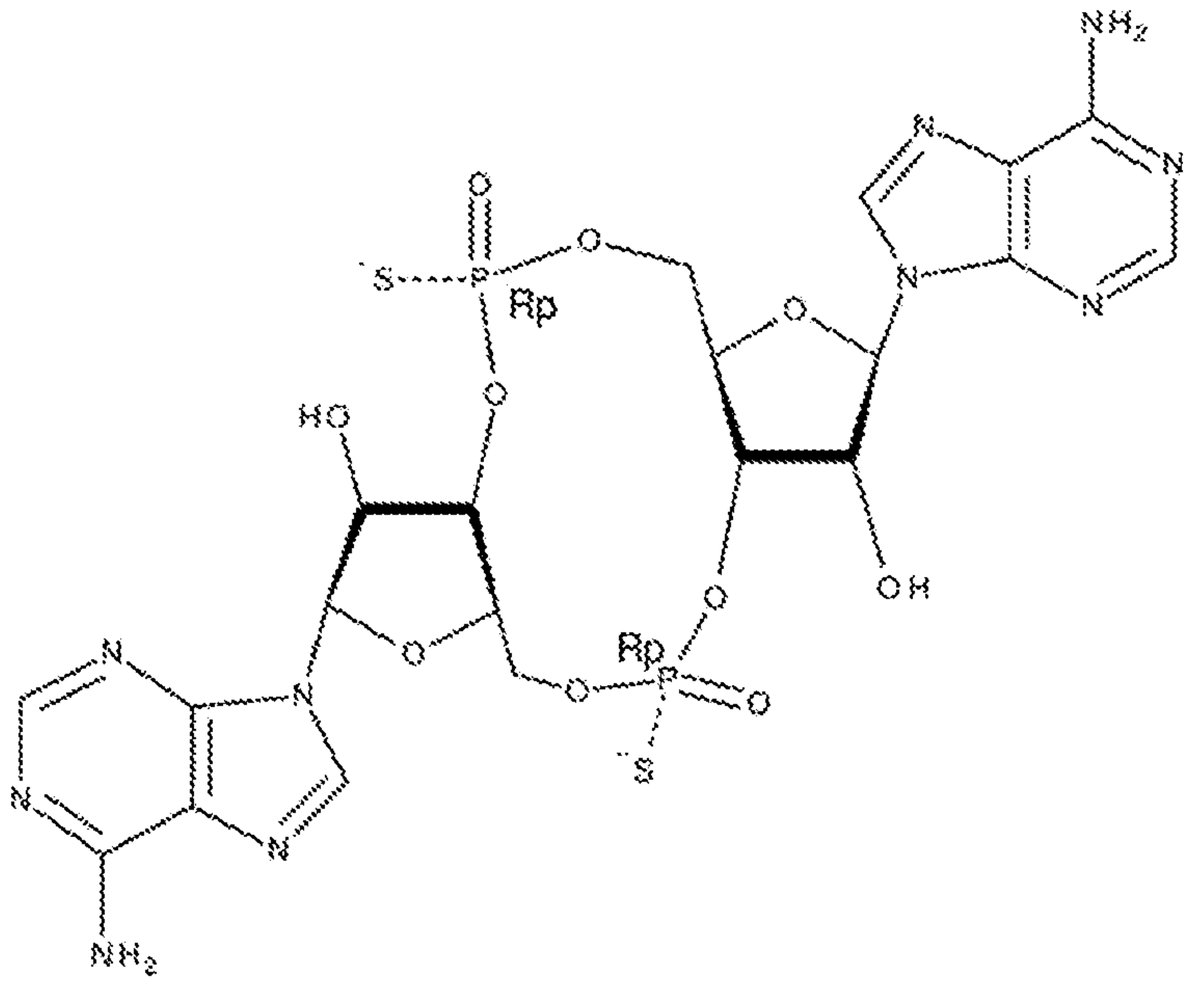
, wherein X_1=X_2=O; X_1=X_2=S; or X_1=O and X_2=S,



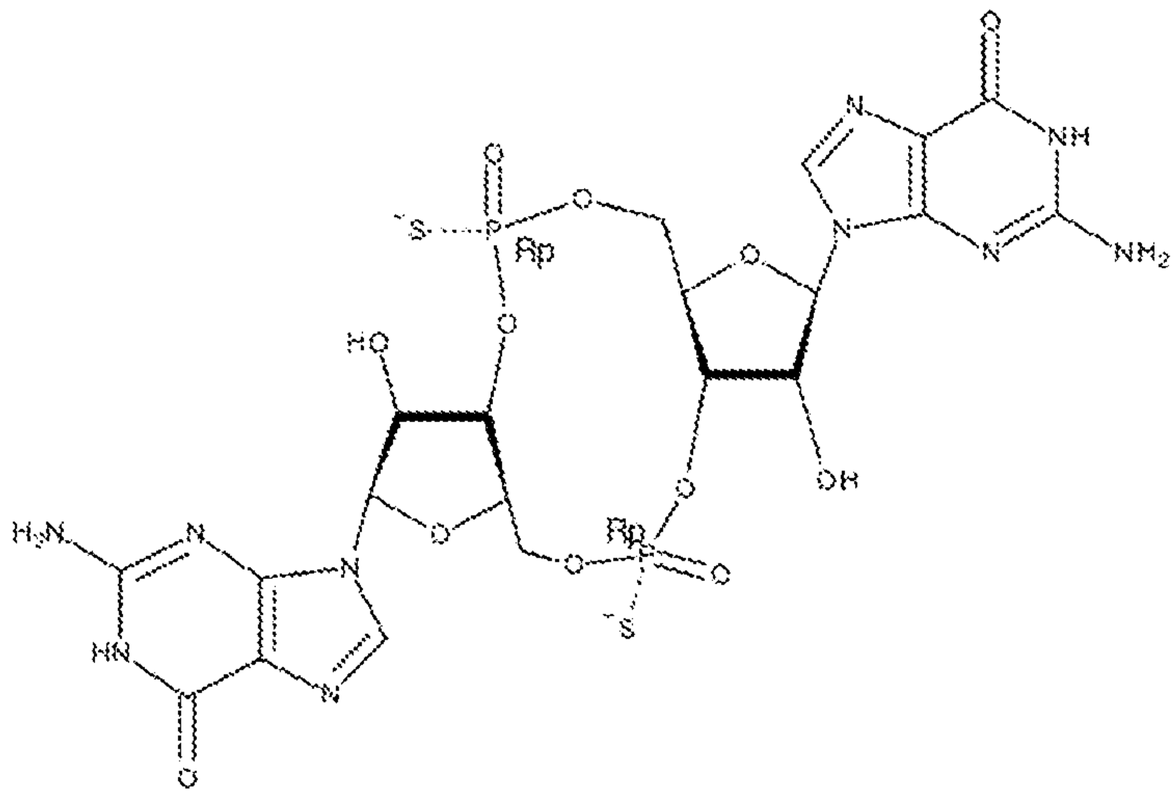
,



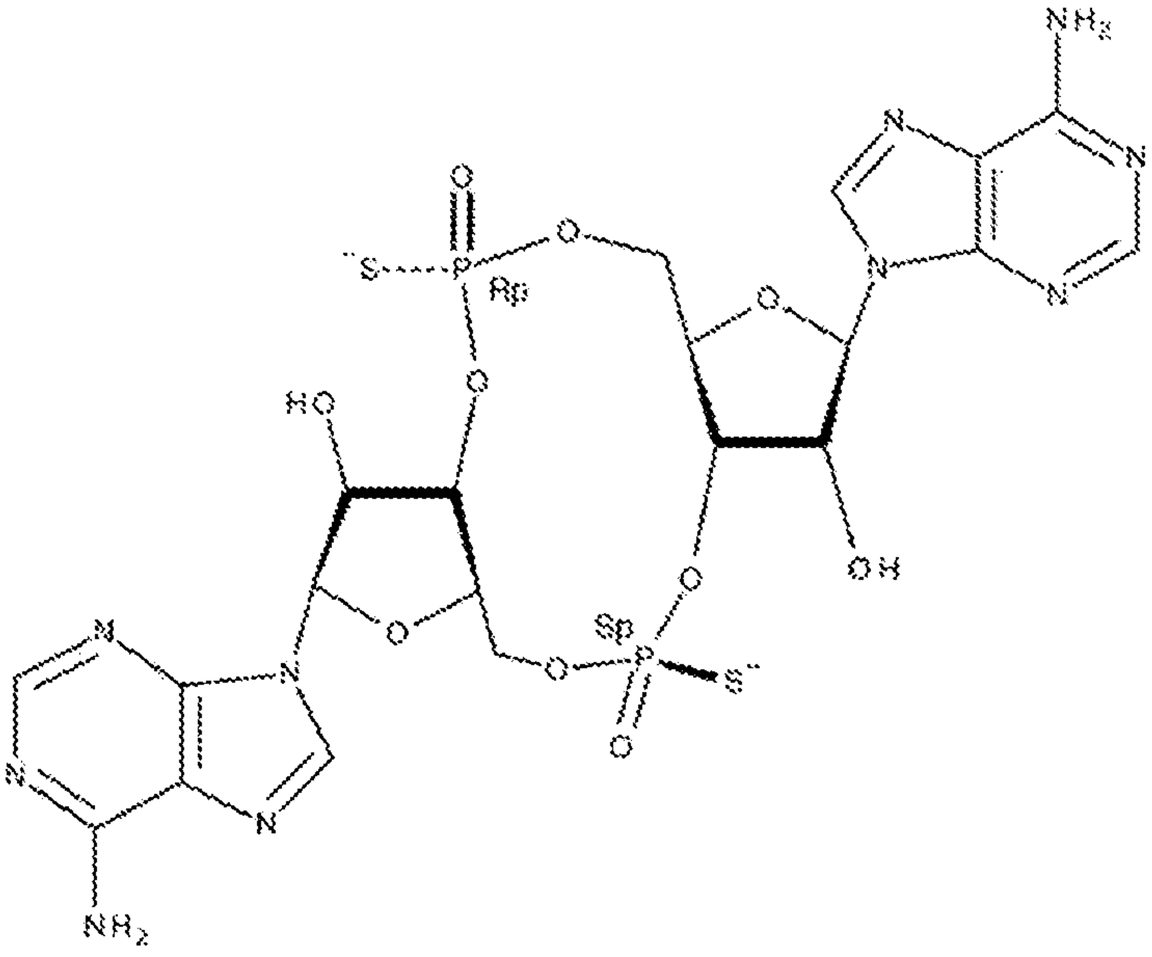
,



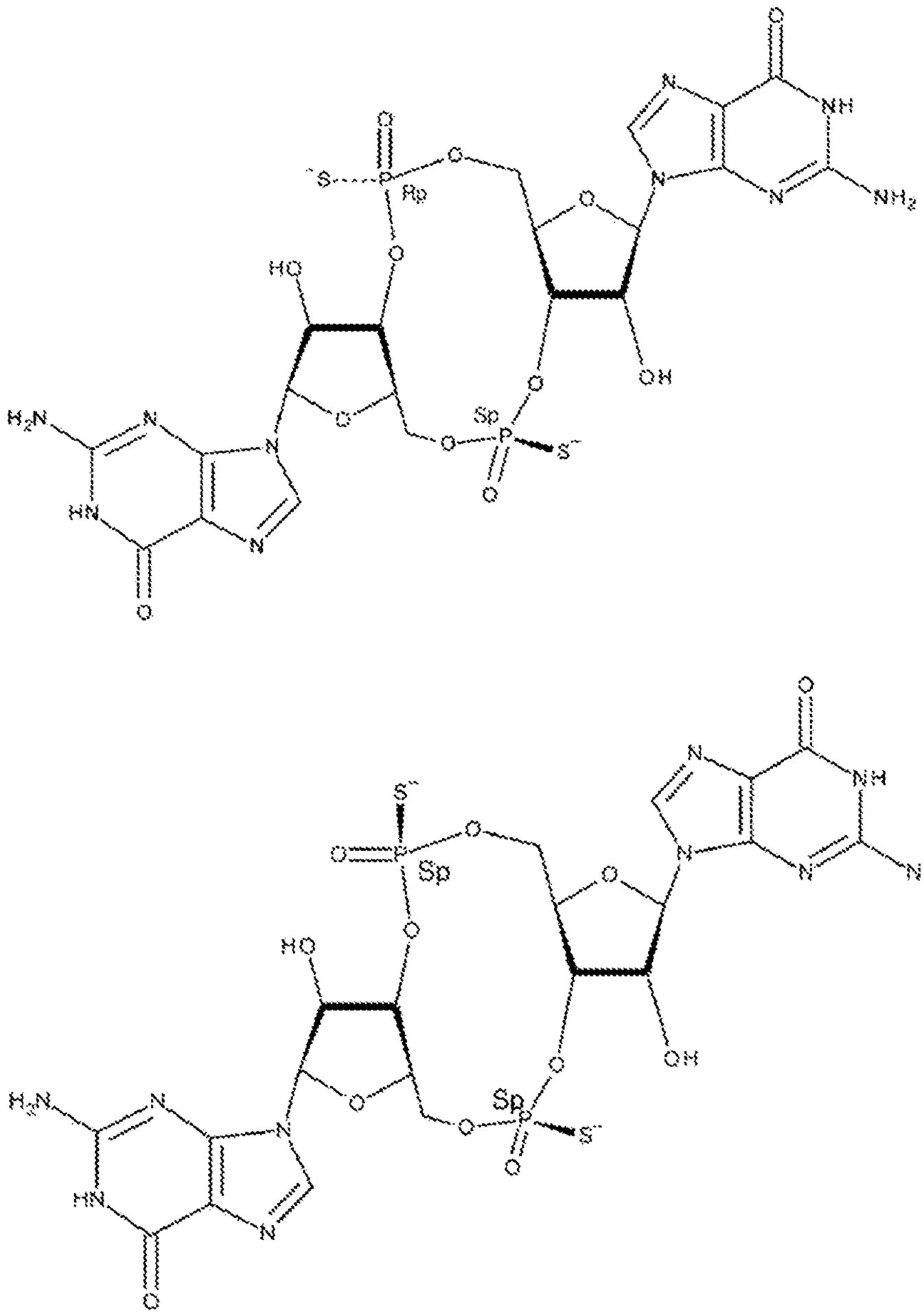
,



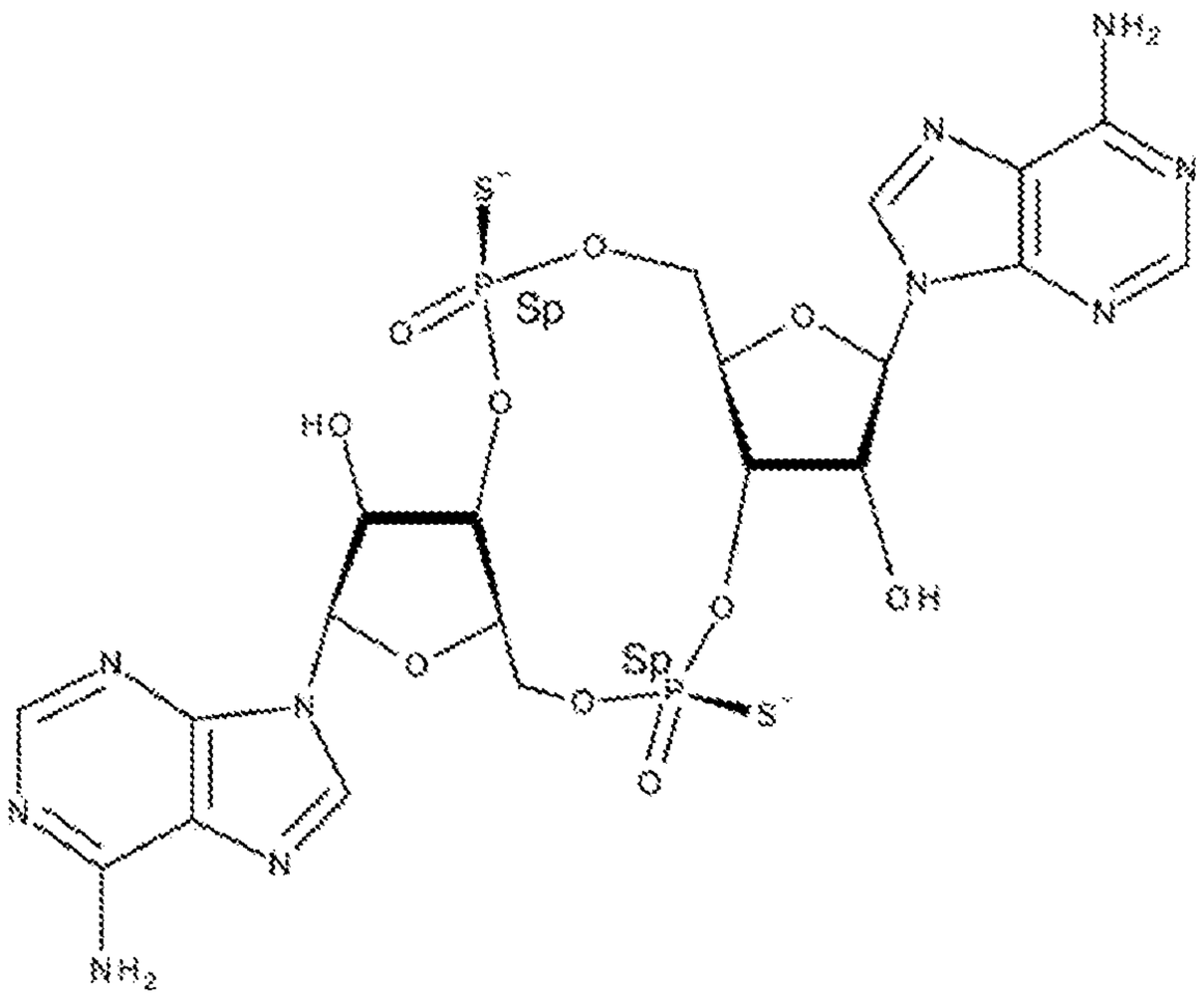
,



,



,



, and



.

[0322] In some embodiments, an immune-stimulatory compound can be a kinase inhibitor. An immune-stimulatory compound can inhibit one or more kinases.

[0323] An immune-stimulatory compound can be an inhibitor of ALK, Bcr-Abl, BRAF, BTK, c-KIT, EGFR, ErbB2, JAK, MEK, MET, PDGFRB, RET, ROS1, Syk, SRC, TGFβR2, TNIK, TNKS, TNKS2, TrkA, TrkB, TrkC, VEGFR1, VEGFR2, VEGFR3, FGFR1, FGFR2, FGFR3, FGFR4, CSF1R, RON/MST1R, TYRO3, MERTK, AXL, PI3Kδ, PI3Kγ, MAP4K1, PERK, KIT, or any combination thereof. An immune-stimulatory compound can be an inhibitor of TGFβR1, TGFβR2, TNIK, TNKS, PI3K-β, STAT3, IL-10, IDO, or TDO.

[0324] In various embodiments, the immune-stimulatory compound comprises LY2109761, GSK263771, iCRT3, iCRT5, iCRT14, LY2090314, CGX-1321, PRI-724, BC21, ZINCO2092166, LGK974, IWP2, LY3022859, LY364947, SB431542, AZD8186, SD-208, indoximod (NLG8189), F001287, GDC-0919, epacadostat (INCB024360), RG70099, 1-methyl-L-tryptophan, methylthiohydantoin tryptophan, brassinin, annulin B, exiguamine A, PIM, LM10, INCB023843, or 8-substituted imidazo[1,5-a]pyridine.

[0325] An immune-stimulatory compound can be an agonist of a GPCR, an ion channel, a membrane transporter, or an ER protein.

[0326] An immune-stimulatory compound can be an antagonist of the GPCR A2aR, the sphingosine 1-phosphate receptor 1, prostaglandin receptor EP3, prostanglandin receptor E2, Frizzled, CXCR4, or an LPA receptor.

[0327] An immune-stimulatory compound can be an ion channel agonist for CRAC, Kv1.3, or KCa3.1.

[0328] An immune-stimulatory compound can be an inhibitor of HSP90 or AAA-ATPase p97.

Immune-Stimulatory Conjugate Properties

[0329] In certain embodiments, an immune-stimulatory compound of a conjugate (i.e, attached to an antibody construct either directly or via a linker) has a biological potency no less than at least about 0.33%, about 1%, about 5%, about 10%, about 20%, about 30%, about 40%, about 50%, about 60%, about 70%, about 80%, about 85%, about 90%, about 95%, or about 100% of the potency of the control (free) immune-stimulatory compound (i.e., not attached to an antibody construct).

[0330] The specificity of the antigen-binding domain (of a conjugate) for an antigen can be influenced by the attachment of an immune-stimulatory compound to an antibody construct. In various embodiments, an antigen-binding domain of the conjugate can bind to its antigen with at least about 10%, about 20%, about 30%, about 40%, about 50%, about 60%, about 70%, about

80%, about 85%, about 90%, about 95%, or about 100% of the specificity of the antigen-binding domain for the antigen in the absence of attachment of the immune-stimulatory compound.

[0331] The specificity of the Fc domain (of a conjugate) for an Fc receptor can be influenced by the attachment site of an immune-stimulatory compound (directly or via a linker). In some embodiments, the Fc domain of a conjugate retains the specificity of the unconjugated Fc domain to bind to an Fc receptor. In specific embodiments, the Fc domain of the conjugate can bind to an Fc receptor with at least about 10%, about 20%, about 30%, about 40%, about 50%, about 60%, about 70%, about 80%, about 85%, about 90%, about 95%, or about 100% of the specificity of the Fc domain to the Fc receptor in the absence of attachment of the immune-stimulatory compound.

[0332] In some embodiments, the Fc domain of a conjugate has an altered specificity for an Fc receptor relative to the corresponding unconjugated Fc domain. In specific embodiments, the Fc domain of the conjugate can bind to an Fc receptor with at least about 10%, about 20%, about 30%, about 40%, about 50%, about 60%, about 70%, about 80%, about 85%, about 90%, about 95%, or about 100% loss of specificity of the Fc domain to the Fc receptor as compared to an Fc domain of a conjugate not attached to an immune-stimulatory compound (in the absence of the immune-stimulatory compound). In some embodiments, the Fc domain is an Fc null.

[0333] The affinity of the antigen-binding domain of a conjugate to an antigen can be influenced by the attachment of an immune-stimulatory compound attached to the antibody construct. In some embodiments, the affinity of the antigen-binding domain of the conjugate for binding to an antigen is at least about 1%, about 5%, about 10%, about 20%, about 30%, about 40%, about 50%, about 60%, about 70%, about 80%, about 85%, about 90%, about 95%, or about 100% of the affinity of the antigen-binding domain to the antigen in the absence of the immune-stimulatory compound (not attached to the antibody construct).

[0334] The affinity of the Fc domain to an Fc receptor of a conjugate can be influenced by attachment of an immune-stimulatory compound to the antibody construct (either directly or indirectly). In some embodiments, the Fc domain of the conjugate can bind to an Fc receptor with at least about 1%, about 5%, about 10%, about 20%, about 30%, about 40%, about 50%, about 60%, about 70%, about 80%, about 85%, about 90%, about 95%, or about 100% of the affinity of the Fc domain to the Fc receptor in the absence of the immune-stimulatory compound attached to the antibody construct. In some embodiments, the Fc domain of the conjugate can bind to an Fc receptor with a reduced affinity of at least about 1%, about 5%, about 10%, about 20%, about 30%, about 40%, about 50%, about 60%, about 70%, about 80%, about 85%, about 90%, about 95%, or about 100% of the affinity of the Fc domain to the Fc receptor in the absence of

attachment the immune-stimulatory compound (directly or via a linker). In some embodiments, the Fc domain is an Fc null.

[0335] The K_d for binding of an antigen-binding domain to an antigen when an immune-stimulatory compound is attached to the antibody construct can be about 2 times, about 3 times, about 4 times, about 5 times, about 6 times, about 7 times, about 8 times, about 9 times, about 10 times, about 15 times, about 20 times, about 25 times, about 30 times, about 35 times, about 40 times, about 45 times, about 50 times, about 60 times, about 70 times, about 80 times, about 90 times, about 100 times, about 110 times, or about 120 times greater than the K_d for binding of the antigen binding domain to the antigen in the absence of the immune-stimulatory compound attached to the antibody construct.

[0336] In some embodiments, the K_d for binding of an Fc domain to an Fc receptor when an immune-stimulatory compound is attached to an antibody construct can be about 2 times, about 3 times, about 4 times, about 5 times, about 6 times, about 7 times, about 8 times, about 9 times, about 10 times, about 15 times, about 20 times, about 25 times, about 30 times, about 35 times, about 40 times, about 45 times, about 50 times, about 60 times, about 70 times, about 80 times, about 90 times, about 100 times, about 110 times, or about 120 times greater than the K_d for binding of the Fc domain to the Fc receptor without the immune-stimulatory compound attached to the antibody construct.

[0337] In some embodiments, the K_d for binding of an Fc domain to a Fc receptor when the immune-stimulatory compound is attached to the antibody construct can be about 2 times, about 3 times, about 4 times, about 5 times, about 6 times, about 7 times, about 8 times, about 9 times, about 10 times, about 15 times, about 20 times, about 25 times, about 30 times, about 35 times, about 40 times, about 45 times, about 50 times, about 60 times, about 70 times, about 80 times, about 90 times, about 100 times, about 110 times, or about 120 times less than the K_d for binding of the Fc domain to the Fc receptor when the immune-stimulatory compound is not attached to the antibody construct.

[0338] Affinity is the strength of the sum total of noncovalent interactions between a single binding site of a molecule, for example, an antibody, and the binding partner of the molecule, for example, an antigen. The affinity can also measure the strength of an interaction between an Fc domain of an antibody and an Fc receptor. Unless indicated otherwise, as used herein, "binding affinity" refers to intrinsic binding affinity which reflects a 1:1 interaction between members of a binding pair (e.g., antibody and antigen or Fc domain and Fc receptor). The affinity of a molecule X for its partner Y can generally be represented by the dissociation constant (K_d). Affinity can be measured by common methods known in the art. Specific illustrative and exemplary embodiments for measuring binding affinity are described in the following.

[0339] In some embodiments, an antibody construct (e.g., an antibody or antigen-binding fragment thereof) can have a dissociation constant (K_d) for an antigen or Fc receptor of about 1 μM, about 100 nM, about 10 nM, about 5 nM, about 2 nM, about 1 nM, about 0.5 nM, about 0.1 nM, about 0.05 nM, about 0.01 nM, or about 0.001 nM or less (*e.g.*, 10^{-6} or less, 10^{-8} M or less, from 10^{-8} M to 10^{-13} M, or from 10^{-9} M to 10^{-13} M). An affinity matured antibody can be an antibody with one or more alterations in one or more complementarity determining regions (CDRs), compared to a parent antibody, which may not possess such alterations, such alterations resulting in an improvement in the affinity of the antibody for antigen. These antibodies can bind to their antigen with a K_d of about 5×10^{-9} M, about 2×10^{-9} M, about 1×10^{-9} M, about 5×10^{-10} M, about 1×10^{-10} M, about 5×10^{-11} M, about 1×10^{-11} M, about 5×10^{-12} M, about 1×10^{-12} M, or less. In some embodiments, the antibody construct (e.g., affinity matured antibody) can have an increased affinity of at least 1.5-fold, 2-fold, 2.5-fold, 3-fold, 4-fold, 5-fold, 10-fold, 20-fold, or greater as compared to an antibody construct without alterations in one or more CDRs.

[0340] K_d can be measured by any suitable assay. For example, K_d can be measured by a radiolabeled antigen binding assay (RIA). For example, K_d can be measured using surface plasmon resonance assays (e.g., using a BIACORE®-2000 or a BIACORE®-3000).

[0341] The molar ratio or drug-antibody ratio of a conjugate refers to the number of immune-stimulatory compounds attached to an antibody construct in a conjugate or preparation of immune-stimulatory conjugates. The molar ratio can refer to the number of immune-stimulatory compounds attached (e.g., conjugated) to an antibody construct of a particular conjugate and is an integer, such as from 0-8 or 0 to 20. The molar ratio can also refer to the average number of immune-stimulatory compounds attached to antibody constructs in a mixture of conjugates, such as in a pharmaceutical composition.

[0342] The molar ratio can be determined, for example, by Liquid Chromatography/Mass Spectrometry (LC/MS), in which the number of immune-stimulatory compounds attached to the antibody construct can be directly determined. Additionally, as non-limiting examples, the molar ratio can be determined based on hydrophobic interaction chromatography (HIC) peak area, by liquid chromatography coupled to electrospray ionization mass spectrometry (LC-ESI-MS), by UV/Vis spectroscopy, by reversed-phase-HPLC (RP-HPLC), or by matrix-assisted laser desorption/ionization time of flight mass spectrometry (MALDI-TOF-MS).

[0343] In some embodiments, the molar ratio of immune-stimulatory compound to antibody construct can be less than 8 or less than 20. In other embodiments, the molar ratio of immune-stimulatory compound to an antibody construct can be 8, 7, 6, 5, 4, 3, 2, or 1. In some embodiments, the average molar ratio of immune-stimulatory compounds to antibody constructs in a composition can be less than 8, such as about 3 to 5 or about 2. In other embodiments, the

average molar ratio of immune-stimulatory compounds to antibody constructs in a composition can be 8, 7, 6, 5, 4, 3, 2, or 1 or fractions hereof, or such as about 3.5 or about 1.8.

[0344] In a conjugate, an antibody construct (e.g., an antibody) can be linked to an immune-stimulatory compound in such a way that the antibody construct can still bind to an antigen and the Fc domain of the antibody construct can still bind to an FcR. In a conjugate, an antibody construct can be linked to an immune-stimulatory compound in such a way that the linking does not interfere with the ability of the antigen binding domain of the antibody construct to bind to its antigen, the ability of the Fc domain of the antibody construct to bind to an FcR, or FcR-mediated signaling resulting from the Fc domain of the antibody construct binding to an FcR. In a conjugate, an immune-stimulatory compound can be linked to an antibody construct in such a way that the linking does not interfere with the ability of the immune-stimulatory compound to bind to its receptor or otherwise can induce a biological effect. In some embodiments, a conjugate can produce stronger immune stimulation and a greater therapeutic window than components of the conjugate alone. For example, in an anti-tumor or anti-CD40 antibody linked to a TLR agonist, the combination of CD40 agonism, TLR agonism and an accessible Fc domain of the anti-CD40 antibody resulting in FcR-mediated signaling can produce stronger immune stimulation and a greater therapeutic window than the CD40 agonism, TLR agonism, or the FcR-mediated signaling alone.

[0345] In some embodiments, a conjugate can comprise a first binding domain, wherein the first binding domain contributes to immune-stimulatory activity; a first and second binding domain, wherein the second binding domain contributes to immune stimulatory activity; or a first binding domain and second binding domain, wherein the first binding domain and the second binding domain contribute to immune-stimulatory activity. The first binding domain and the second binding domain can contribute to the same immune-stimulatory activity. The first binding domain and the second binding domain can contribute to different immune-stimulatory activities.

[0346] In some embodiments, a conjugate in which the first binding domain contributes to immune-stimulatory activity can increase the immune-stimulation of the conjugate.

Immune-Stimulatory Compound Potency and Binding Activity

[0347] In certain embodiments, an immune-stimulatory compound has similar activity when bound to the antibody construct as when not bound to the antibody construct. In certain embodiments, the immune-stimulatory compound maintains the same level of potency and/or binding affinity when bound to an antibody construct as compared to the unbound immune-stimulatory compound.

[0348] For many known antibody-drug conjugates, the payload/drug of the conjugate is a cytotoxic agent that acts on an intracellular target. The antibody generally targets a certain tumor marker on the surface of a cancer cell and upon binding of the antibody to the tumor cell, the cancer cell then internalizes the antibody-cytotoxic agent conjugate. The cytotoxic agent is released within the cell through enzymatic cleavage or other cleavage of the agent's linkage to the antibody or through enzymatic degradation of the antibody. The released cytotoxic agent or degredation product acts on the intracellular target of the cytotoxic agent to kill the cancer cell. Important to the mechanism of action of many antibody-cytotoxic agent conjugates is: (1) that the cytotoxic agent is bound to the antibody with a linker, wherein the linker is not cleaved until exposed to enzymes or conditions inside a target cell, e.g., a cancer cell; (2) that the cytotoxic agent is released from the antibody inside of the cell to perform its cytotoxic function; and (3) that the cytotoxic agent is not active or minimally active (i.e., in a prodrug form) when bound to the antibody such that the cytotoxic agent does not indiscriminately kill cells and harm organ systems distributed thorught the body on the path to the cancer cell.

[0349] In certain aspects, the immune-stimulatory conjugates of the disclosure operate under a different paradigm from such antibody-cytotoxic agent conjugates. The immune-stimulatory conjugates of the disclosure can be designed in a way that the payload immune-stimulatory compound has the same potency, similar potency, or increased potency when bound to the antibody construct as compared to the unbound immune-stimulatory compound and in contrast to antibody-cytotoxic agent conjugates. The immune-stimulatory conjugates of the disclosure may perform, and in some cases preferably perform, the intended function of the compound, i.e., stimulate or modulate the function of immune cells or other target cells, without prior release of the compound from the conjugate (i.e., while attached to the antibody construct). The features of the immune-stimulatory compound-conjugates and assays that enable these functions and others are described further herein.

[0350] The potency of the immune-stimulatory compound of the conjugate may not be significantly reduced relative to the potency of the un-attached (free) immune-stimulatory compound. In particular, the potency of the immune-stimulatory compound of the conjugate (i.e., as part of the conjugate or covalently bound to the antibody construct) is preferably no greater than 500-fold less, no greater than 400-fold less, no greater than 300-fold less, no greater than 200-fold less, no greater than 100-fold less, no greater than 50-fold less, or no greater than 10-fold less than the potency of a control compound, wherein the control compound is the unbound immune-stimulatory compound. For example, for an immune-stimulatory conjugate represented by the structure: Ab – L – C, wherein A is an antibody construct, L is a linker, and C is an immune-stimulatory compound, the immune-stimulatory activity of C of the conjugate A – L – C

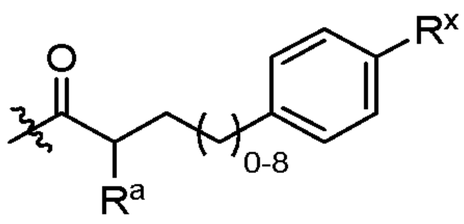
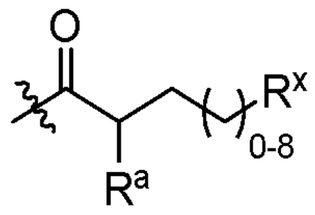
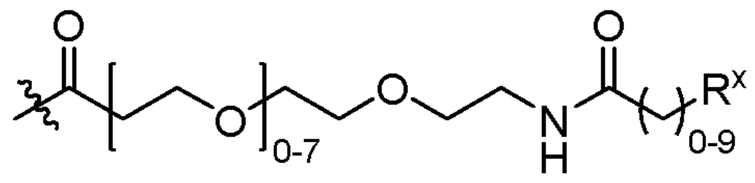
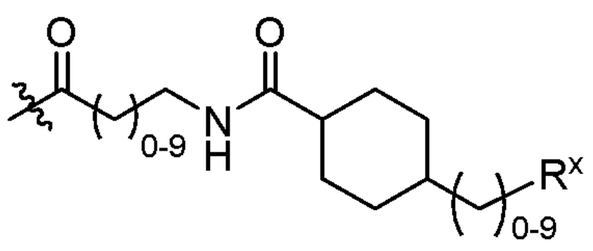
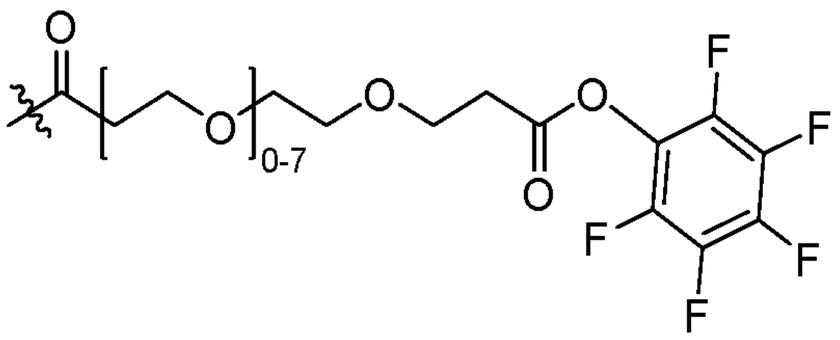
is preferably no greater than 500-fold less, no greater than 400-fold less, no greater than 300-fold less, no greater than 200-fold less, no greater than 100-fold less, no greater than 50-fold less, or no greater than 10-fold less than the potency of the immune-stimulatory compound, C, unbound from the immune-stimulatory conjugate, A – L – C, in the absence of processing of the immune-stimulatory conjugate in a cell.

[0351] In particular embodiments, the potency of an immune-stimulatory compound of the conjugate (i.e., covalently bound to the antibody construct) is near or equivalent to the potency of the unbound immune-stimulatory compound, such as within about 10-fold, within about 8-fold, within about 5-fold, or within about 2-fold of the potency of the unbound immune-stimulatory compound. The potency of the immune-stimulatory compound of the conjugate may be greater than the potency of the unbound immune-stimulatory compound, such as about 2-fold or greater, 5-fold or greater, 10-fold or greater, 100-fold or greater, 200-fold or greater, 300-fold or greater, 400-fold or greater, or even 500-fold or greater than the potency of the unbound immune-stimulatory compound. In certain embodiments, the tolerability of an immune-stimulatory compound when part of a construct is greater than the tolerability of the unbound immune-stimulatory compound in a subject.

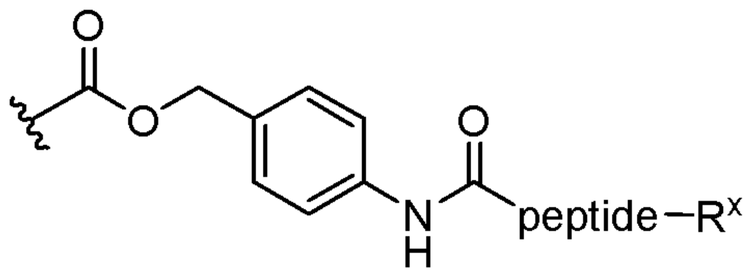
[0352] In certain embodiments, the potency of the immune-stimulatory compound when bound to a 5-500 atom linker is the same, similar, or increased as compared to the potency of the immune-stimulatory compound not bound to the 5-500 atom linker. In certain embodiments, the tolerability of the immune-stimulatory compound in a subject when bound to a 5-500 atom linker is the same, similar, or increased as compared to the tolerability of the immune-stimulatory compound not bound to the 5-500 atom linker.

[0353] The "5-500 atom linker" referred to herein has 5 to 500 consecutive atoms from end to end. When attached to an immune-stimulatory compound and to an antibody construct, a 5-500 atom linker has 5-500 consecutive atoms between the point of attachment to the immune-stimulatory compound and the point of attachment to the antibody construct. A 5-500 atom linker can have, for example, from about 50 to about 500 atoms, such as about 50 to about 300 atoms or such as about 50 to about 200 atoms. A 5-500 atom linker can have, for example, from about 25 to about 500 atoms, such as about 25 to about 300 atoms or such as about 25 to about 200 atoms. In certain embodiments, the linker includes one or more peptide bonds. In certain embodiments, the linker includes one or more ethylene glycol groups. In certain embodiments, the linker includes a peptide backbone and one or more side chains. In certain embodiments, the linker is not cleaved from the immune-stimulatory compound in the assay evaluating potency.

[0354] Exemplary 5-500 atom linkers include Fleximer linkers, linkers with one or more carbamate or amide linkages and linkers represented by the formula:

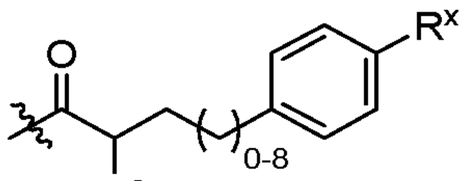
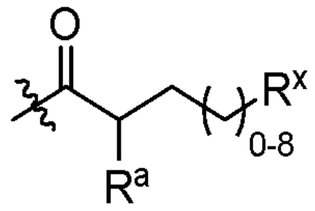
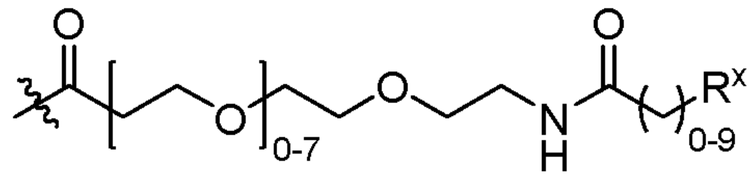
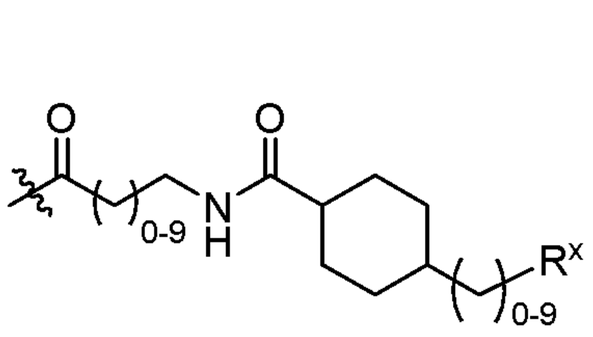
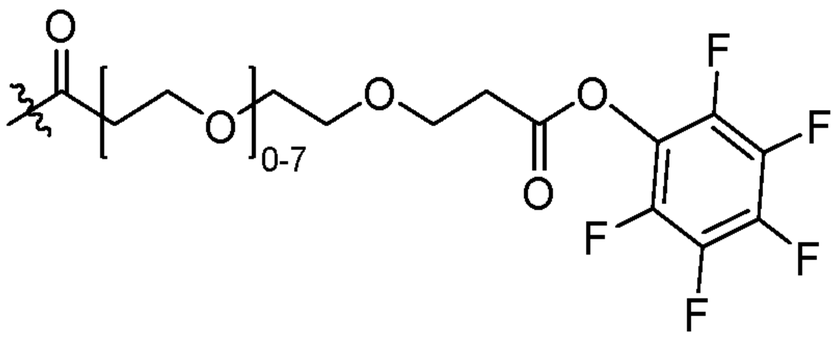






, or



, wherein R^x is a reactive moiety for attachment to the antibody construct, R^a is hydrogen, C_{1-10}alkyl, sulfonate and methyl sulfonate and the wavy line indicates an attachment to the rest of the linker or to the immune-stimulatory compound.

[0355] In some embodiments, the linker is a non-cleavable linker. Examples of non-cleavable linkers include the following:

wherein R^x is a reactive moiety for attachment to the antibody construct, R^a is hydrogen, C_{1-10}alkyl, sulfonate and methyl sulfonate and the wavy line indicates an attachment to the rest of the linker or to the immune-stimulatory compound.

[0356] Further examples of non-cleavable linkers include:

DEMANDE OU BREVET VOLUMINEUX

LA PRÉSENTE PARTIE DE CETTE DEMANDE OU CE BREVET COMPREND PLUS D'UN TOME.

CECI EST LE TOME 1 DE 2
CONTENANT LES PAGES 1 À 207

NOTE : Pour les tomes additionels, veuillez contacter le Bureau canadien des brevets

JUMBO APPLICATIONS/PATENTS

THIS SECTION OF THE APPLICATION/PATENT CONTAINS MORE THAN ONE VOLUME

THIS IS VOLUME 1 OF 2
CONTAINING PAGES 1 TO 207

NOTE: For additional volumes, please contact the Canadian Patent Office

NOM DU FICHIER / FILE NAME :

NOTE POUR LE TOME / VOLUME NOTE:

CLAIMS

WHAT IS CLAIMED IS:

1. An immune-modulatory conjugate comprising:

(a) an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to a first antigen;

(b) a proteolysis targeting module, comprising:

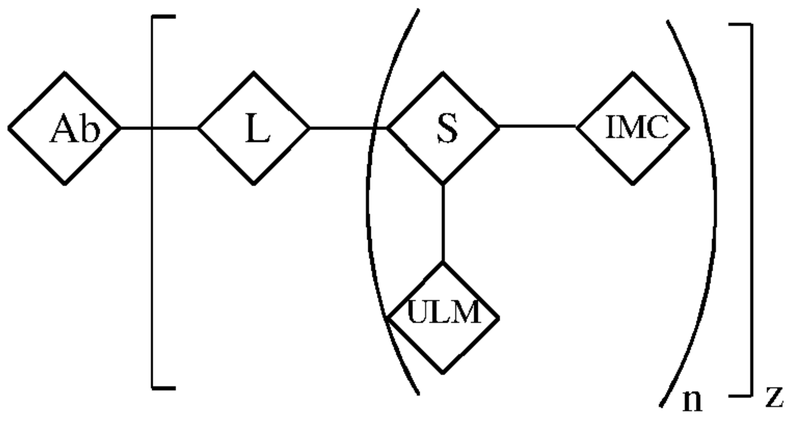
(i) a protein targeting moiety that binds to a target protein;

(ii) an E3 ubiquitin ligase binding moiety; and

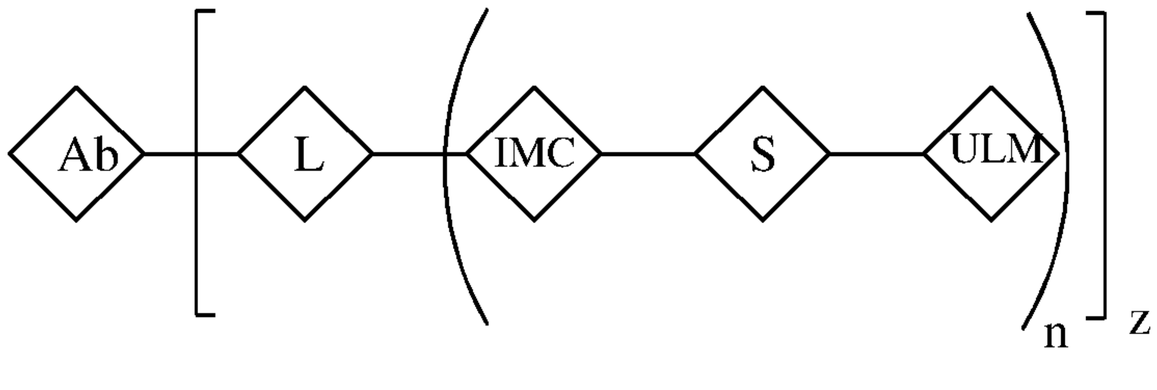
(iii) a spacer S that is covalently bound to the protein targeting moiety and to the E3 ubiquitin ligase binding moiety, wherein the spacer is optionally has 1-25 consecutive non-hydrogen atoms; and

(c) a linker L that is covalently attached to the antibody construct and to the proteolysis targeting module.

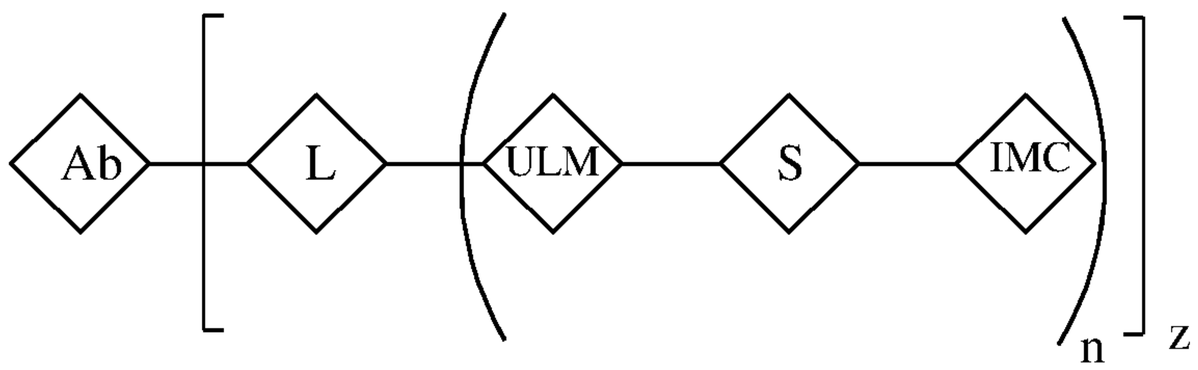
2. The conjugate of claim 1, wherein the conjugate is represented by one of the following formulae:



(VII),



(VIII), or



(IX)

wherein:

Ab is the antibody construct;

L is the linker;

ULM is the E3 ubiquitin ligase binding moiety;

IMC is the protein targeting moiety and comprises an immune-modulatory compound;

S is the spacer;

n is selected from 1 to 20; and

z is selected from 1 to 20.

3. The conjugate of any one of claims 1 to 2, wherein the Fc domain is an Fc null.

4. The conjugate of any one of claims 1 to 3, wherein the E3 ubiquitin ligase is selected from the group consisting of E3 ubiquitin ligase, such as Von Hippel-Lindaue E3 ubiquitin ligase (VHL), cereblon, mouse double minute 2 homolog (MDM2), AMFR, APC/Cdc20, APC/Cdh1, C6orf157, Cbl, CBLL1, CHFR, CHIP, DTL (Cdt2), E6-AP, HACE1, HECTD1, HECTD2, HECTD3, HECW1, HECW2, HERC2, HERC3, HERC4, HERC5, HUWE1, HYD, ITCH, LNX1, mahogunin, MARCH-I, MARCH-II, MARCH-III, MARCH-IV, MARCH-VI, MARCH-VII, MARCH-VIII, MARCH-X, MEKK1, MIB1, MIB2, MycBP2, NEDD4, NEDD4L, Parkin, PELI1, Pirh2, PJA1, PJA2, RFFL, RFWD2, Rictor, RNF5, RNF8, RNF19, RNF190, RNF20, RNF34, RNF40, RNF125, RNF128, RNF138, RNF168, SCF/β-TrCP, SCF/FBW7, SCF/Skp2, SHPRH, SIAH1, SIAH2, SMURF1, SMURF2, TOPORS, TRAF6, TRAF7, TRIM63, UBE3B, UBE3C, UBR1, UBR2, UHRF2, WWP1, WWP2, and ZNRF1.

5. The conjugate of claim 4, wherein the E3 ubiquitin ligase binding moiety binds to VHL, cereblon, or MDM2.

6. The conjugate of any one of claims 1 to 5, wherein the protein targeting moiety binds to a protein selected from one of the groups consisting of:

a) an aryl hydrocarbon receptor, androgen receptor, estrogen receptor, FK506-binding protein 12, fibroblast growth factor receptor substrate 2, phosphatidylinositol -4,5-biphosphate 3-kinase, SMAD family member 3, bromodomain and extra-territorial family of proteins (BET), bromodomain-containing protein 4 member of the BET family, Abelson tyrosine kinase, receptor-interacting serine/threonine-protein kinase 1, estrogen-related receptor, and transforming growth factor beta (TGFβ); or

b) ALK, Bcr-Abl, BRAF, BTK, c-KIT, EGFR, ErbB2, JAK, MEK, MET, PDGFRB, RET, ROS1, Syk, SRC, TNIK, TNKS, TNKS2, TrkA, TrkB, TrkC, VEGFR1, VEGFR2, VEGFR3, FGFR1, FGFR2, FGFR3, FGFR4, CSF1R, RON/MST1R, TYRO3, MERTK, AXL, PI3K, PI3K, MAP4K1, PERK, and KIT; or

c) TGFβR2, TGFβR1, SMAD2, SMAD3, SMAD4, beta-catenin, CREBB2, Beta catenin/TCF4, beta catenin/LEF, beta catenin/CREBBP, YAP, TAZ, YAP/TAZ, TNKS1, TNKS2, MST1, MST2, NRAS, HRAS, KRAS, RASmut12, RASmut13, PERK (EIF2AK3), RON/MST1R, STAT3, MCT1, MCT2, and MCT4; or

d) CSFR1, RON/MST1, PI3Kd, PI3Kg, PARP1, PD-L1, PP2A, A2ar, TYRO3, AXL, and MER.

7. The conjugate of any one of claims 1 to 6, wherein the first antigen is a tumor antigen.

8. The conjugate of claim 7, wherein the first antigen is selected from the group consisting of MUC16, CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC, HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6, HPV E7, EGFRvIII, Her-2/neu, MAGE A3, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyronsinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint fusion protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, Page4, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, MUC15, CA6, NAPI2B, TROP2, CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, LIV1, ROR1, and Fos-related antigen 1.

9. The conjugate of any one of claims 1 to 6, wherein the first antigen is an immune cell antigen.

10. The conjugate of claim 9, wherein the immune cell antigen is an antigen present on the surface of an antigen presenting cell selected from a dendritic cell and a macrophage.

11. The conjugate of any one of claims 9 to 10, wherein the immune cell antigen is selected from the group consisting of CD40, DEC-205, CD36 mannose scavenger receptor 1, CLEC9A, DC-SIGN, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, and CD32B.

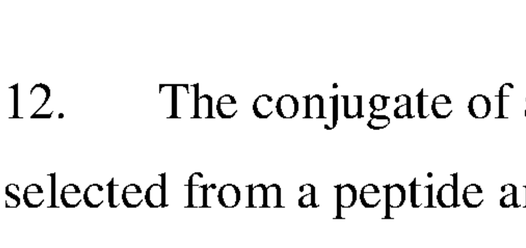
12. The conjugate of any one of claims 1 to 10, wherein the protein targeting moiety is selected from a peptide and a non-proteinaceous molecule.

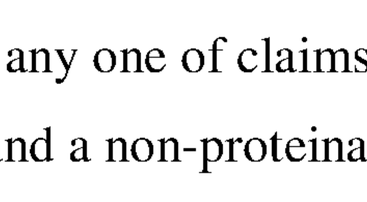
13. The conjugate of any one of claims 1 to 12, wherein the proteolysis targeting module is selected from compounds 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, and 2-1.

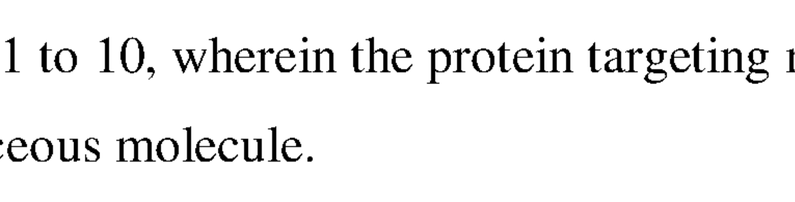
14. The conjugate of any one of claims 1 to 13, wherein L is a cleavable linker.

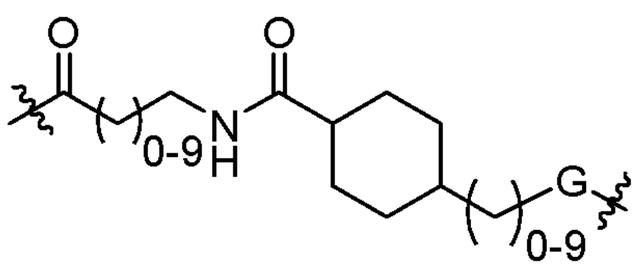
15. The conjugate of any one of claims 1 to 13, wherein L is a non-cleavable linker.

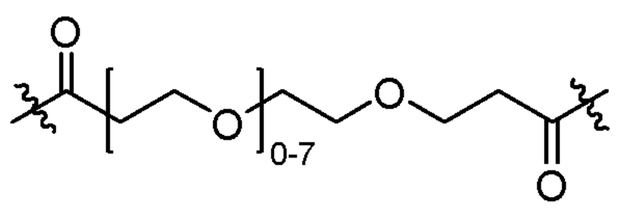
16. The conjugate of any one of claims 1 to 15, wherein L is selected from:

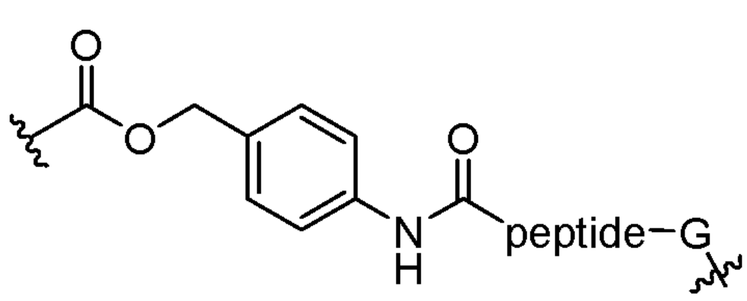


,


,


,


,


, or


, wherein G is an antibody construct linking moiety, G-wavy line indicates a bond of G to the antibody construct, peptide is selected from 1 to 10 amino acids, R^a is selected from hydrogen, C_{1-10}alkyl, sulfonate and methyl sulfonate, and the wavy line at the left side indicates a bond to the remainder of the linker.

17. The conjugate of claim 16, wherein G comprises a succinimide or a hydrolyzed succinimide.

18. The conjugate of any one of claims 1 to 17, wherein L is covalently bound to the antibody construct at a cysteine residue, an engineered cysteine residue, a lysine residue, a glutamate residue, or a glutamine residue of the antibody construct or is covalently bound to the antibody construct using a Sortase linker.

19. The conjugate of any one of claims 1 to 18, wherein the spacer S is an optionally substituted C_{1-25} alkylene or optionally substituted C_{1-25} heteroalkylene, wherein the heteroalkylene is a C_{1-24} alkylene chain interspersed with one or more groups independently selected from: -O-, -S-, -NH_2-, and -C(O)NH-; and optionally substituted with a reactive group, RX, that can form a functional group selected from an amide bond, an ester bond, an ether bond, a carbonate bond, a carbamate bond, or a thioether bond.

20. The conjugate of any one of claims 1 to 19, wherein the antibody construct further comprises a second binding domain.

21. The conjugate of claim 20, wherein the second binding domain specifically binds to an antigen on an immune cell.

22. The conjugate of claim 21, wherein the immune cell antigen is selected from the group consisting of CD40, PD-1, PD-L1, DEC-205, CD36 mannose scavenger receptor 1, CLEC9A, DC-SIGN, CLEC12A, BDCA-2, OX40L, 41BBL, CD204, MARCO, CLEC5A, Dectin 1, Dectin 2, CLEC10A, CD206, CD64, CD32A, CD16A, HVEM, and CD32B.

23. The conjugate of any one of claims 20 to 22, wherein the second binding domain is attached to the antibody construct at a C-terminal end of the Fc domain.

24. The conjugate of any one of claims 11 to 23, wherein the Fc domain is an Fc domain variant comprising at least one amino acid residue change as compared to a wild type sequence of the Fc domain.

25. The conjugate of claim 24, wherein the Fc domain is an Fc domain variant that decreases binding of the Fc domain to an Fc receptor.

26. The conjugate of claim 24, wherein the at least one amino acid residue change is:

a) F243L, R292P, Y300L, L235V, and P396L, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898;

b) S239D and I332E, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898; or

c) S298A, E333A, and K334A, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898.

27. The conjugate of claim 24, wherein the at least one amino acid residue change is:

a) N297A, N297G, N297Q, N297D as in Eu index of Kabat numbering and relative to SEQ ID NO: 898; or

b) K322A/L234A/L235A N296A as in the EU index of Kabat numbering and relative to SEQ ID NO: 898; or

c) L234F/L235E/P331S N296A as in the EU index of Kabat numbering and relative to SEQ ID NO: 898; or

d) P329G/L234A/L235A as in the EU index of Kabat numbering and relative to SEQ ID NO: 898.

28. A pharmaceutical composition, comprising the conjugate of any one of claims 1 to 27 and a pharmaceutically acceptable excipient.

29. The pharmaceutical composition of claim 28, wherein the average ratio of proteolysis targeting modules to antibody construct in the conjugate is from 2 to 6, from 3 to 5, or 1 to 3.

30. The pharmaceutical composition of one of claims 28 to 29, which is lyophilized.

31. A method of treating cancer, comprising administering the conjugate of any one of claims 1 to 27 or the pharmaceutical composition of any one of claims 28 to 30 to a subject in need thereof.

32. The method of claim 31, wherein the cancer is a solid tumor.

33. The method of claim 32, wherein the solid tumor is breast cancer, pancreatic cancer, colorectal cancer, renal cell cancer, gastric cancer, or lung cancer.

34. The method of any one of claims 31 to 33, wherein the pharmaceutical composition is administered parenterally.

35. The method of any one of claims 31 to 33, wherein the pharmaceutical composition is administered intravenously.

36. The use of the conjugate of any one of claims 1 to 27 in the preparation of a medicament for the treatment of cancer.

37. An immune-stimulatory conjugate comprising:

a) an immune-modulatory compound that binds to a protein active site of an intracellular protein target to stimulate an immune response by degradation of the protein target;

b) an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to a first antigen expressed on cells having the intracellular protein target; and

c) a linker, wherein the linker is covalently bound to the antibody construct and the linker is covalently bound to the immune-modulatory compound; wherein the linker is optionally a linker having 5-100 consecutive atoms; wherein the K_d for binding of the immune-modulatory compound, attached to the antibody construct of the conjugate, to the protein active site is equal to, or up to no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the IC50 of the immune-modulatory compound, attached to the antibody construct of the conjugate, is no greater than 300-fold the IC50 of a control compound, wherein the control compound is the unbound immune-modulatory compound.

38. The immune-stimulatory conjugate of claim 37, wherein the Fc domain is an Fc null.

39. The immune-stimulatory conjugate of claim 37, wherein the Fc domain binds to an Fc receptor and the dissociation constant (K_d) for binding of the Fc domain of the conjugate to the Fc receptor is equal to, or up to no greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct.

40. The immune-stimulatory conjugate of any one of claims 37 to 39, wherein the EC50 or IC50 of the immune-modulatory compound attached to the antibody construct of the conjugate is no greater than 10-fold the EC50 or IC50 of a control compound, wherein the control compound is the unbound immune-modulatory compound.

41. The immune-stimulatory conjugate of any one of claims 37 to 40, wherein the EC50 or IC50 of the immune-modulatory compound attached to the antibody construct of the conjugate is equivalent to or less than the EC50 or IC50 of a control compound, wherein the control compound is the unbound immune-modulatory compound.

42. The immune-stimulatory conjugate of any one of claims 37 to 41, wherein the conjugate further comprises an E3 ubiquitin ligase binding moiety.

43. The immune-stimulatory conjugate of claim 42, wherein the E3 ubiquitin ligase binding moiety binds to VHL, cereblon or MDM2

44. The immune-stimulatory conjugate of any one of claims 42 to 43, wherein the E3 ubiquitin ligase binding moiety is selected from compounds 1-1, 1-2, 1-3, 1-4, 1-5, 1-6, and 2-1.

45. The immune-stimulatory conjugate of any one of claims 42 to 44, wherein the E3 ubiquitin ligase binding moiety is attached to the immune-modulatory compound through a spacer, optionally a 1-25 atom spacer, and the spacer is bound through the 5-100 atom linker to the antibody construct.

46. The immune-stimulatory conjugate of any one of claims 37 to 45, wherein the immune-modulatory compound is a kinase inhibitor and the protein active site is a kinase active site.

47. The immune-stimulatory conjugate of claim 46, wherein the linker is covalently bound to the kinase inhibitor at a position on the kinase inhibitor that is at or near the solvent interface of the kinase active site as determined by modeling of the kinase inhibitor in the kinase active site.

48. The immune-stimulatory conjugate of claim 46, wherein the linker is covalently bound to the kinase inhibitor at a position on the kinase inhibitor such that when the kinase inhibitor is bound to the active site, the linker extends out from the kinase active site into the solvent, as determined by modeling of the kinase inhibitor in the kinase active site.

49. The immune-stimulatory conjugate of any one of claims 46 to 48, wherein the kinase inhibitor is selected from an inhibitor of ALK, Bcr-Abl, BRAF, BTK, c-KIT, EGFR, ErbB2, JAK, MEK, MET, PDGFRB, RET, ROS1, Syk, SRC, TGFβR2, TNIK, TNKS, TNKS2, TrkA, TrkB, TrkC, VEGF, VEGFR1, VEGFR2, VEGFR3, FGFR1, FGFR2, FGFR3, FGFR4, CSF1R, RON/MST1R, TYRO3, MERTK, AXL, PI3Kδ, PI3Kγ, MAP4K1, PERK, and combinations thereof.

50. The immune-stimulatory conjugate of any one of claims 37 to 45, wherein the linker is covalently bound to the immune-modulatory compound at a site on the compound that does not interfere with binding of the compound to the protein active site.

51. An immune-stimulatory conjugate comprising:

(a) an immune-stimulatory compound that binds to a protein active site of a protein to stimulate an immune response, wherein the protein is present on the extracellular membrane or in the endoplasmic reticulum of a cell;

(b) an antibody construct comprising an antigen binding domain and an Fc domain, wherein the antigen binding domain binds to a first antigen; and

(c) a linker having 5-100 consecutive atoms, wherein the linker is covalently bound to the antibody construct and the linker is covalently bound to the immune-stimulatory compound; and

wherein the K_d for binding of the immune-stimulatory compound, attached to the antibody construct of the conjugate, to the protein active site is no greater than 100 times the K_d for binding of a control compound to the protein active site or wherein the EC50 or IC50 of the immune-stimulatory compound, attached to the antibody construct of the conjugate, is no greater than 300-fold the EC50 or IC50 of a control compound, wherein the control compound is the unbound immune-stimulatory compound.

52. The immune-stimulatory conjugate of claim 51, wherein the Fc domain is an Fc null.

53. The immune-stimulatory conjugate of claim 51, wherein the Fc domain binds to an Fc receptor and the dissociation constant (K_d) for binding of the Fc domain of the conjugate to an Fc receptor is equal to, or up to no greater than about 100 times the K_d for binding of a control antibody construct to the Fc receptor, wherein the control antibody construct is the unconjugated antibody construct.

54. The immune-stimulatory conjugate of any one of claims 51 to 53, wherein the EC50 or IC50 of the immune-stimulatory compound, when bound to the antibody construct by the 5-100 atom linker, is no greater than 10-fold the EC50 or IC50 of a control compound, wherein the control compound is the unbound immune-stimulatory compound.

55. The immune-stimulatory conjugate of any one of claims 51 to 54, wherein the EC50 or IC50 of the immune-stimulatory compound, when bound to the antibody construct by the 5-100 atom linker, is equivalent to or less than the EC50 or IC50 of a control compound, wherein the control compound is the unbound immune-stimulatory compound.

56. The immune-stimulatory conjugate of any one of claims 51 to 55, wherein the immune-stimulatory compound is a toll-like receptor agonist, STING agonist, or RIG-I agonist.

57. The immune-stimulatory conjugate of claim 56, wherein the immune-stimulatory compound is a toll-like receptor agonist selected from a TLR1 agonist, a TLR2 agonist, a TLR3 agonist, a TLR4 agonist, a TLR5 agonist, a TLR6 agonist, a TLR7 agonist, a TLR8 agonist, a TLR9 agonist, or a TLR10 agonist.

58. The immune-stimulatory conjugate of any one of claims 51 to 57, wherein the immune-stimulatory compound is selected from a pyrimidine, a purine, a guanine nucleoside, an 8-oxoadenine, an imidazoquinoline, a thiazoquinoline, a 2-aminoimidazole, a furo[2,3-c]pyridine, a furo[2,3-c]quinoline, a 2-aminobenzimidazole, a 2-aminoquinoline, and a 2-aminobenzazepine.

59. The immune-stimulatory conjugate of any one of claims 51 to 55, wherein the target of the immune-stimulatory compound is a GCPR, an ion channel, a membrane transporter, a phosphatase or an ER protein.

60. The immune-stimulatory conjugate of any one of claims 51 to 55, wherein the immune-stimulatory compound is an antagonist of the GPCR A2aR, the sphingosine 1-phosphate receptor 1, prostaglandin receptor EP3, prostanglandin receptor E2, Frizzled, CXCR4 or an LPA receptor.

61. The immune-stimulatory conjugate of any one of claims 51 to 55, wherein the immune-stimulatory compound is an ion channel agonist for CRAC, Kv1.3 or KCa3.1.

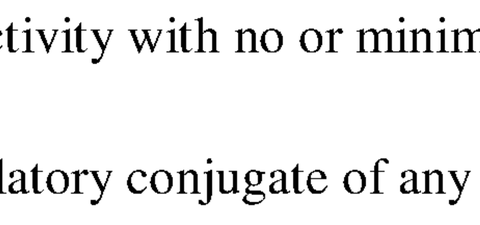
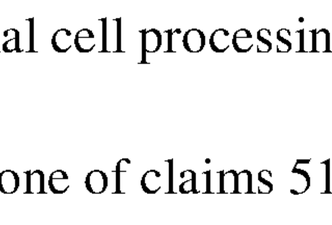
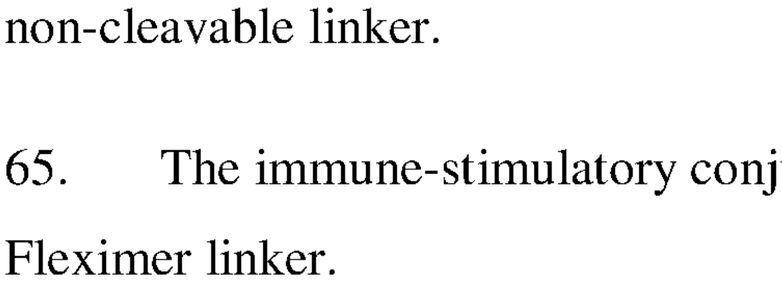
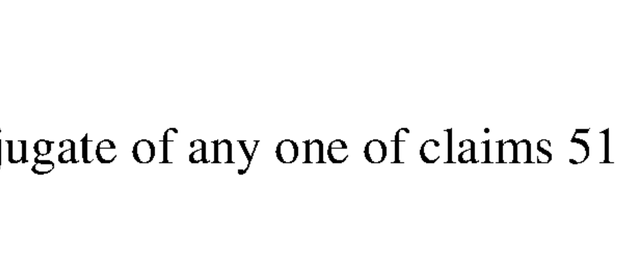
62. The immune-stimulatory conjugate of any one of claims 51 to 55, wherein the immune-stimulatory compound is an inhibitor of HSP90 or AAA-ATPase p97.

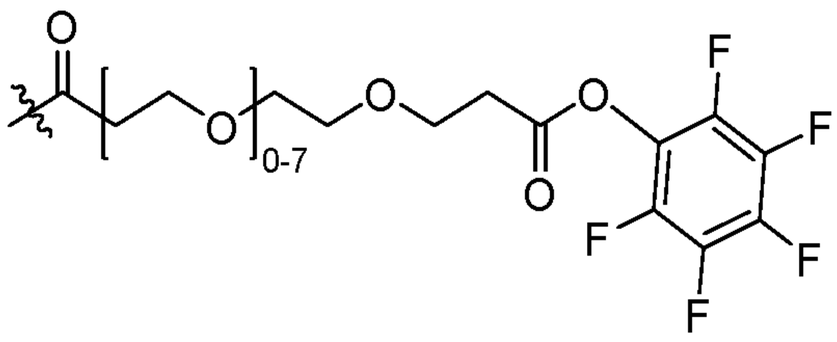
63. The immune-stimulatory conjugate of any one of claims 51 to 62, wherein the conjugate has immune-stimulatory activity with no or minimal cell processing of the conjugate.

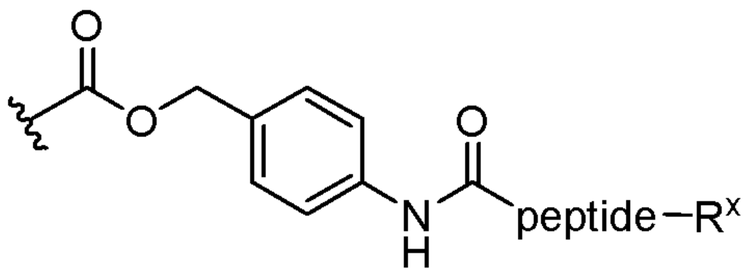
64. The immune-stimulatory conjugate of any one of claims 51 to 63, wherein the linker is a non-cleavable linker.

65. The immune-stimulatory conjugate of any one of claims 51 to 63, wherein the linker is a Fleximer linker.

66. The immune-stimulatory conjugate of any one of claims 51 to 63, wherein the linker comprises a carbamate and one or more amide linkages.

67. The immune-stimulatory conjugate of any one of claims 37 to 66, wherein the linker is represented by the formula , , , ,



, or 

, wherein R^x is a reactive moiety and wherein R^a is hydrogen, alkyl, sulfonate and methyl sulfonate.

68. The immune-stimulatory conjugate of any one of claims 37 to 67, wherein the linker is attached to the antibody construct at a cysteine or lysine residue of the antibody construct.

69. The immune-stimulatory conjugate of any one of claims 37 to 68, wherein the first antigen is a tumor antigen.

70. The immune-stimulatory conjugate of any one of claims 37 to 69, wherein the first antigen is at least 80% homologous to CD5, CD19, CD20, CD25, CD37, CD30, CD33, CD45, CAMPATH-1, BCMA, CS-1, PD-L1, B7-H3, B7-DC (PD-L2), HLD-DR, carcinoembryonic antigen (CEA), TAG-72, EpCAM, MUC1, MUC15, MUC16, folate-binding protein, A33, G250, prostate-specific membrane antigen (PSMA), ferritin, GD2, GD3, GM2, Le^y, CA-125, CA19-9, epidermal growth factor, p185HER2, IL-2 receptor, EGFRvIII (de2-7 EGFR), fibroblast activation protein (FAP), tenascin, a metalloproteinase, endosialin, vascular endothelial growth factor, αvβ3, WT1, LMP2, HPV E6 E7, Her-2/neu, p53 nonmutant, NY-ESO-1, MelanA/MART1, Ras mutant, gp100, p53 mutant, PR1, bcr-abl, tyrosinase, survivin, PSA, hTERT, a Sarcoma translocation breakpoint protein, EphA2, PAP, ML-IAP, AFP, ERG, NA17, PAX3, ALK, androgen receptor, cyclin B1, polysialic acid, MYCN, RhoC, TRP-2, fucosyl GM1, mesothelin (MSLN), PSCA, MAGE A1, MAGE A3, sLe(animal), CYP1B1, PLAV1, GM3, BORIS, Tn, GloboH, ETV6-AML, NY-BR-1, RGS5, SART3, STn, Carbonic anhydrase IX, PAX5, OY-TES1, Sperm protein 17, LCK, HMWMAA, AKAP-4, SSX2, XAGE 1, Legumain, Tie 3, VEGFR2, MAD-CT-1, PDGFR-B, MAD-CT-2, ROR2, , TRAIL1, MAGE A4, MAGE C2, GAGE, EGFR, CMET, HER3, EPCAM, CA6, NAPI2B, TROP2, Claudin-6 (CLDN6), Claudin-16 (CLDN16), CLDN18.2, RON, LY6E, FRA, DLL3, PTK7, Uroplakin-1B (UPK1B), LIV1, ROR1, STRA6, TMPRSS3, TMPRSS4, TMEM238, C1orf186, Fos-related antigen 1, VEGFR1, endoglin, PD-L1, VTCN1 (B7-H4), VISTA, gpNMB, or any fragment thereof.

71. The immune-stimulatory conjugate of any one of claims 37 to 70, wherein the antibody construct further comprises a second target binding domain.

72. The immune-stimulatory conjugate of claim 71, wherein the target binding domain specifically binds an immune cell.

73. The immune-stimulatory conjugate of claim 71 or 72, wherein the target binding domain is attached to the antibody construct at a C-terminal end of the Fc domain.

74. The immune-stimulatory conjugate of any one of claims 37 to 73, wherein the antibody construct is an antibody.

75. The immune-stimulatory conjugate of claim 74, wherein the antibody construct is a human antibody or a humanized antibody.

76. The immune-stimulatory conjugate of any one of claims 37 to 75, wherein the Fc domain is an Fc domain variant comprising at least one amino acid residue change as compared to a wild type sequence of the Fc domain.

77. The immune-stimulatory conjugate of any one of claims 37 to 38, 39 to 52 and 54 to 76, wherein the Fc domain has at least one amino acid residue change as compared to wildtype, wherein the Fc domain is at comprises at least 80% homologous to SEQ ID NO: 296, and wherein the at least one amino acid residue change is:

a) F243L, R292P, Y300L, L235V, and P396L, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898;

b) S239D and I332E, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898; or

c) S298A, E333A, and K334A, wherein numbering of amino acid residues in the Fc domain is relative to SEQ ID NO: 898.

78. The immune-stimulatory conjugate of any one of claims 37 to 38, 39 to 52, and 54 to 76, wherein the Fc domain has at least one amino acid residue change as compared to wildtype, wherein the Fc domain is at comprises at least 80% homologous to SEQ ID NO: 898, and wherein the at least one amino acid residue change is:

a) N297A, N297G, N297Q, N297D as in Kabat numbering and relative to SEQ ID NO: 898; or

b) K322A/L234A/L235A N296A as in Kabat numbering and relative to SEQ ID NO: 898; or

c) L234F/L235E/P331S N296A as in Kabat numbering and relative to SEQ ID NO: 898; or

d) P329G/L234A/L235A as in Kabat numbering and relative to SEQ ID NO: 898.

79. The immune-stimulatory conjugate of any one of claims 37 to 78, wherein the molar ratio of immune-stimulatory compound to antibody is less than 5.

80. A pharmaceutical composition comprising the conjugate of any one of claims 37 to 79 and a pharmaceutically acceptable excipient.

81. A method of treating cancer, comprising administering to a subject in need thereof the pharmaceutical composition of claim 80.

82. The use of the conjugate of any one of claims 37 to 79 or the pharmaceutical composition of claims 80 to 81 as a medicament for the treatment of cancer.

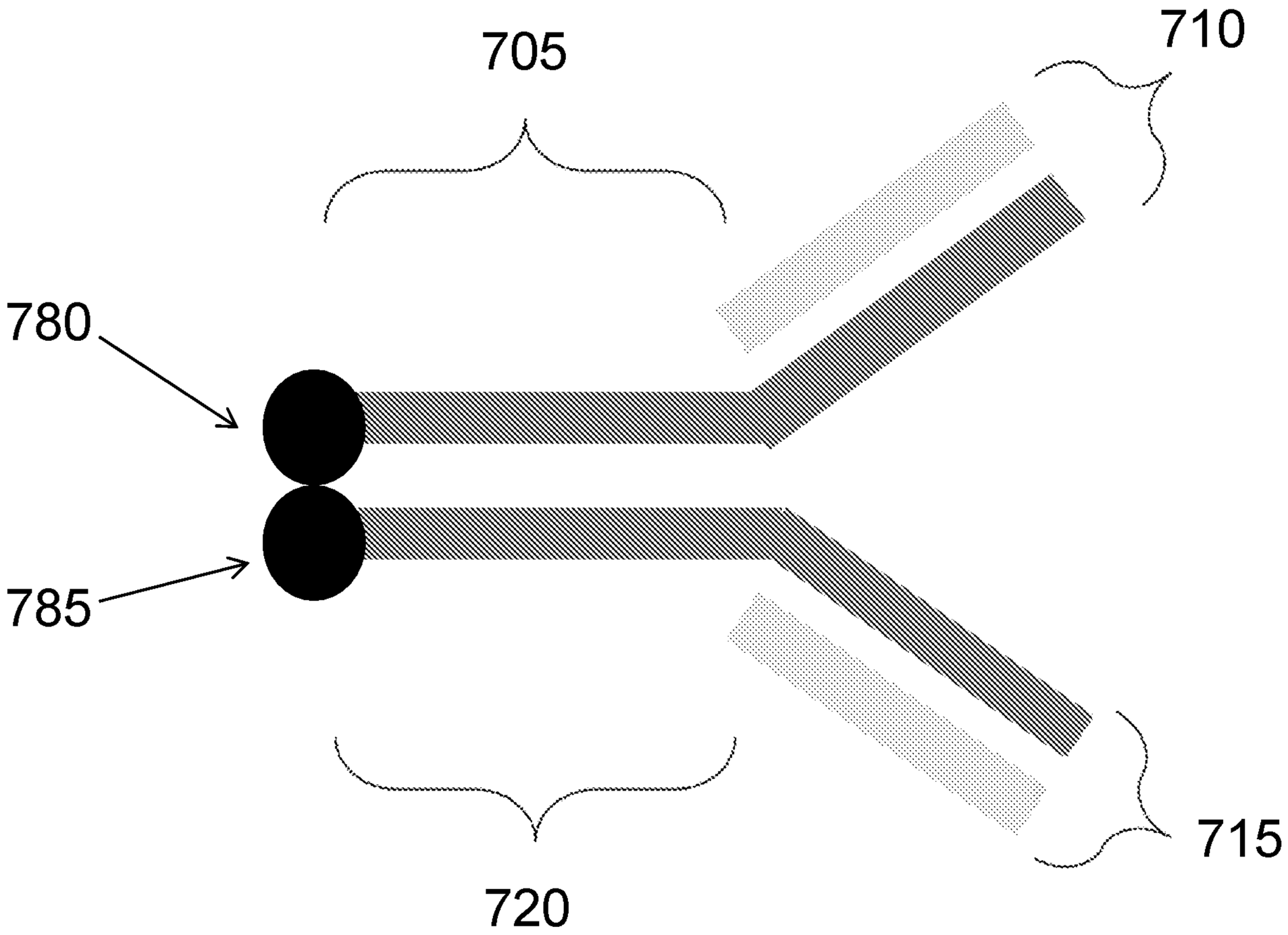


FIGURE 1

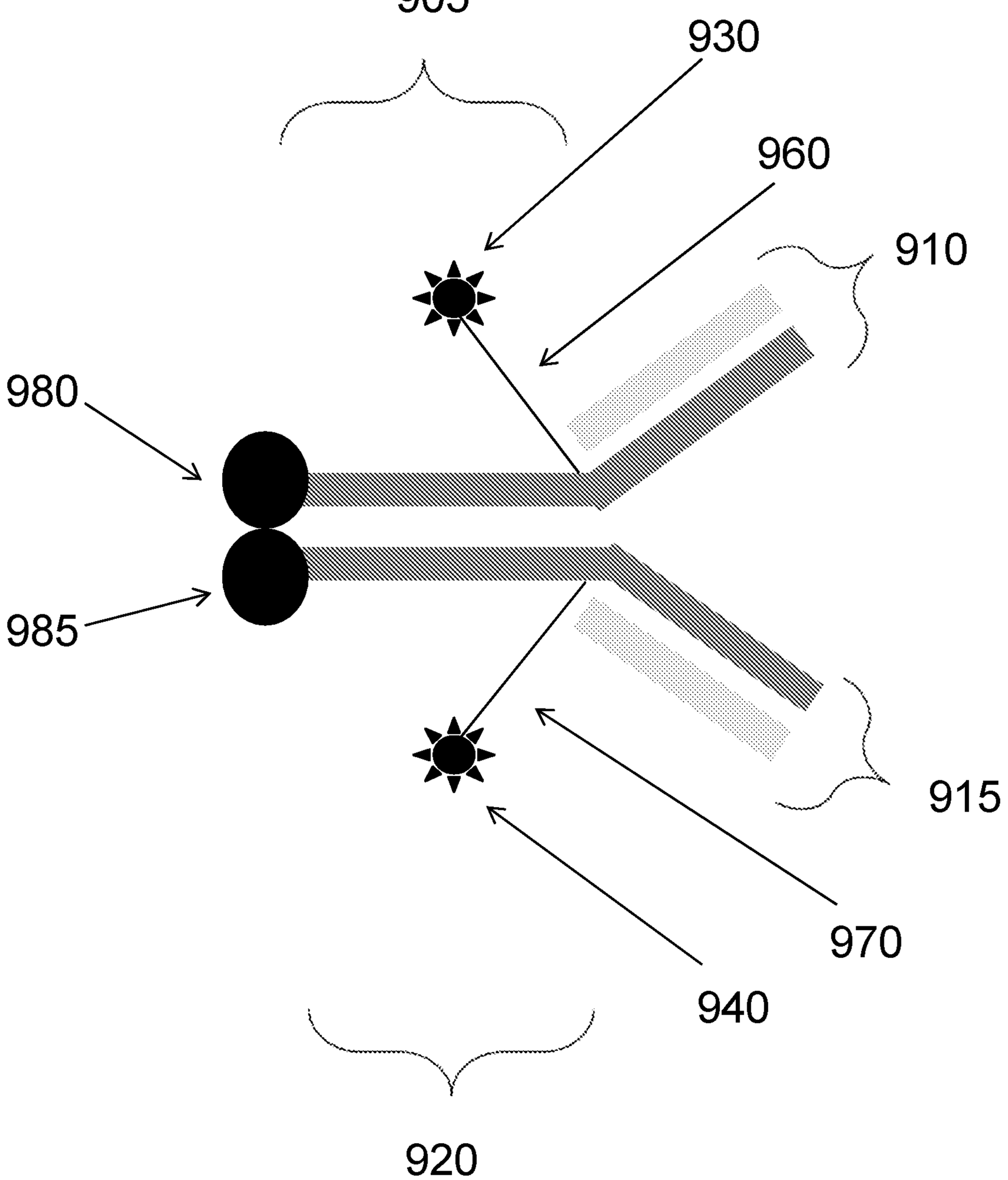


FIGURE 2

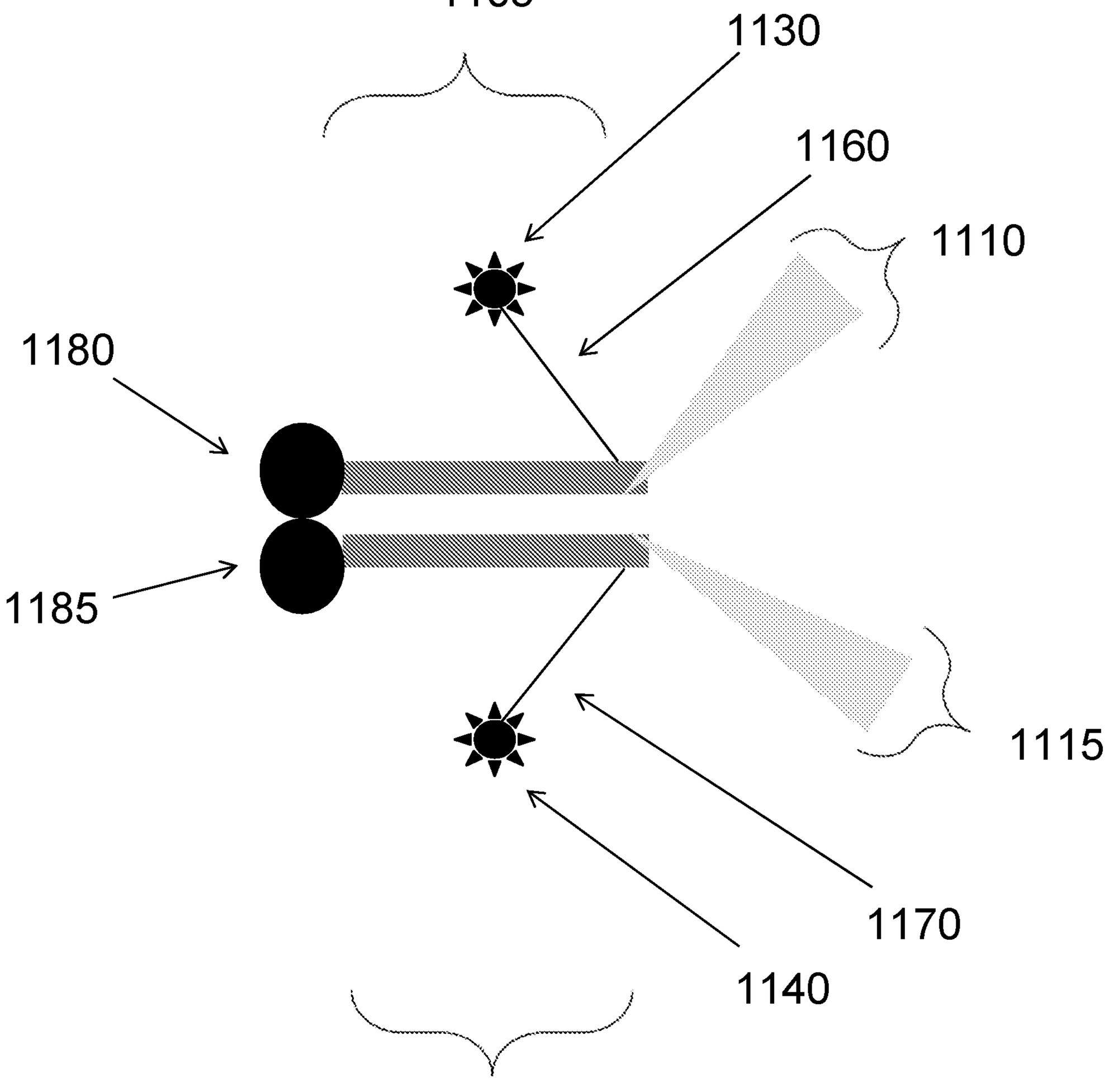


FIGURE 3

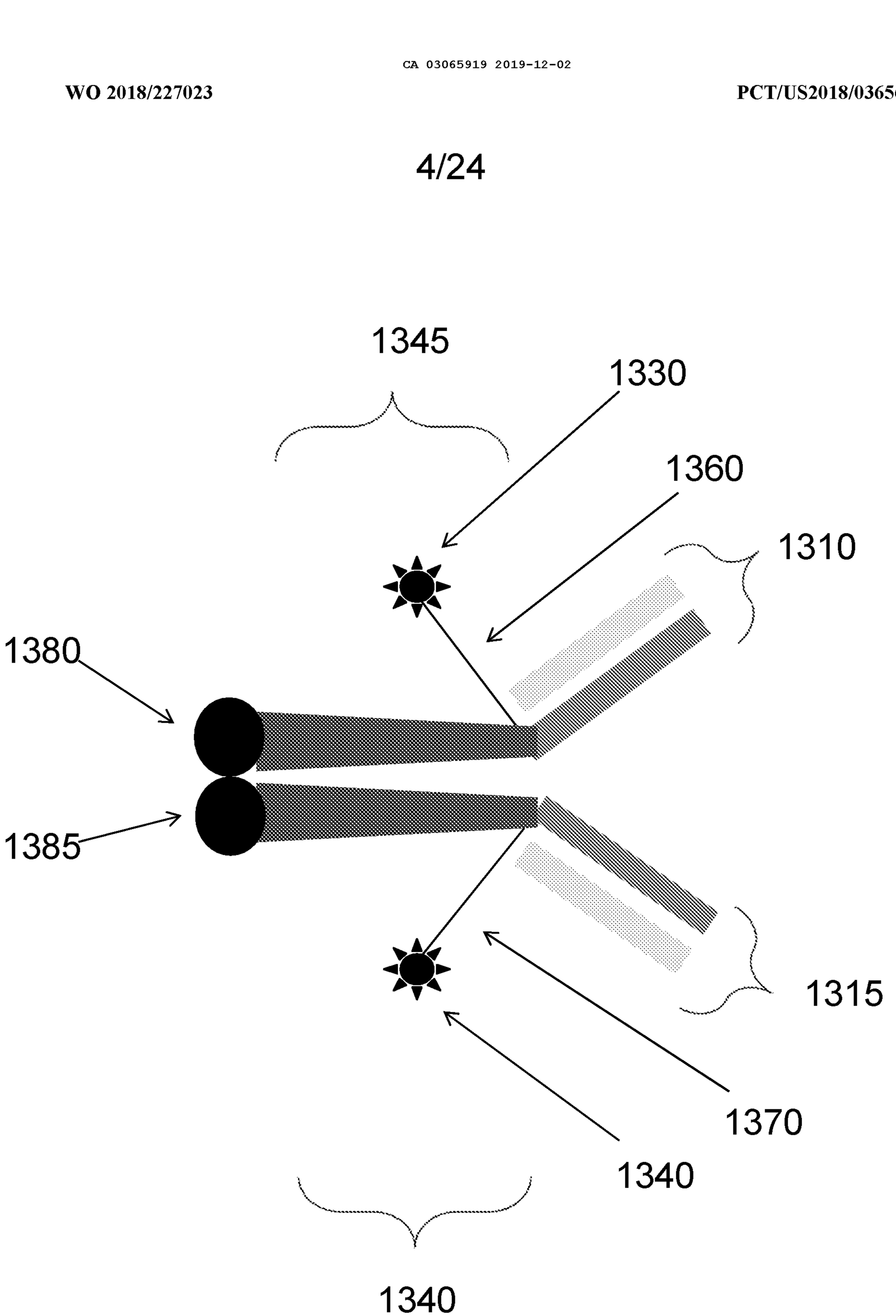


FIGURE 4

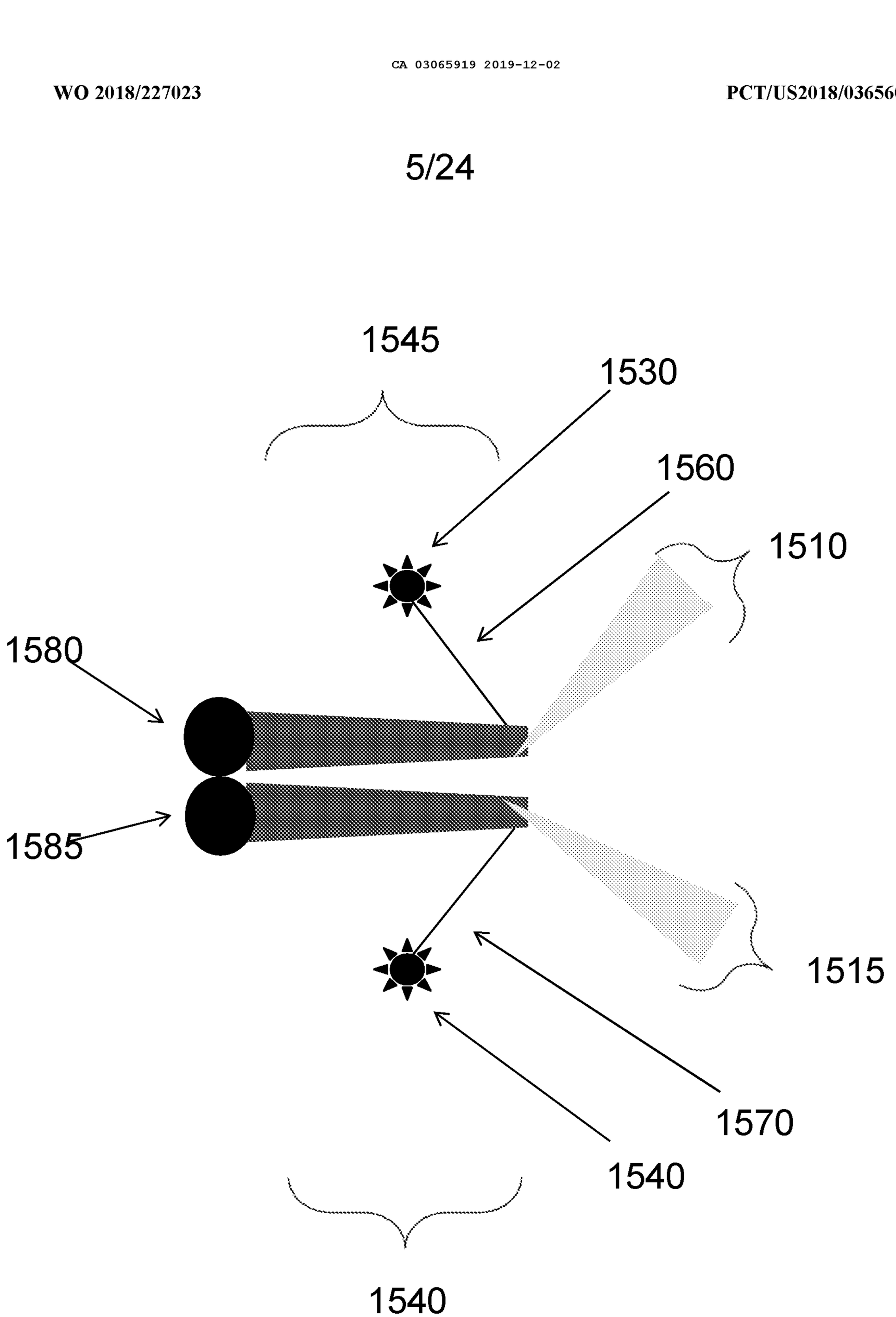


FIGURE 5

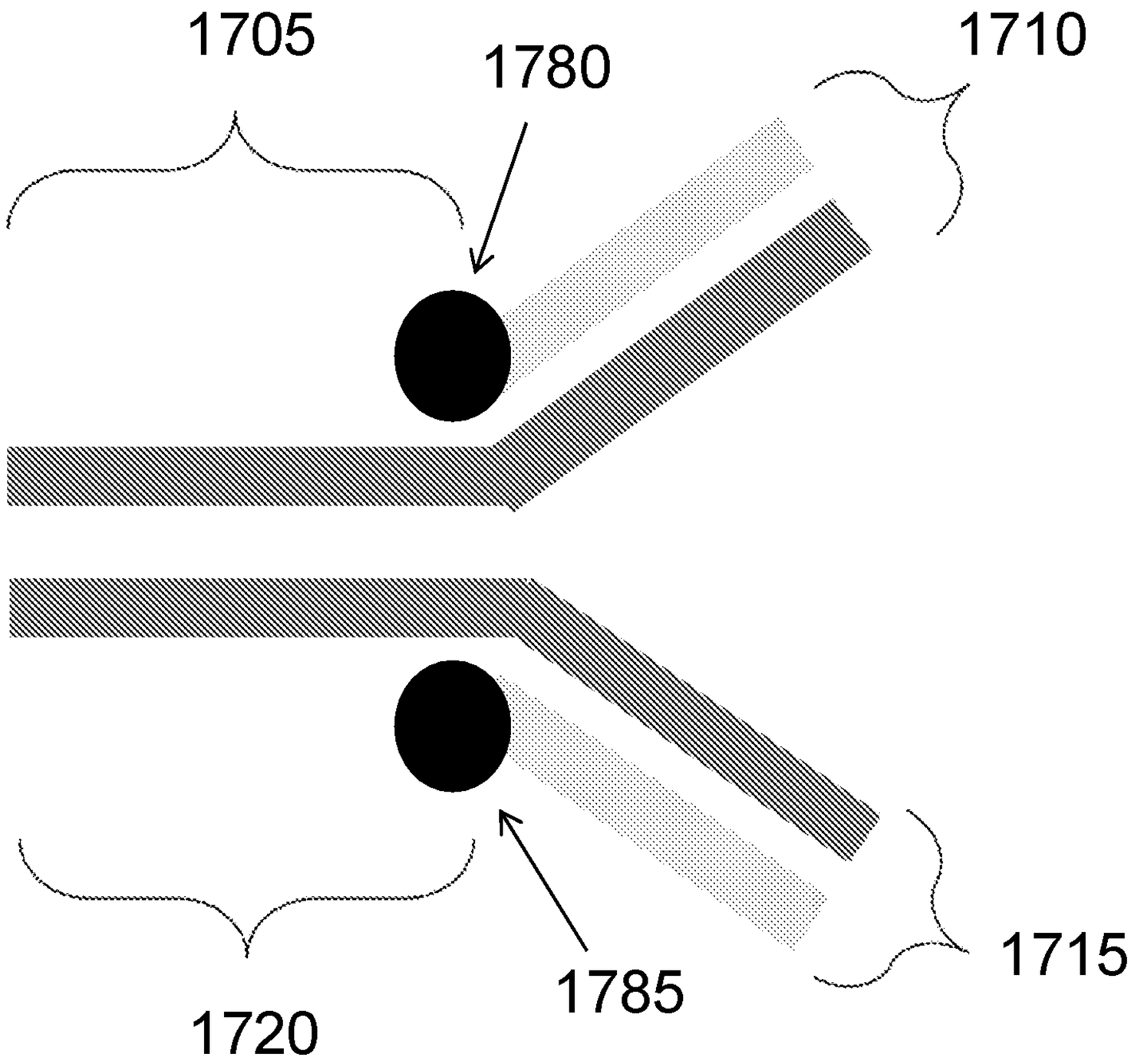


FIGURE 6

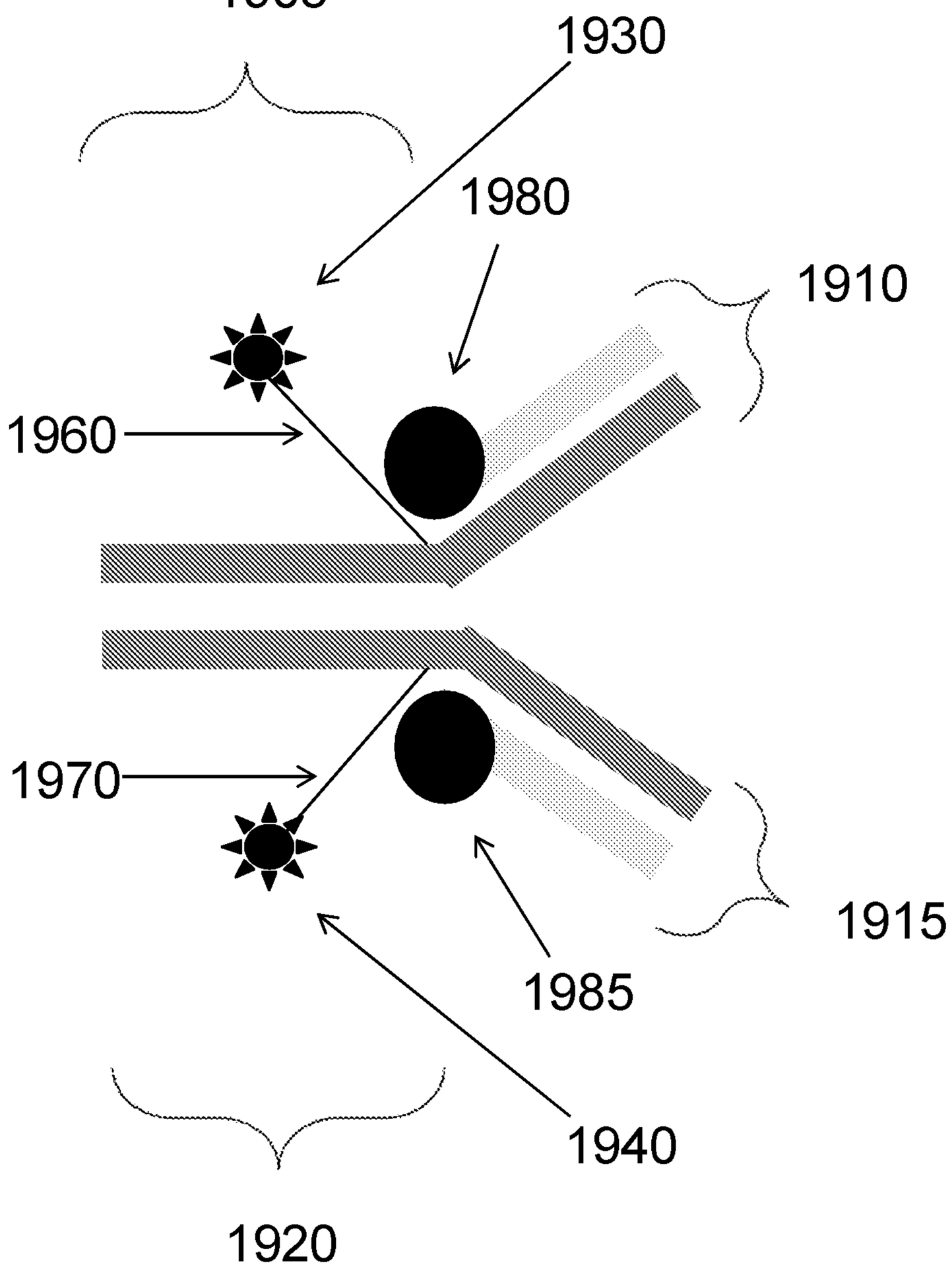


FIGURE 7

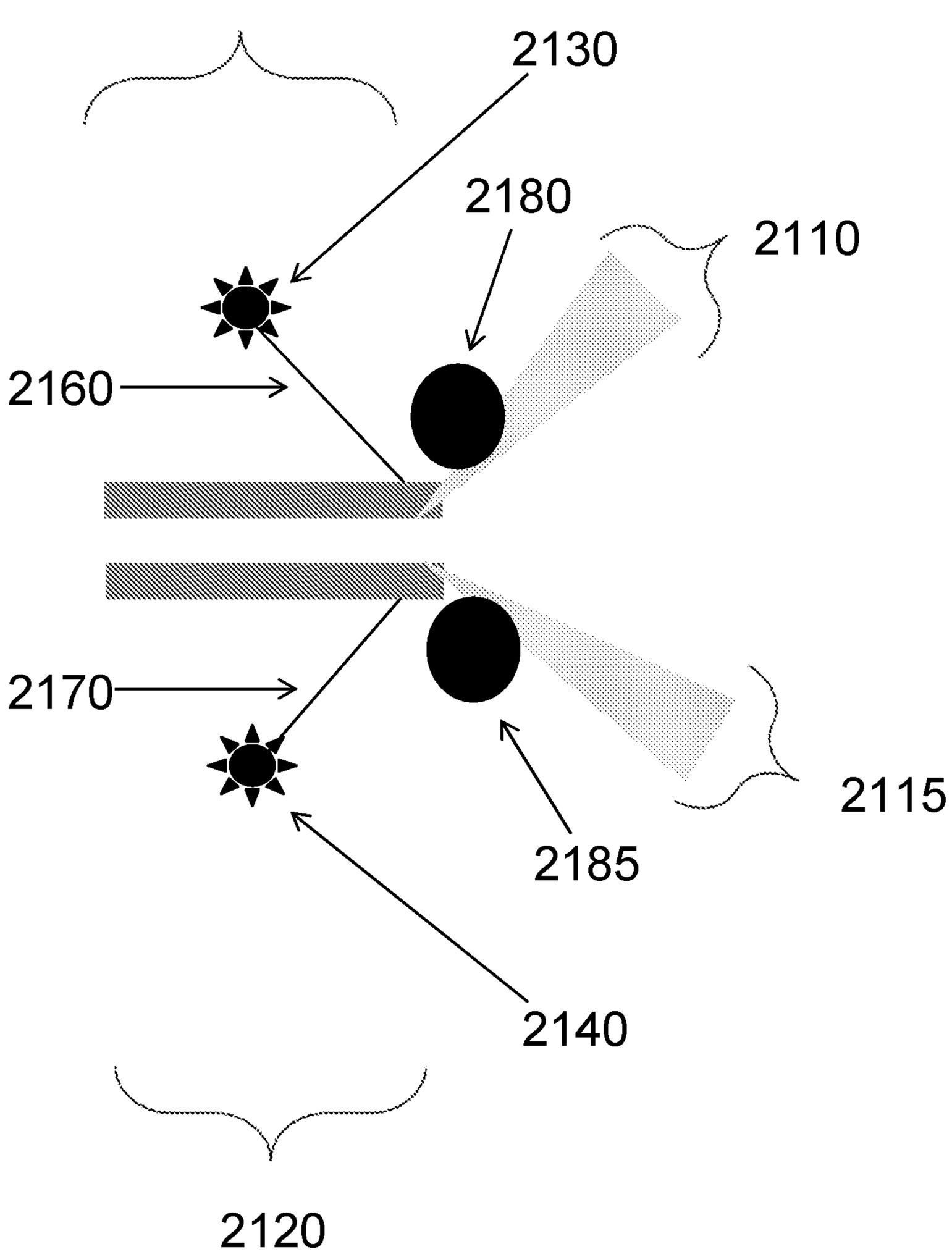


FIGURE 8

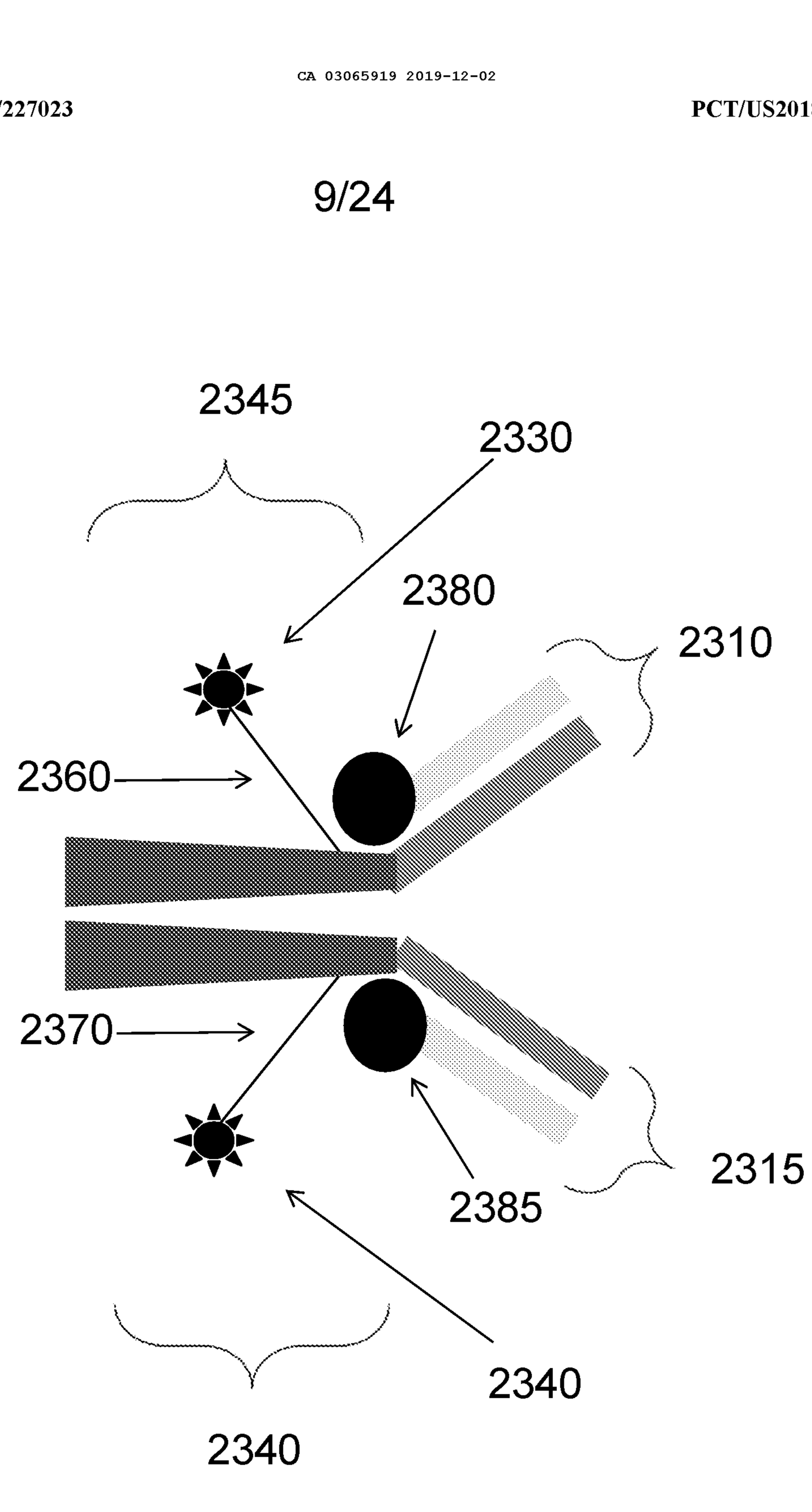


FIGURE 9

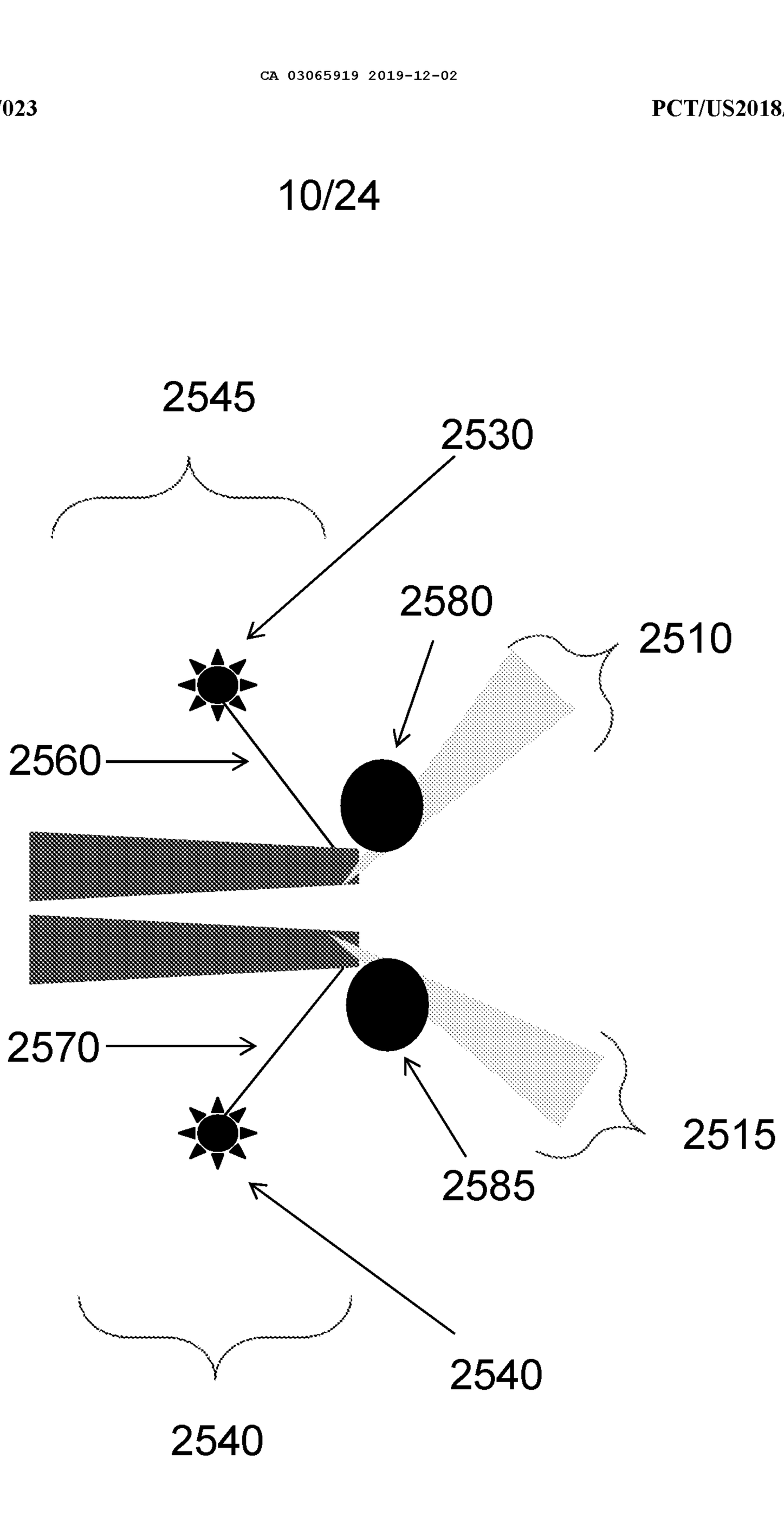


FIGURE 10

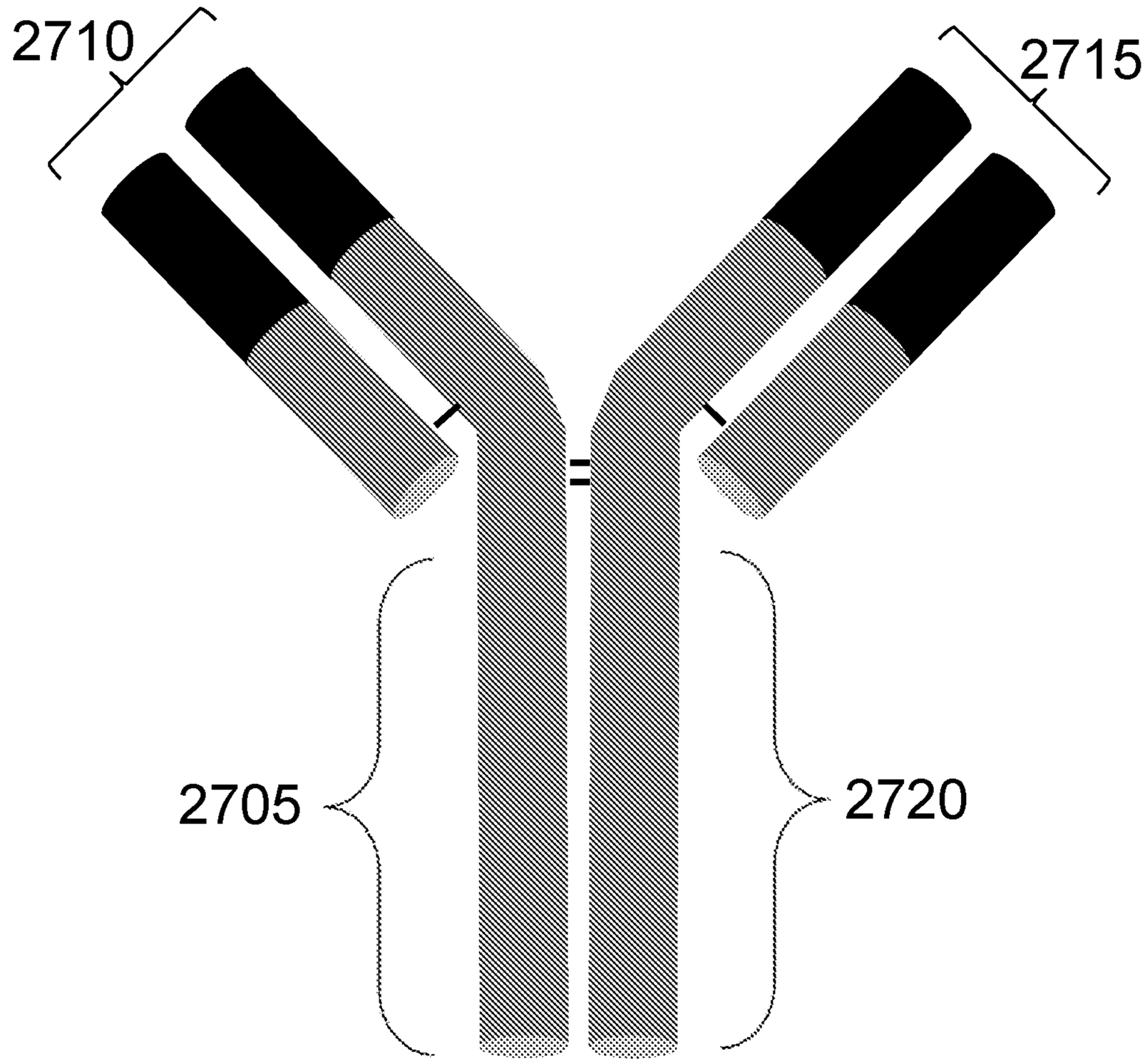


FIGURE 11

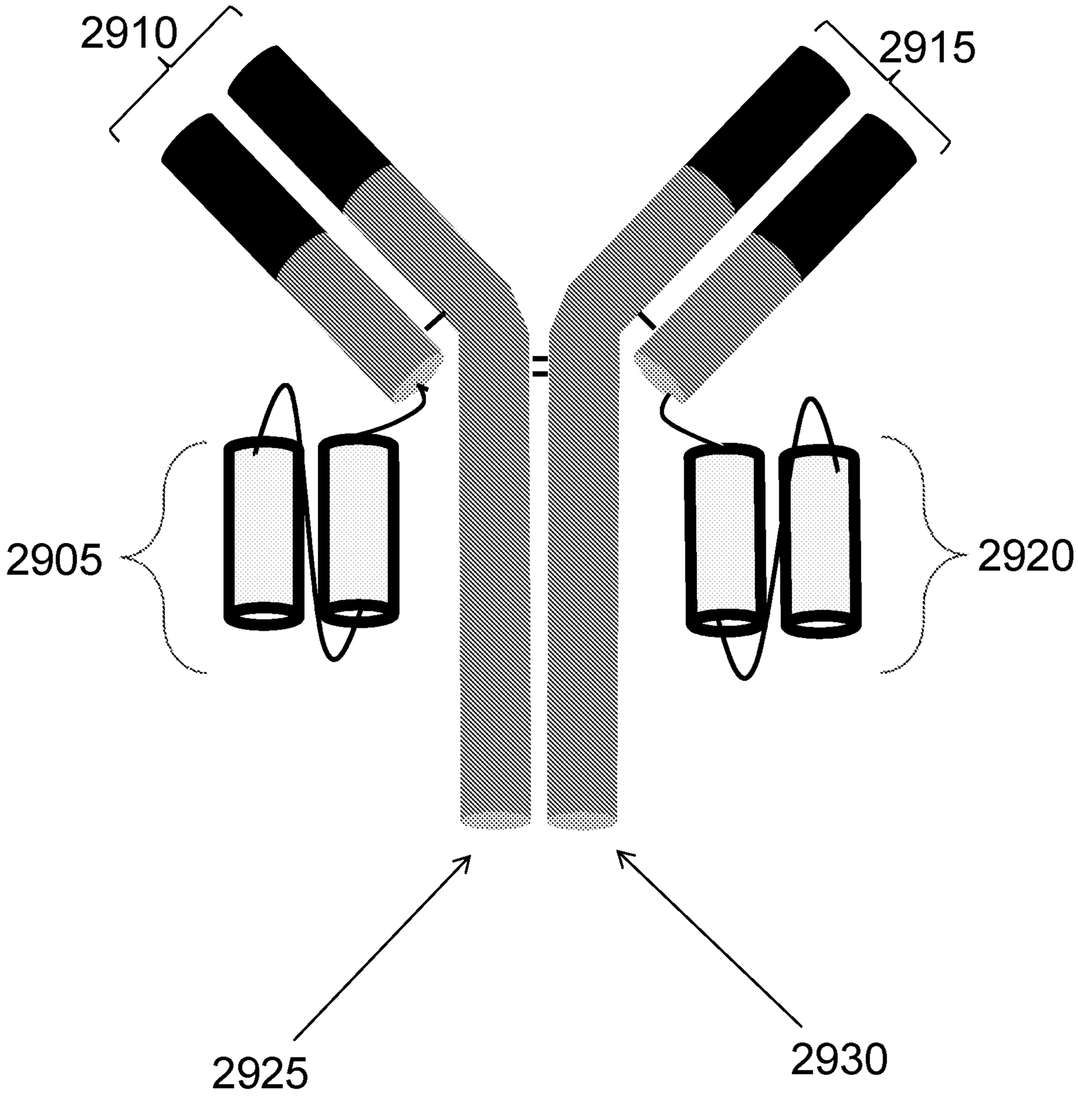


FIGURE 12

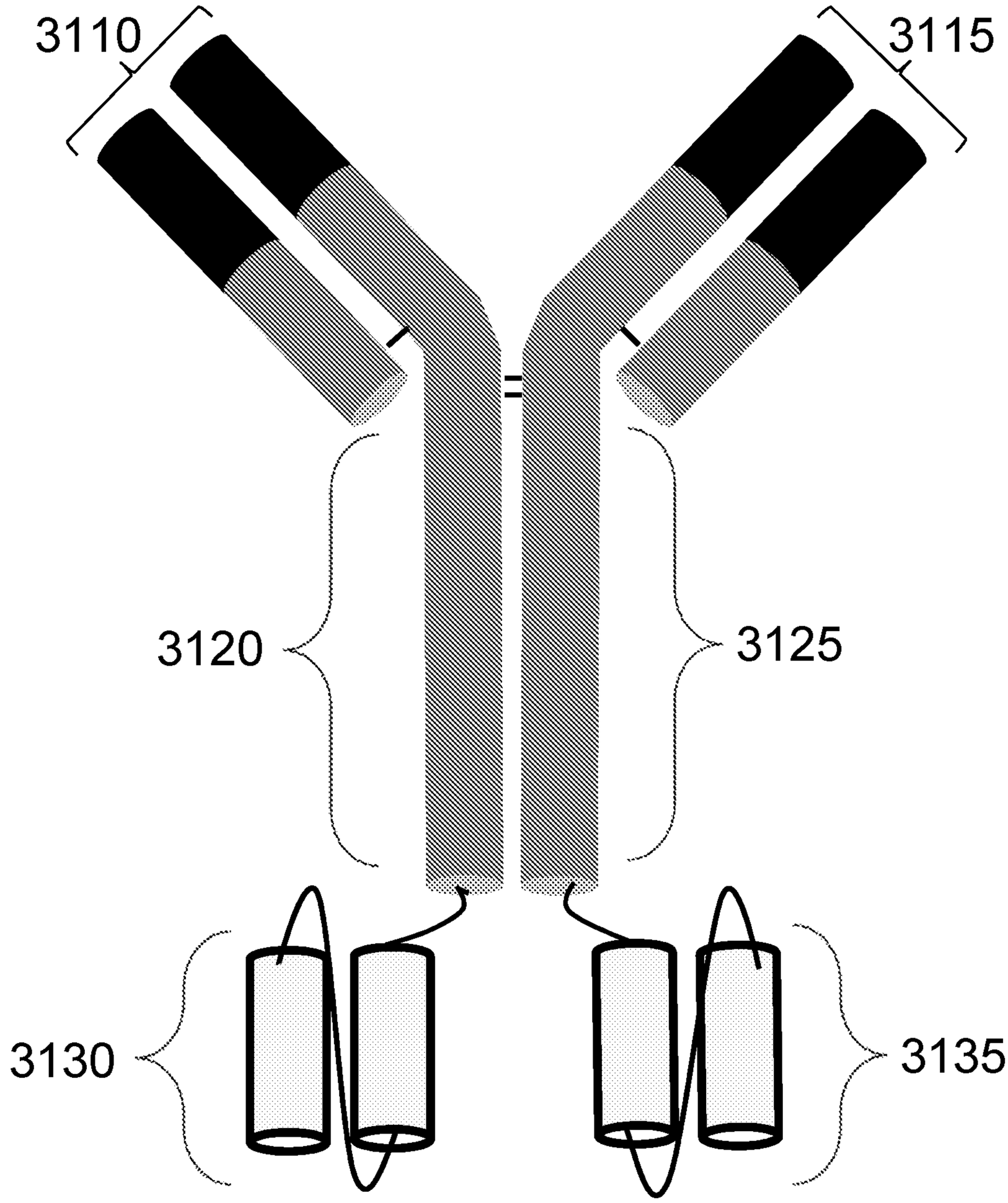


FIGURE 13

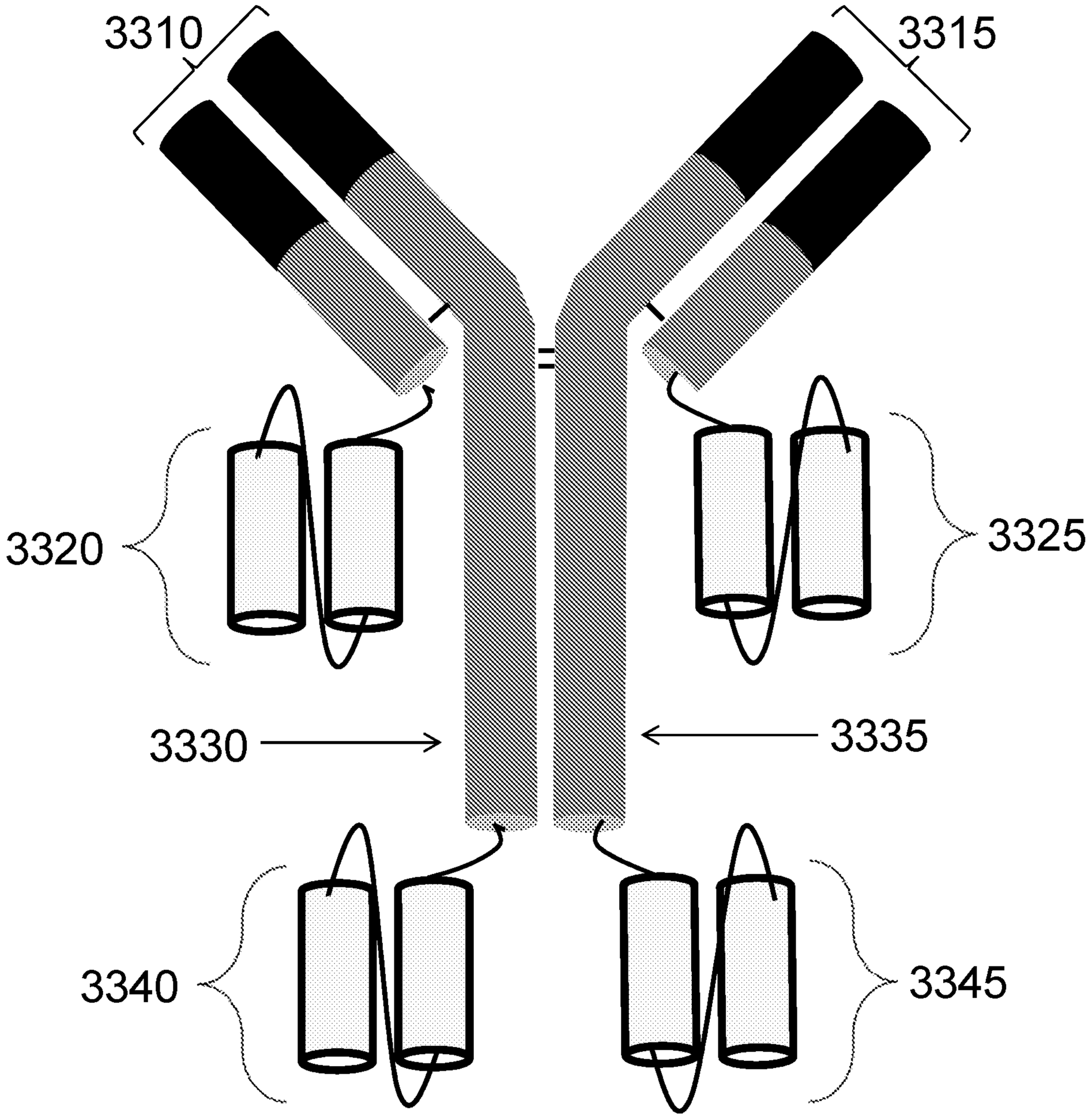


FIGURE 14

FIGURE 15A

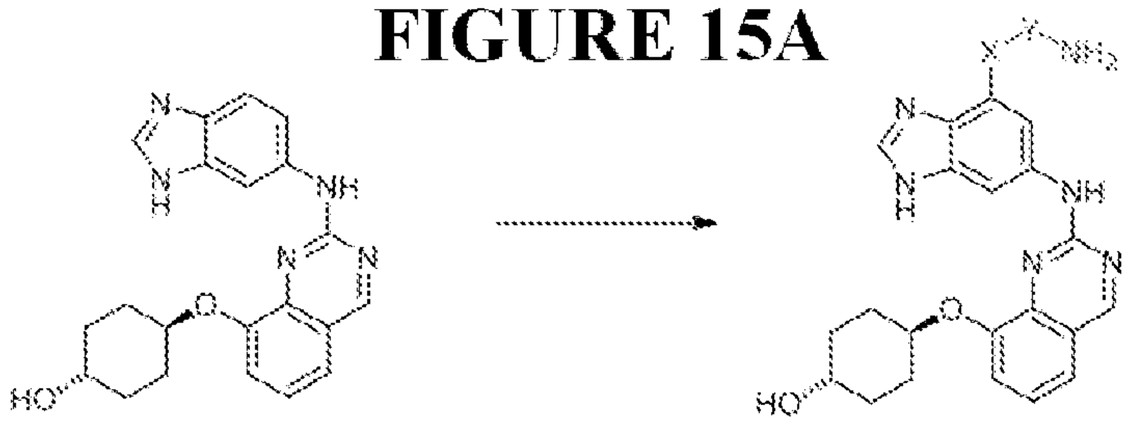


FIGURE 15B

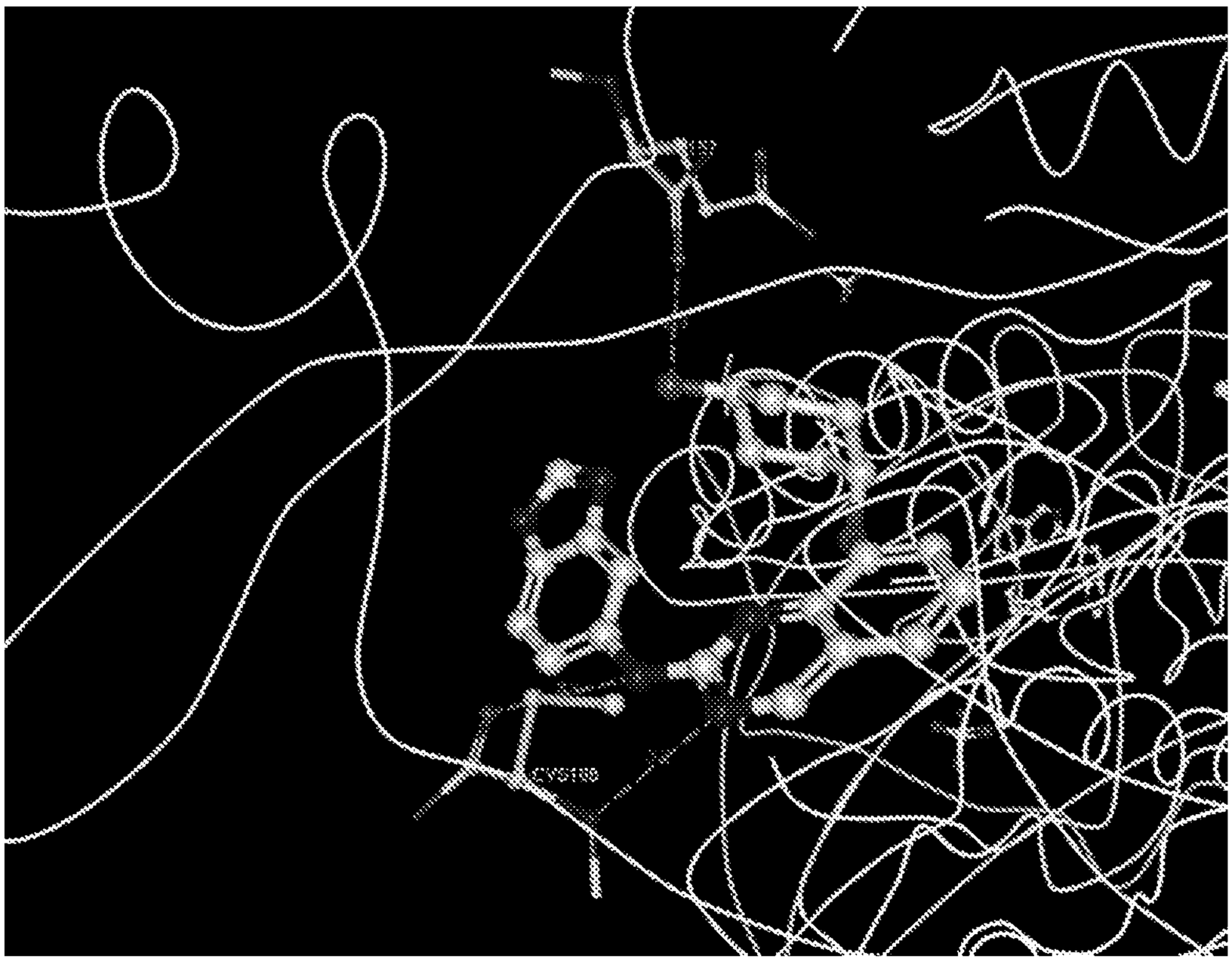
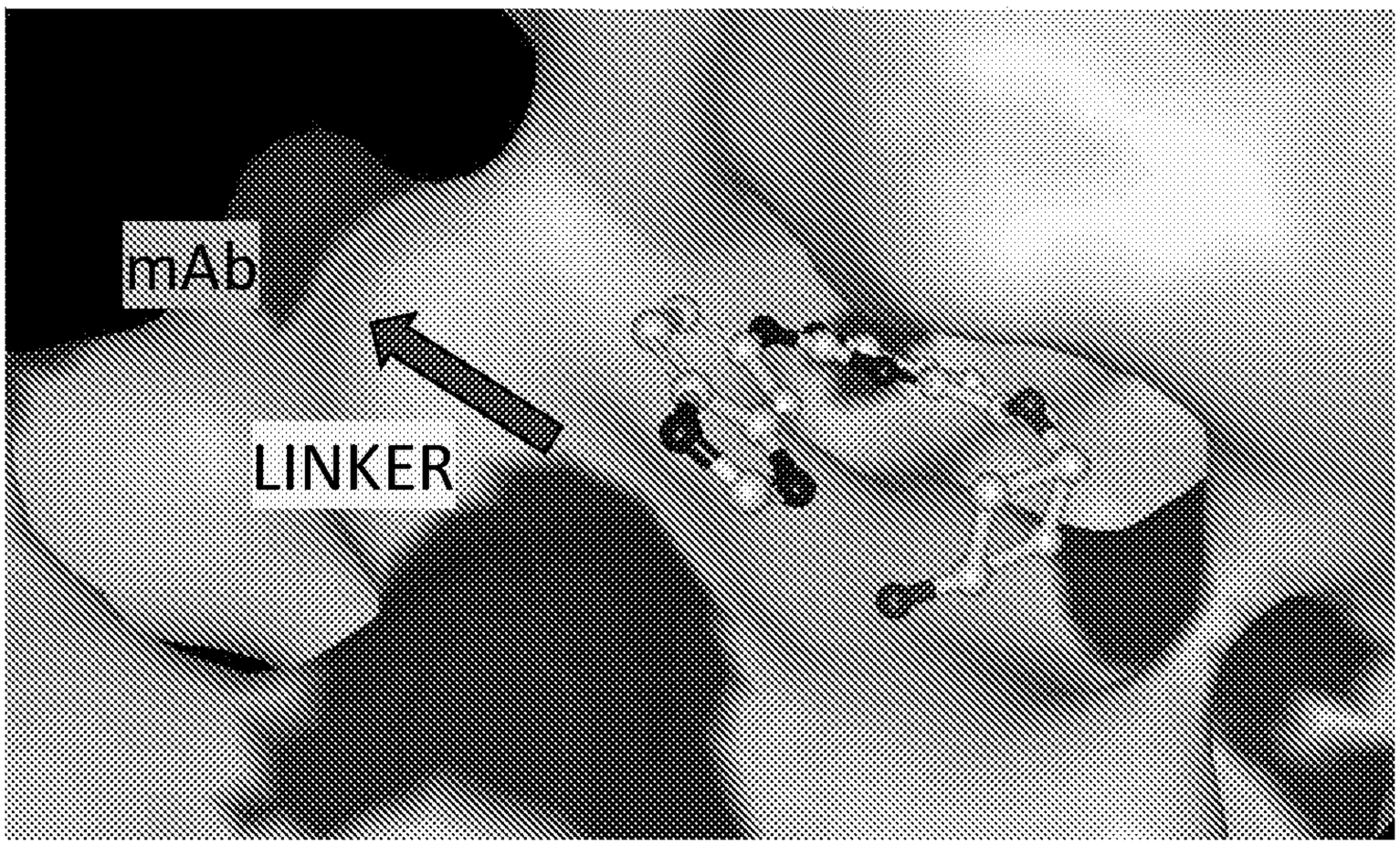


FIGURE 15C



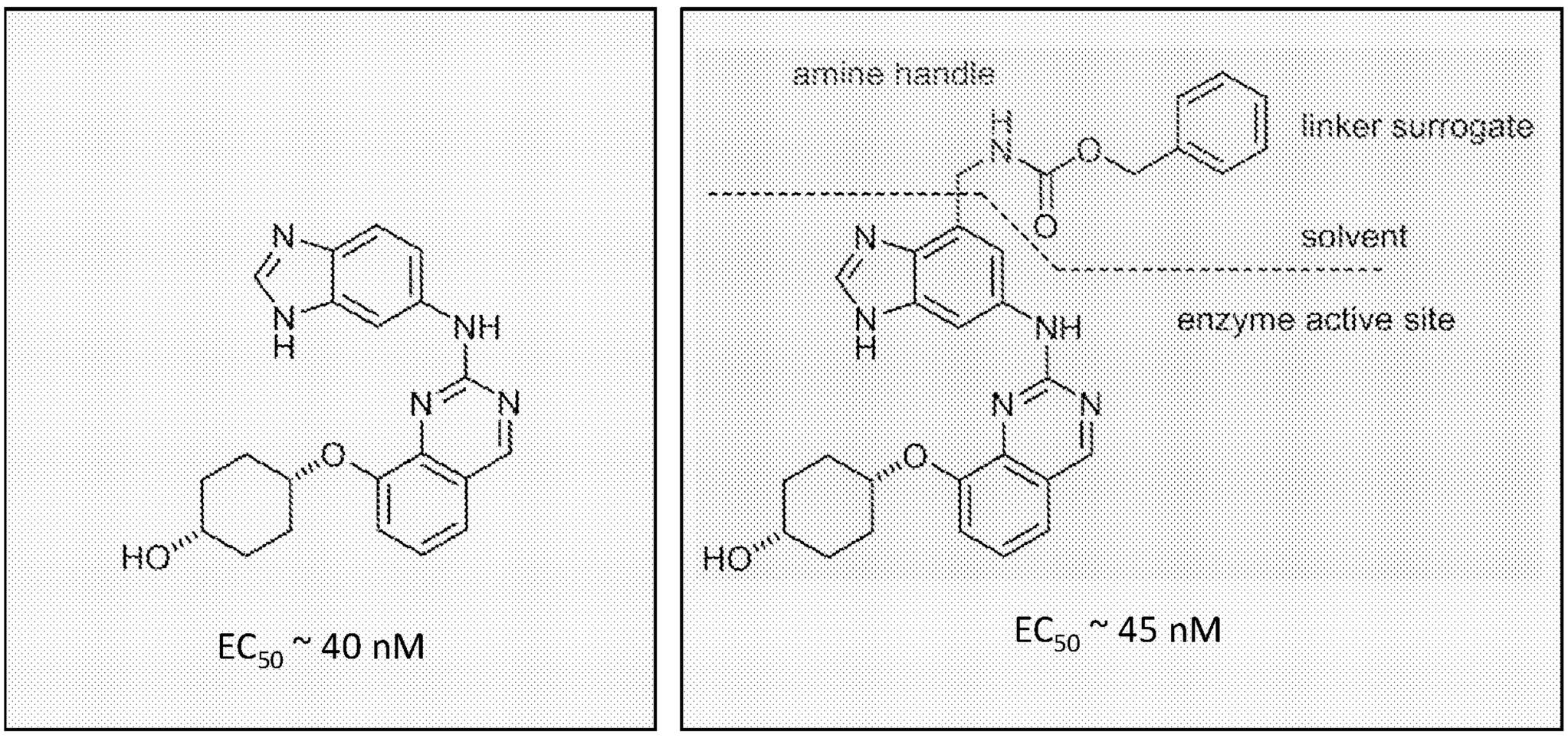

Parent
Designed Inhibitor
amine handle
linker surrogate
solvent
enzyme active site
EC50 ~ 40 nM
EC50 ~ 45 nM

FIGURE 16

FIGURE 17A

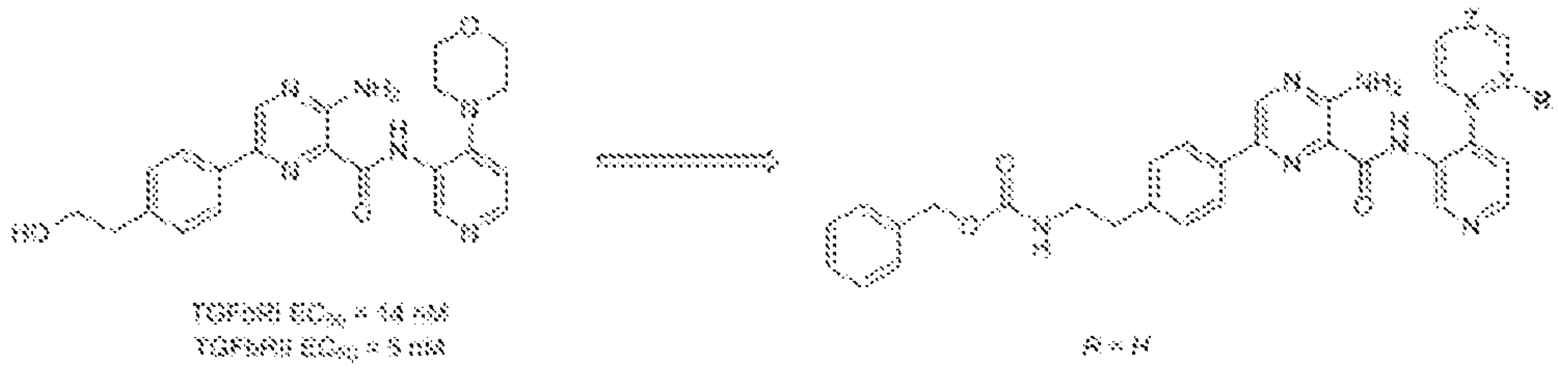


FIGURE 17B

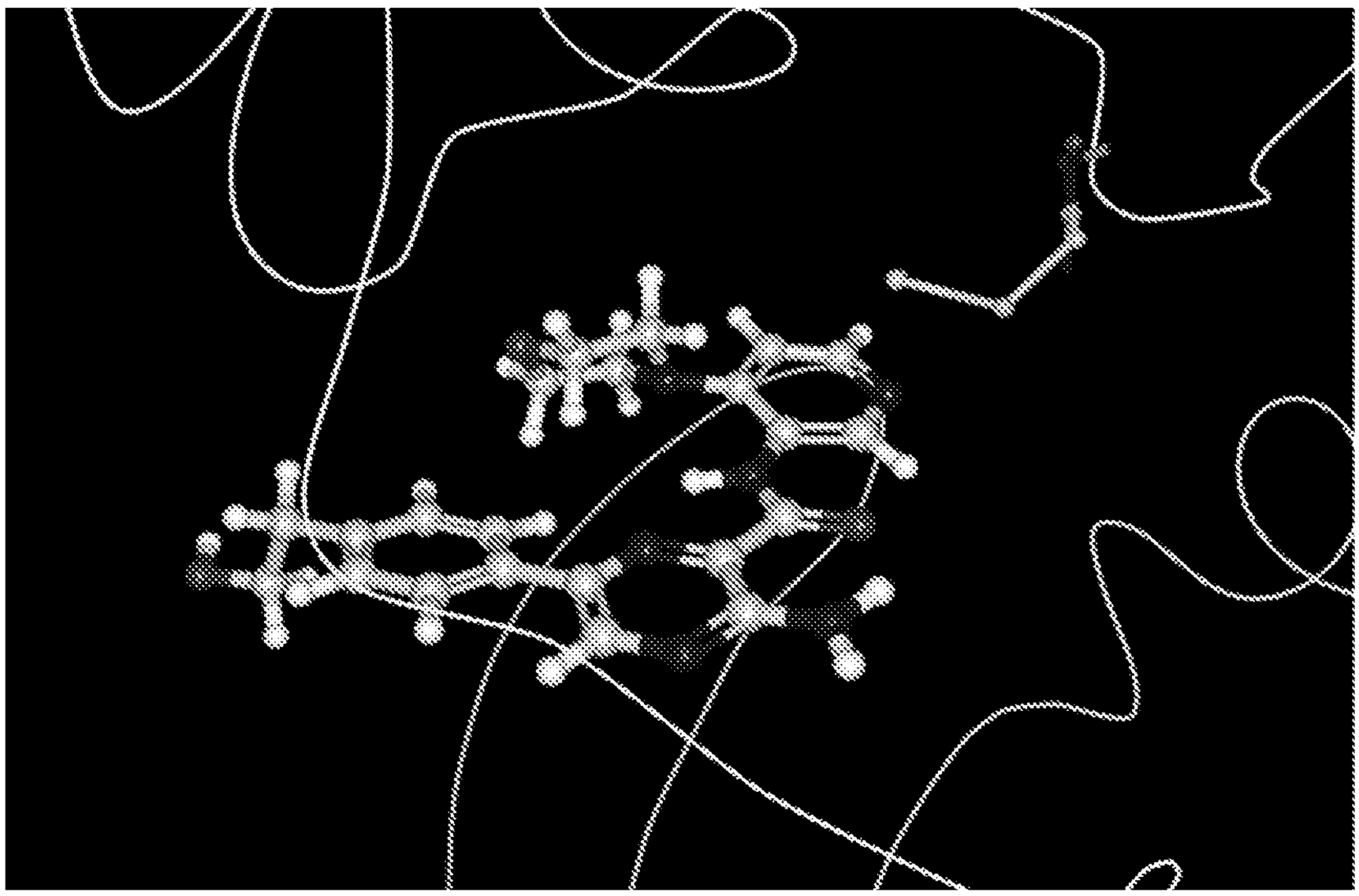


FIGURE 17C

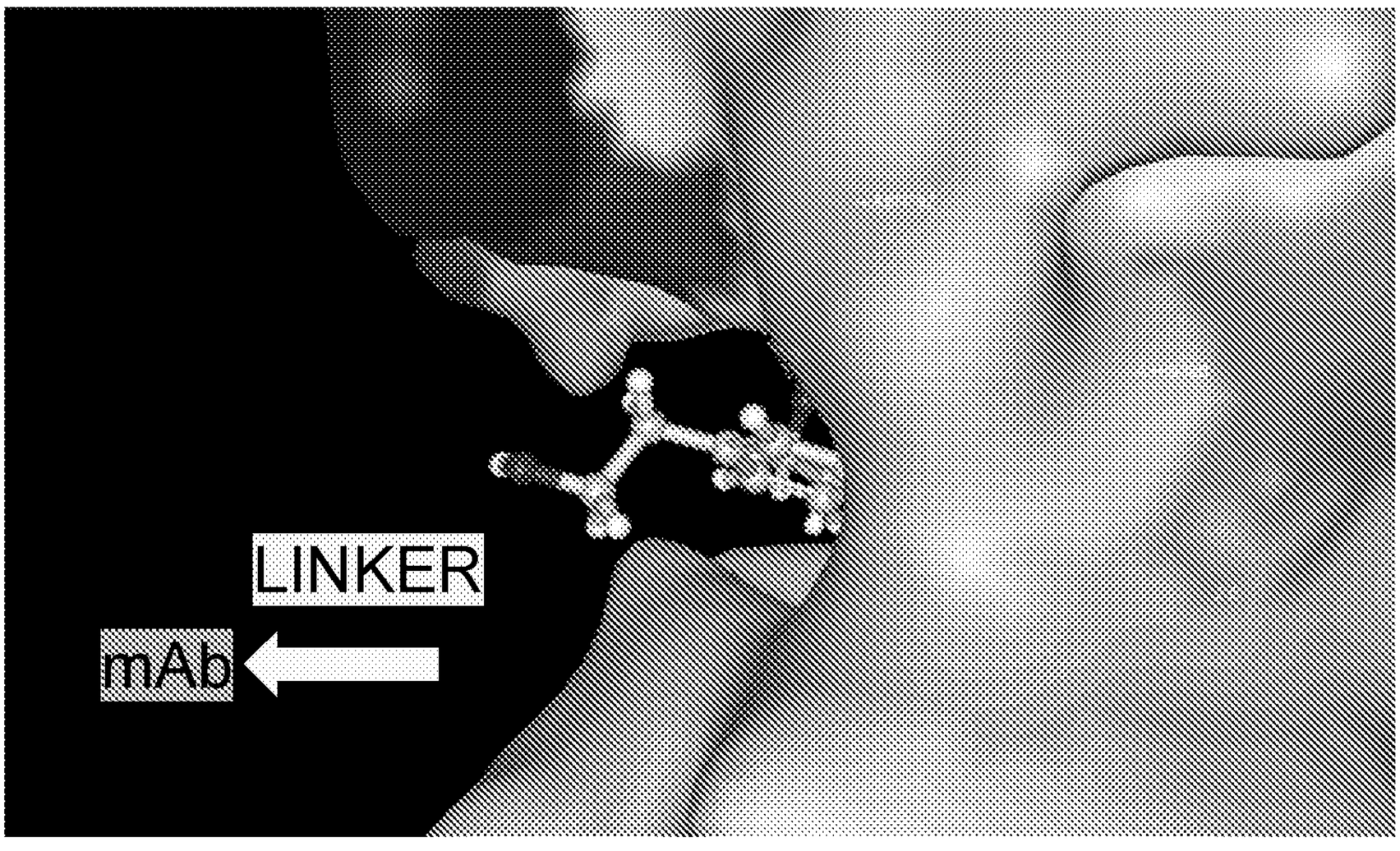
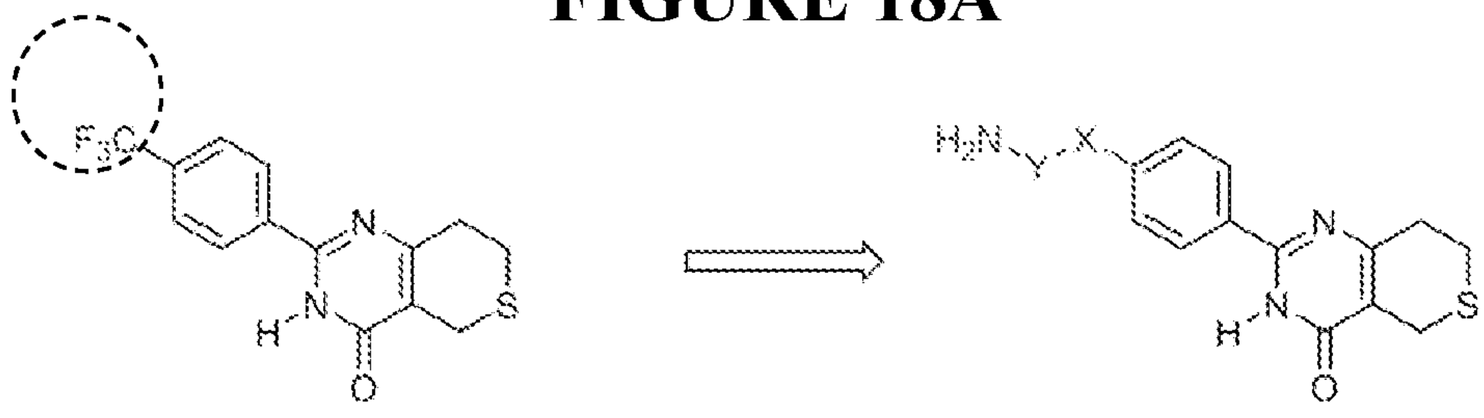


FIGURE 18A



TNKS1 IC_{50} = 13 nM
TNKS2 IC_{50} = 5 nM

FIGURE 18B

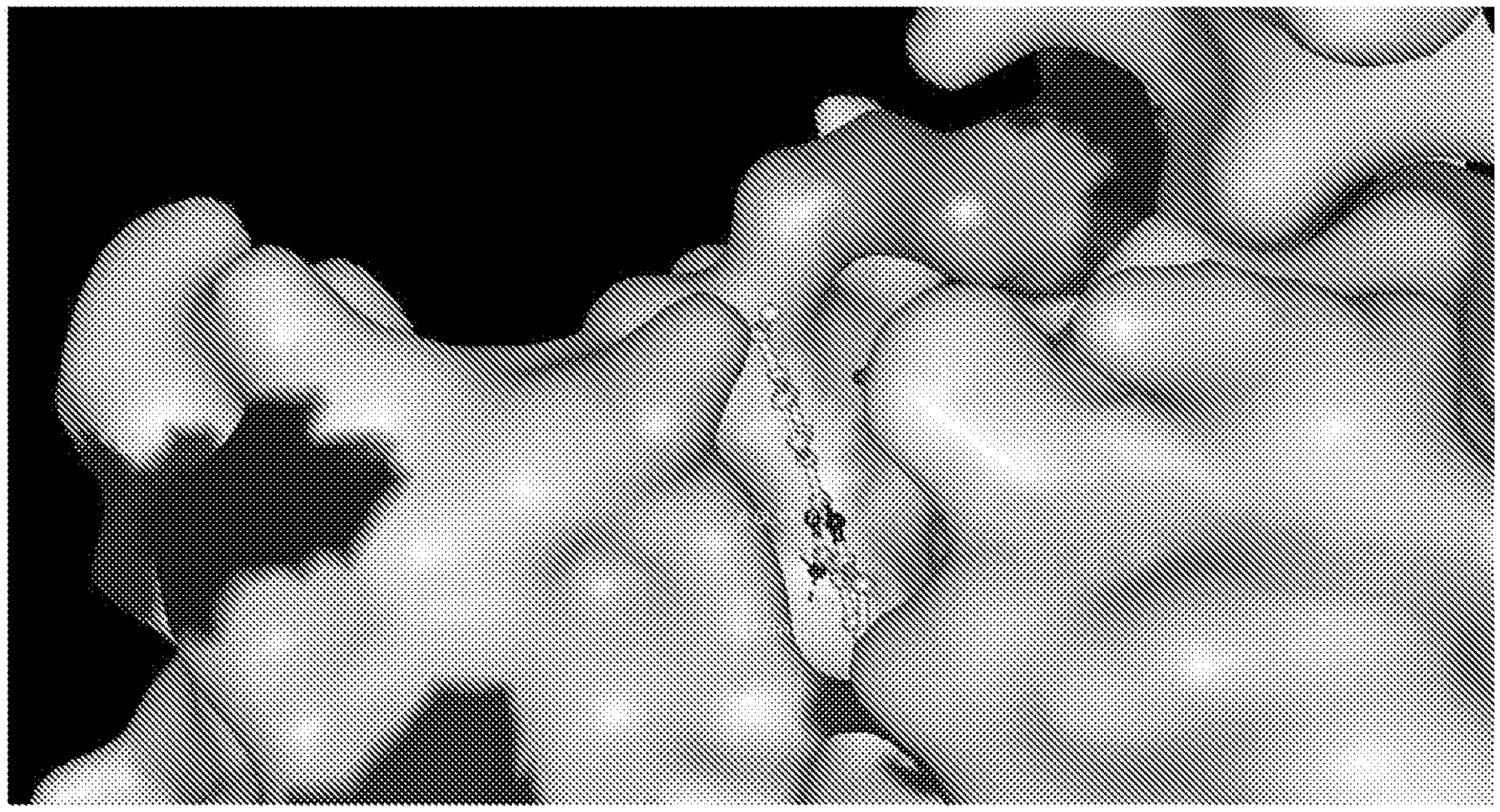


FIGURE 18C

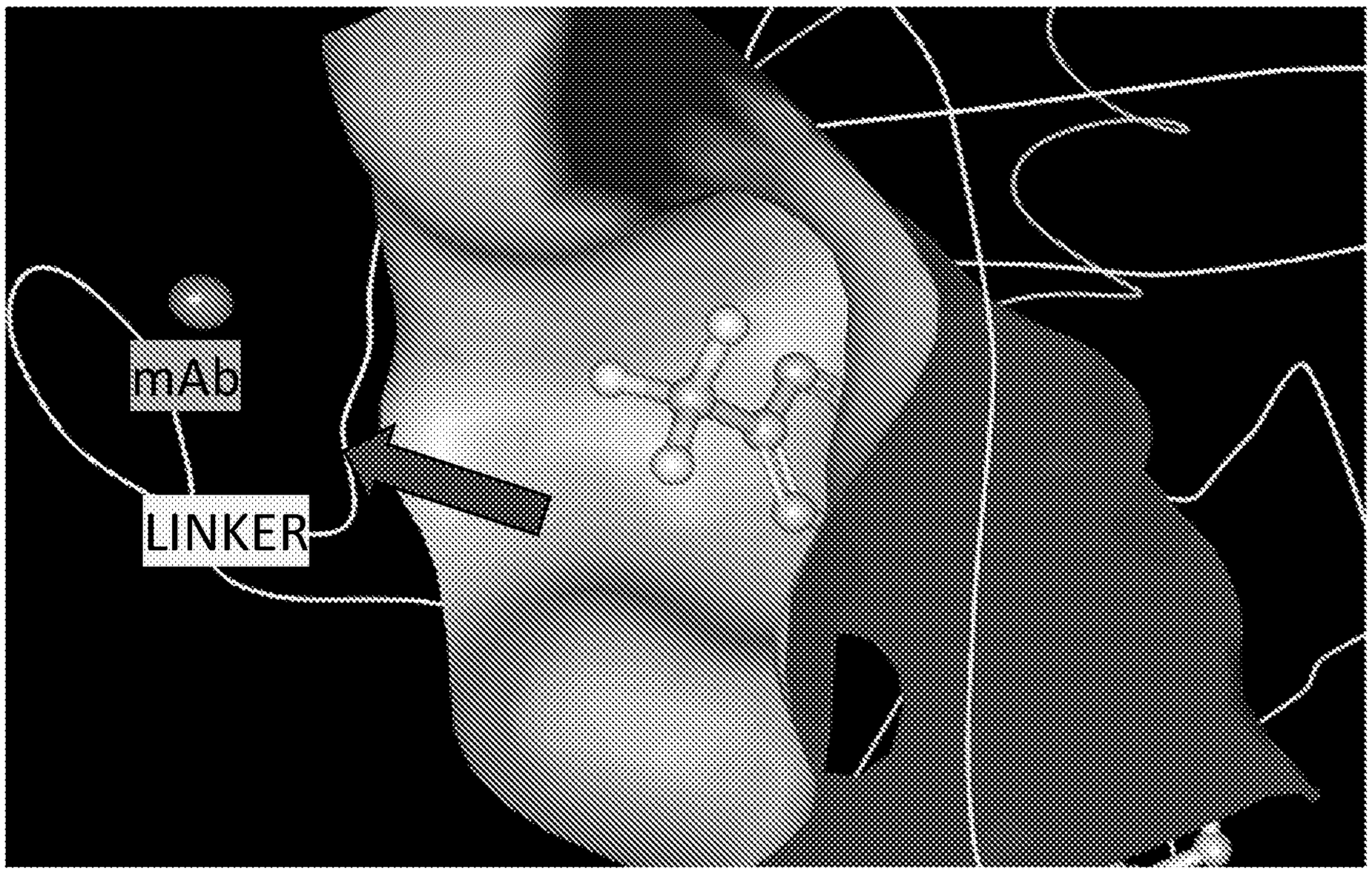
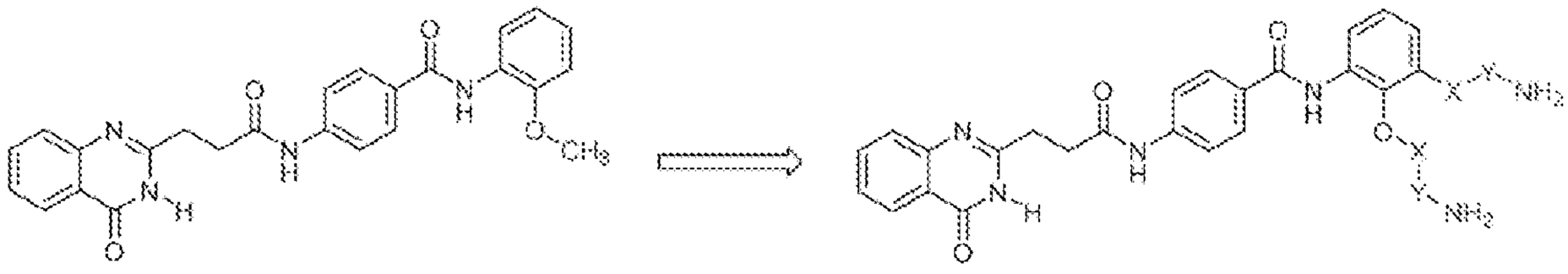


FIGURE 19A



TNKS1 IC_{50} = 8 nM
TNKS2 IC_{50} = 2 nM

FIGURE 19B

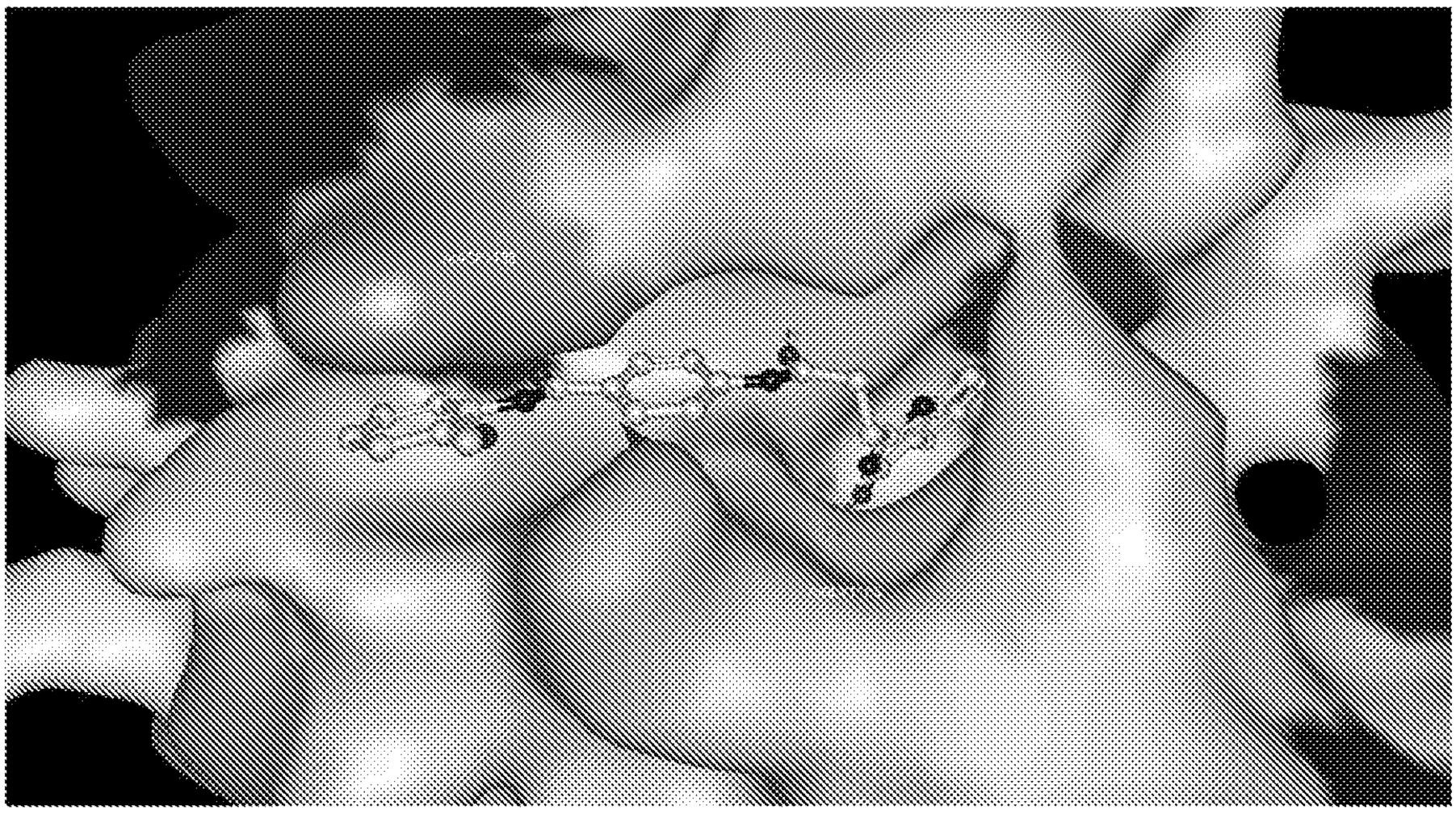


FIGURE 19C

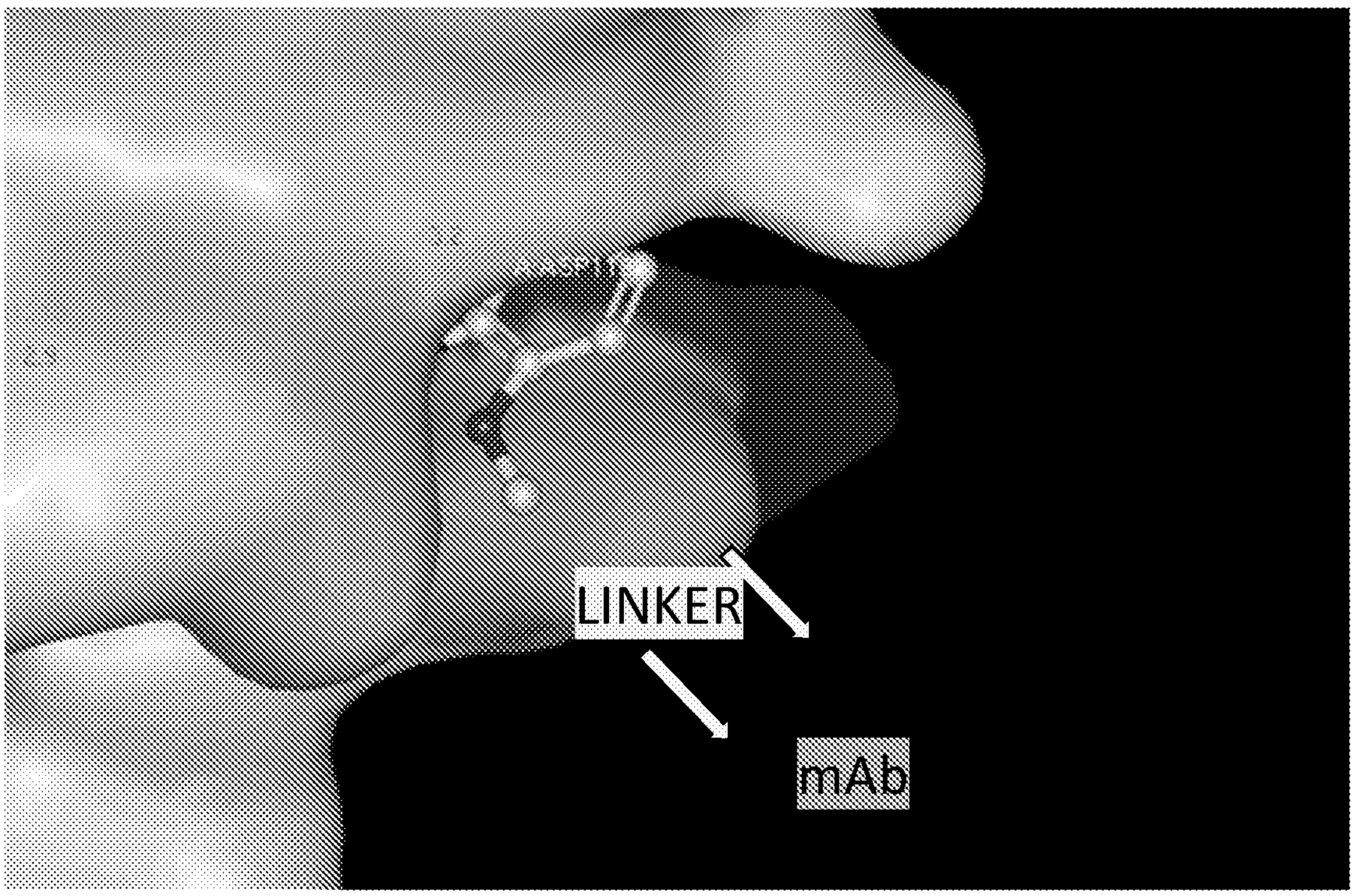


FIGURE 20A

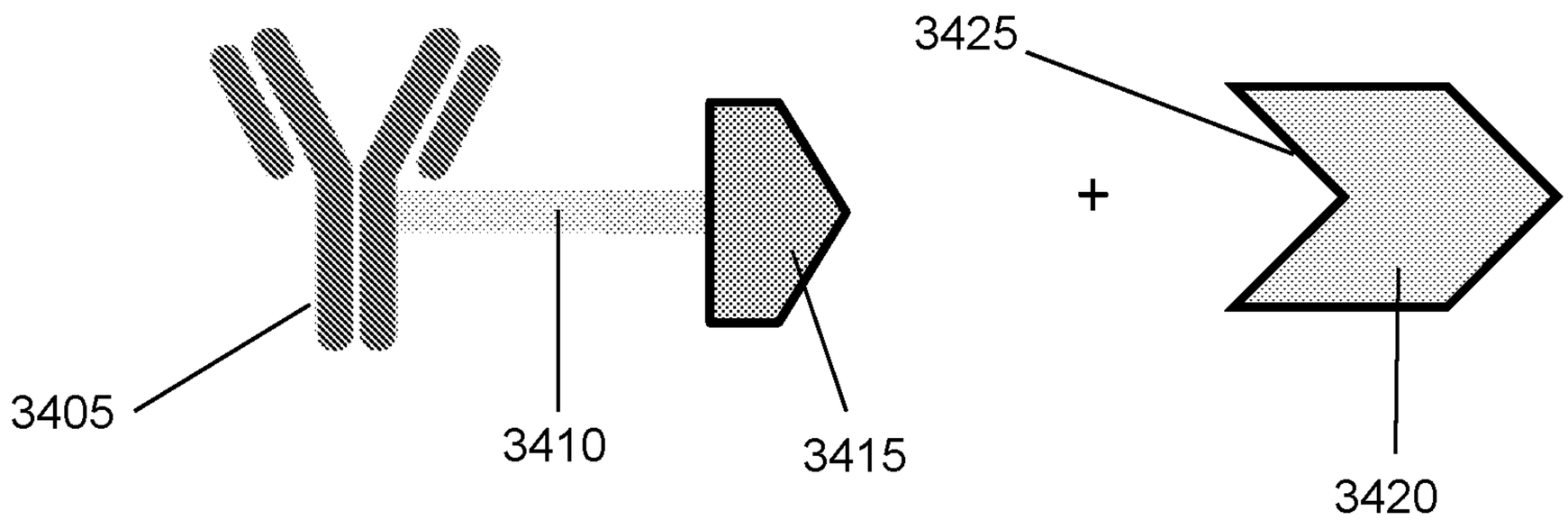


FIGURE 20B

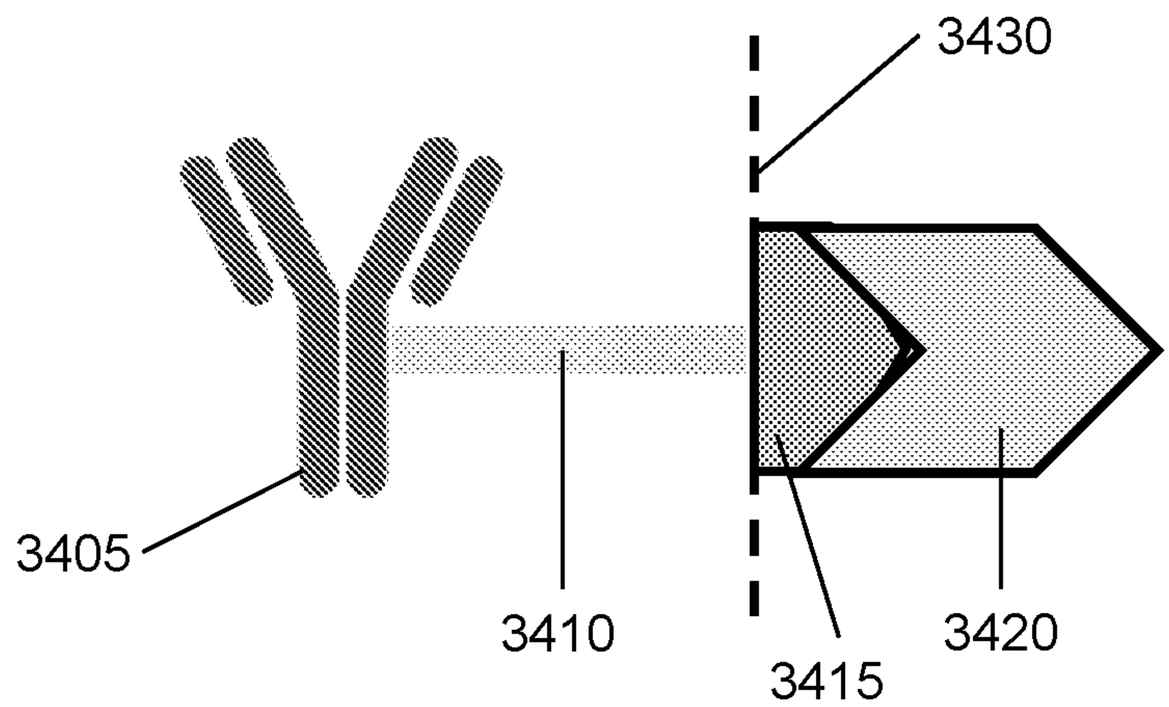


FIGURE 20C

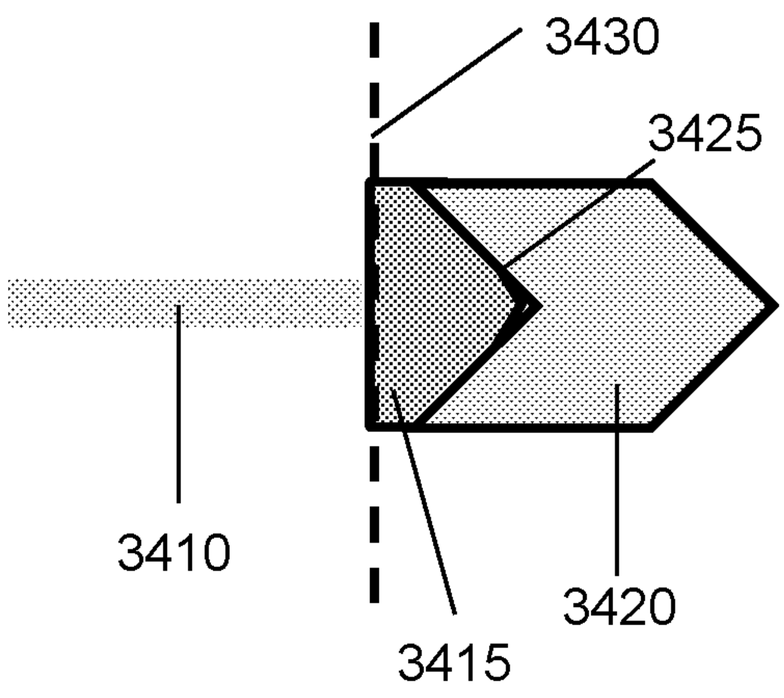


FIGURE 20D

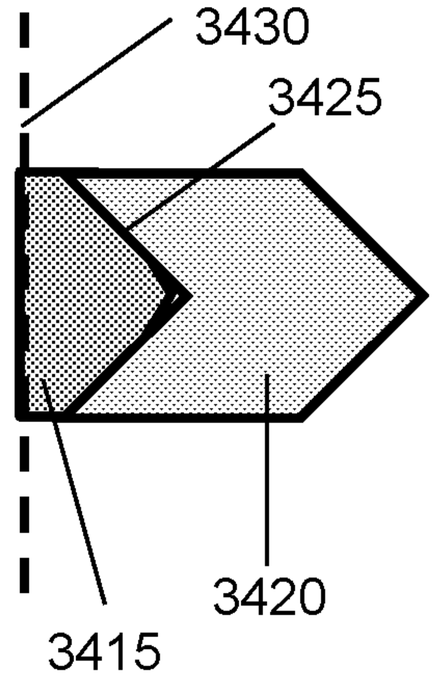


FIGURE 21A

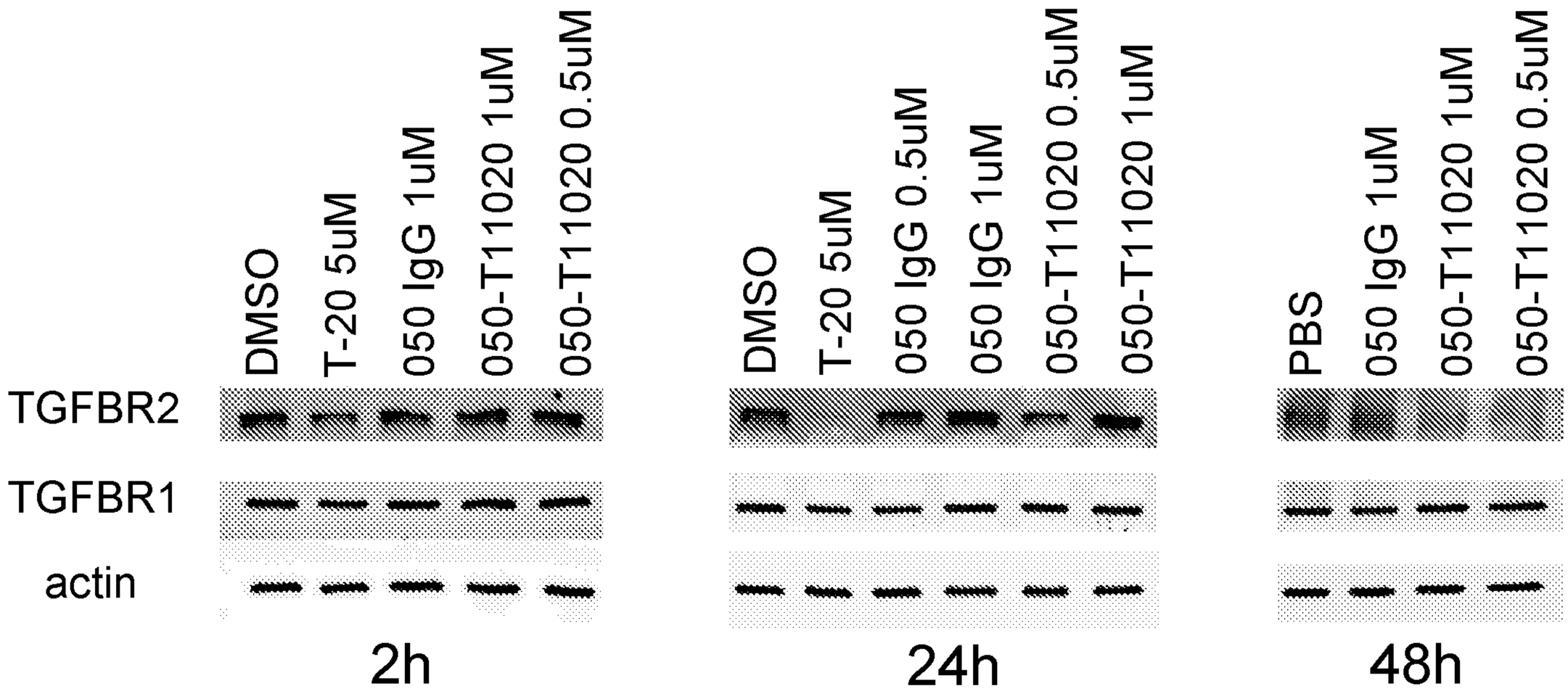


FIGURE 21B

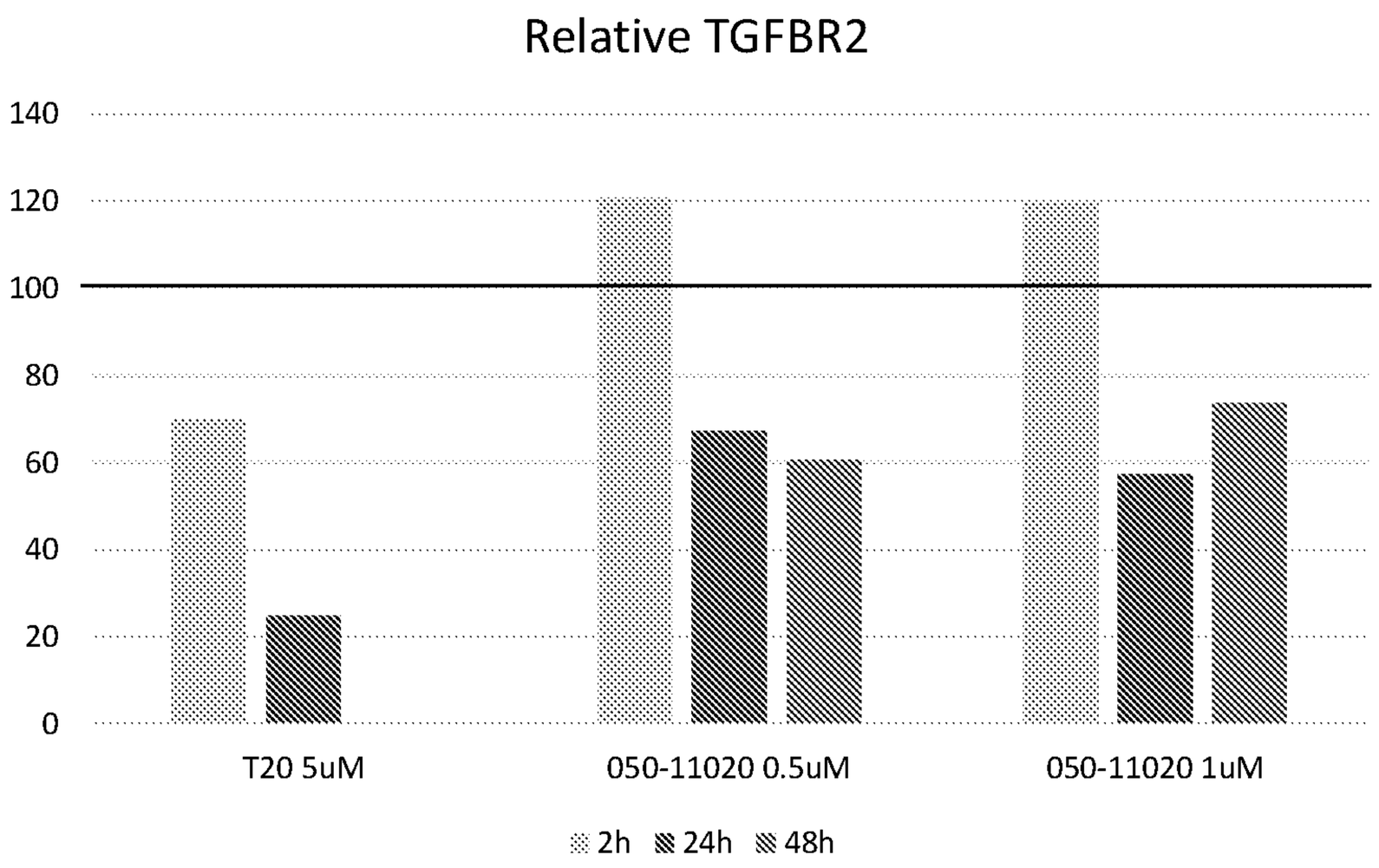


FIGURE 21C

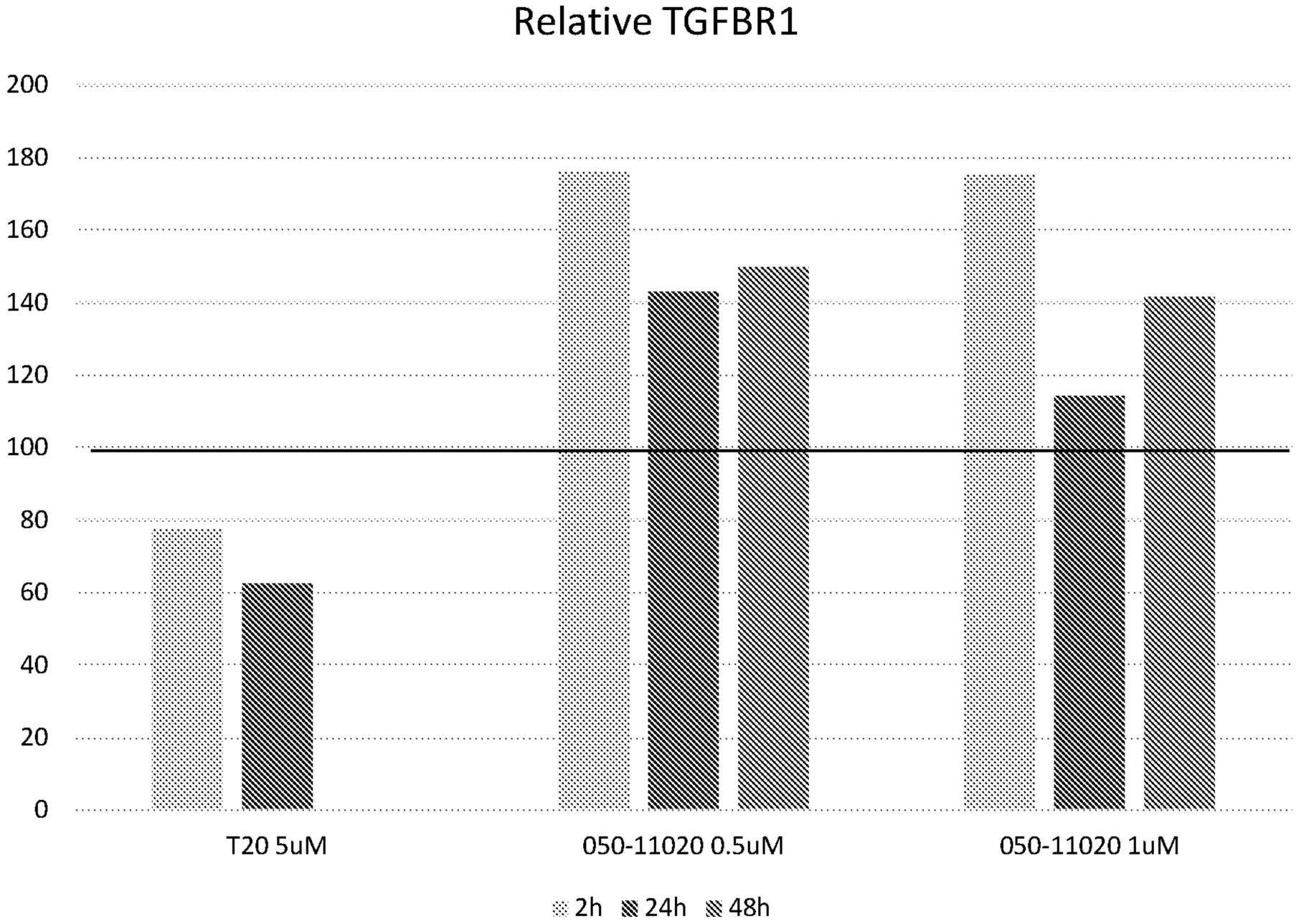

Relative TGFBR1
200
180
160
140
120
100
80
60
40
20
0
T20 5uM
050-11020 0.5uM
050-11020 1uM
2h
24h
48h

FIGURE 22A

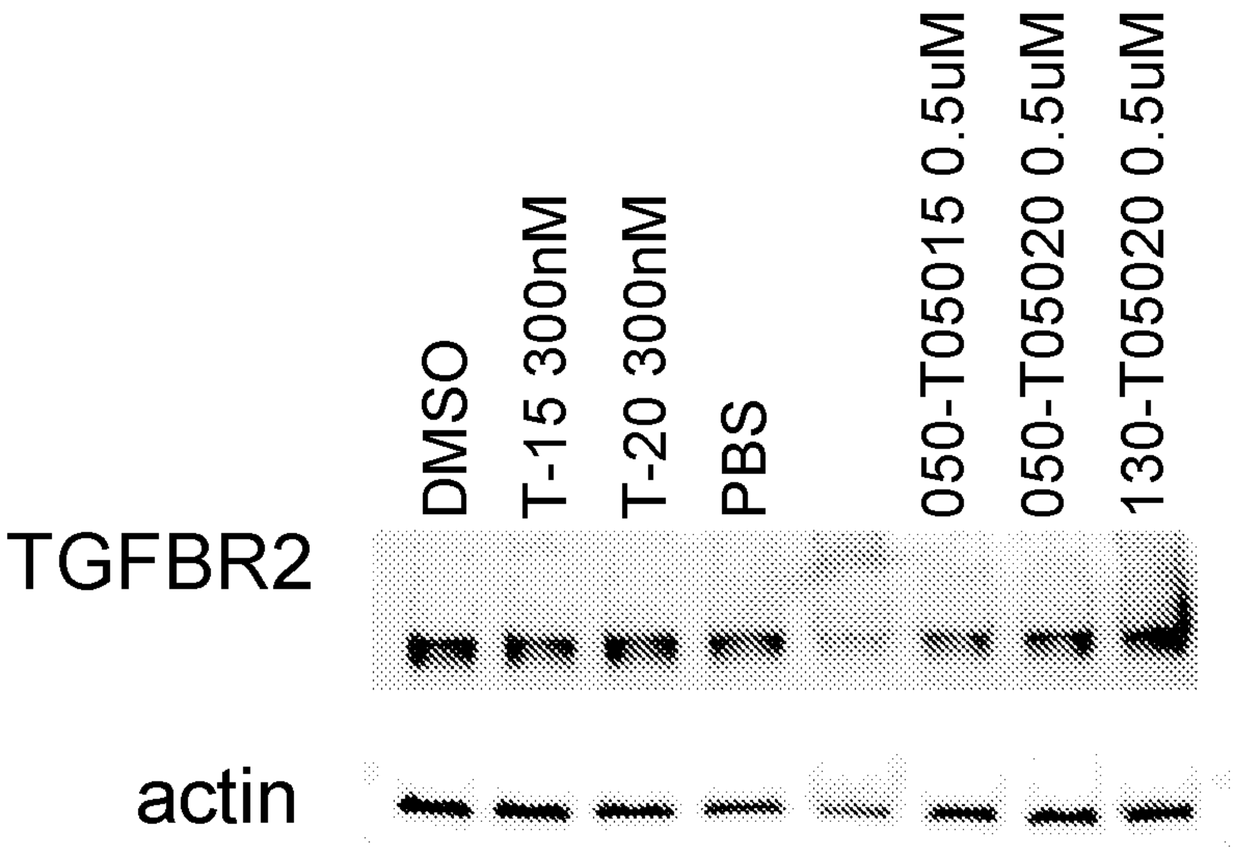


FIGURE 22B

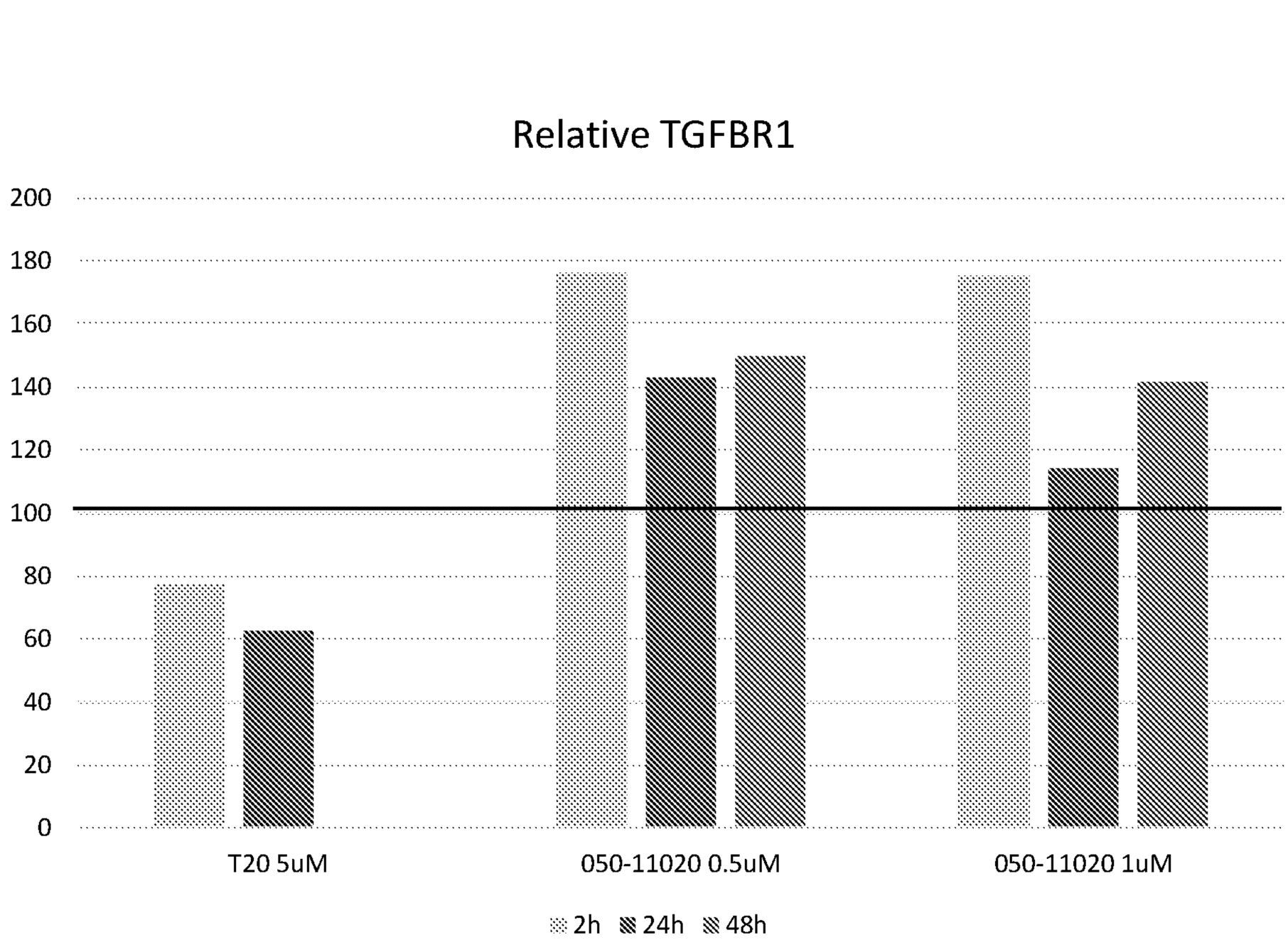


FIGURE 23A

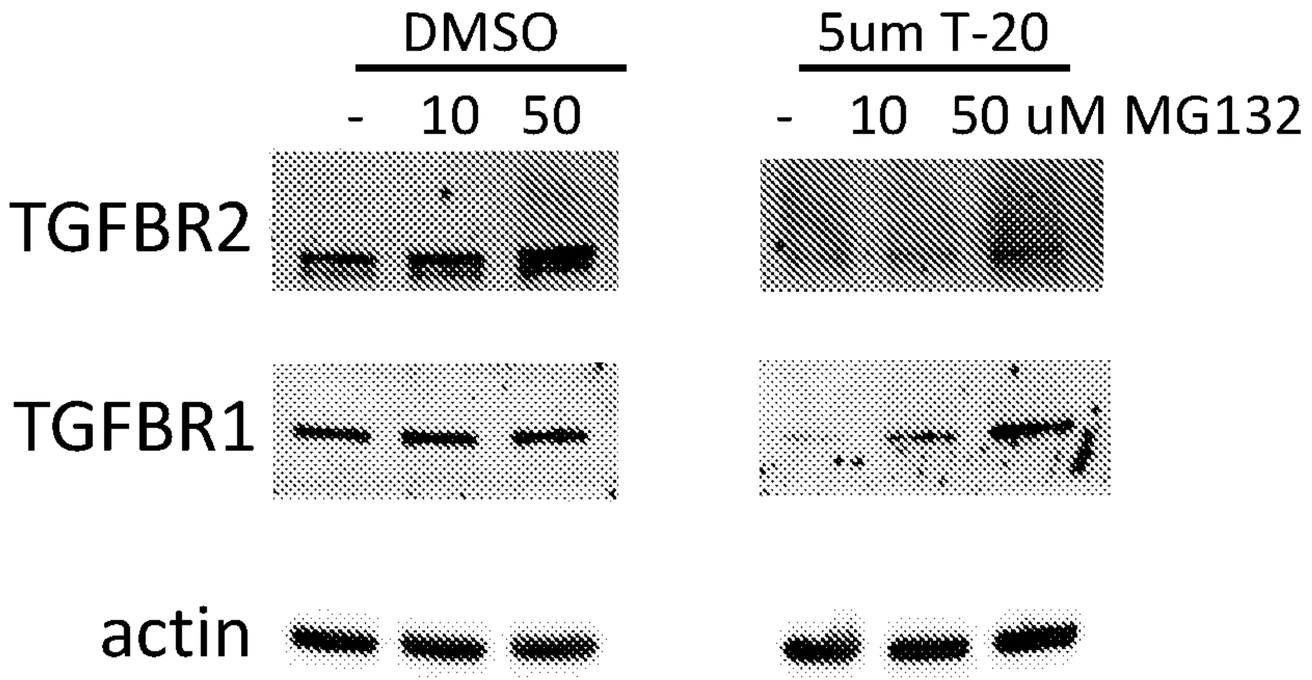
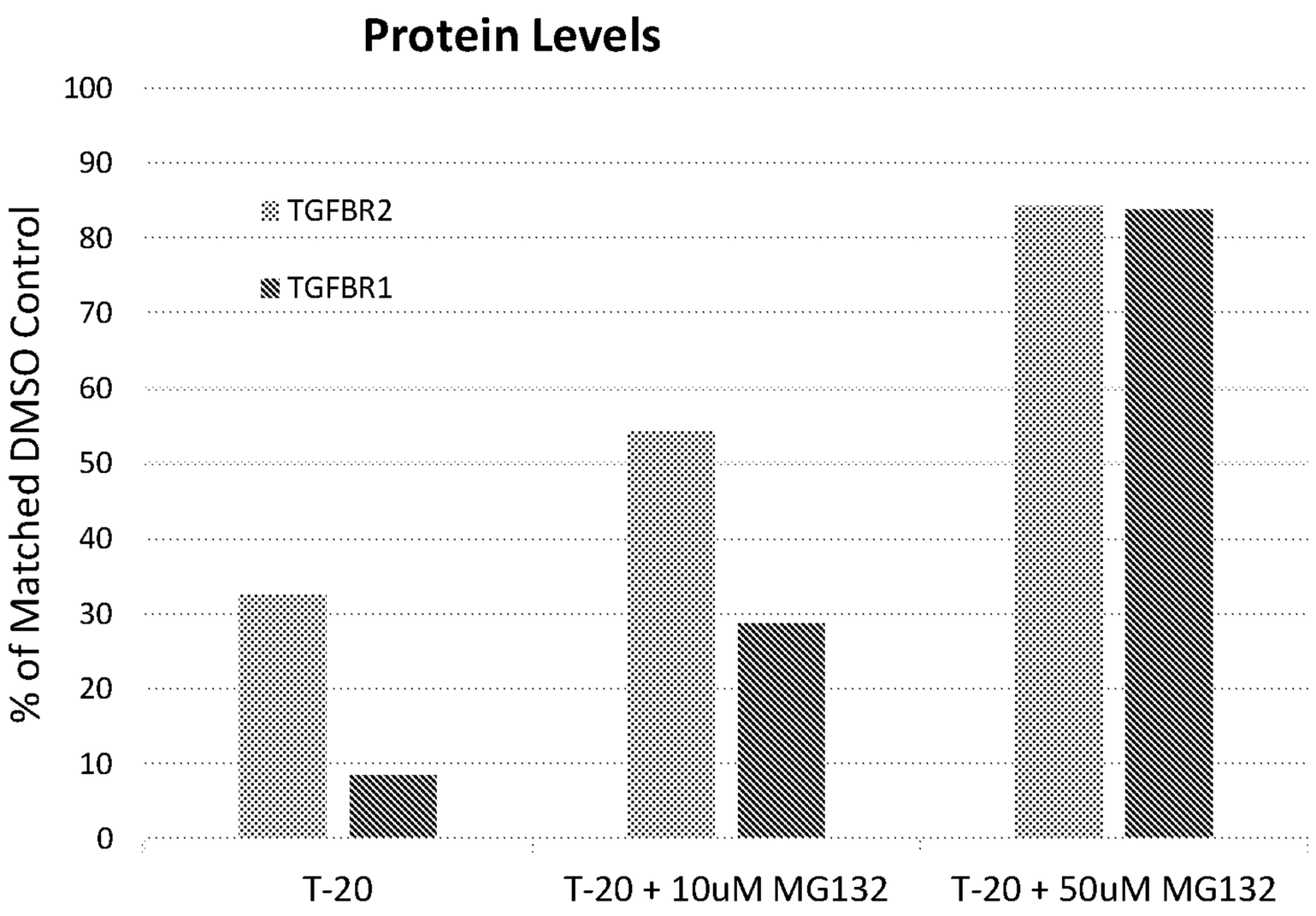


FIGURE 23B



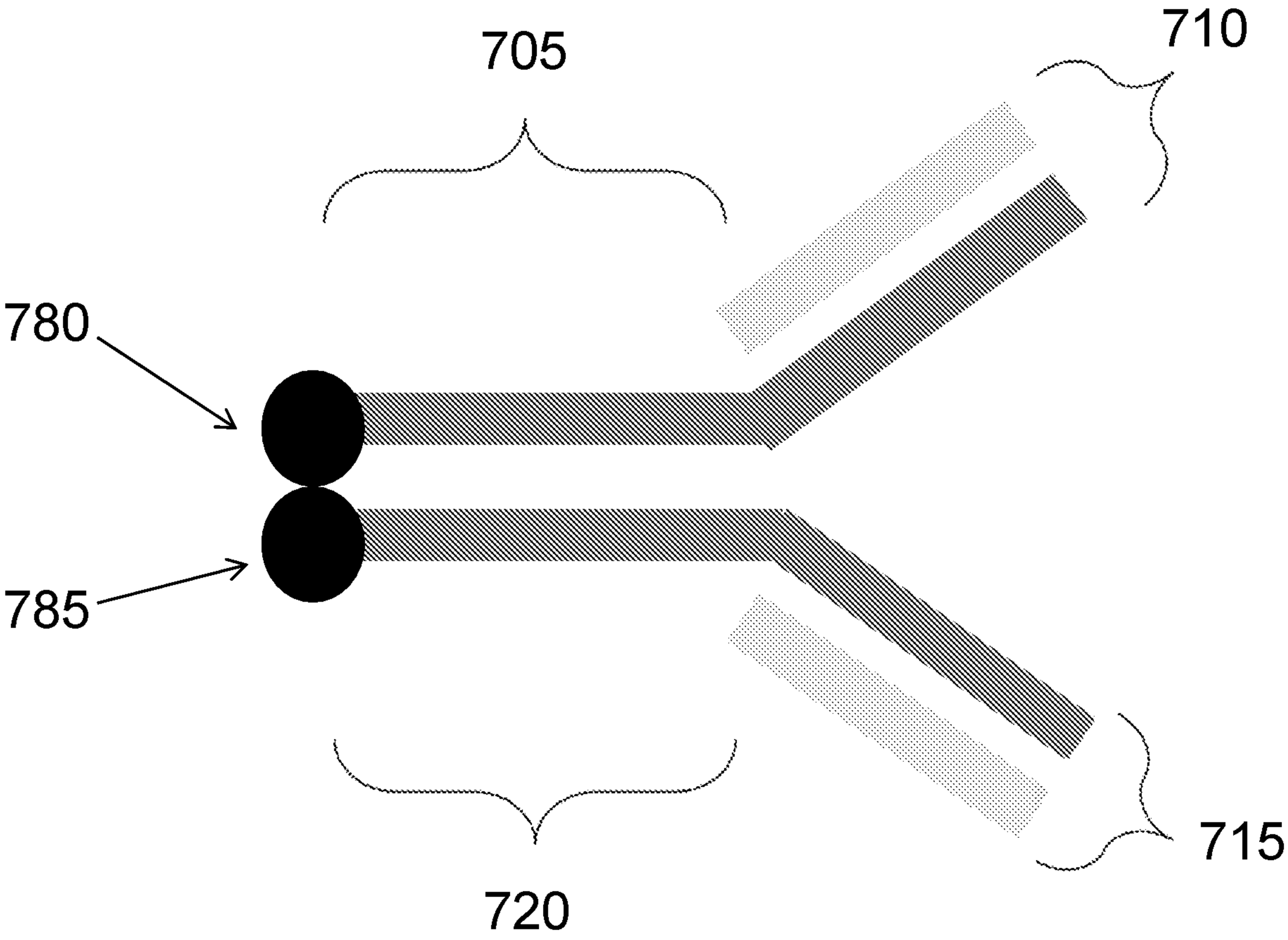


FIGURE 1