

[0005] GIPR knockout mice (Gipr^{-/-}) are resistant to high fat diet-induced weight gain and have improved insulin sensitivity and lipid profiles. (Yamada et al., Diabetes. 2006, 55:S86; Miyawaki et al. Nature Med. 2002, 8:738-742). In addition, a novel small molecule GIPR antagonist SKL-14959 prevents obesity and insulin resistance. (Diabetologia 2008, 51:S373, 44th EASD Annual meeting poster).

[0006] Glucagon-like peptide-1 (“GLP-1”) is a 31-amino acid peptide derived from the proglucagon gene. It is secreted by intestinal L-cells and released in response to food ingestion to induce insulin secretion from pancreatic β - cells (Diabetes 2004, 53:S3, 205-214). In addition to the incretin effects, GLP-1 also decreases glucagon secretion, delays gastric emptying and reduces caloric intake (Diabetes Care, 2003, 26(10): 2929-2940). GLP-1 exerts its effects by activation of the GLP-1 receptor, which belongs to a class B G-protein-coupled receptor (Endocrinology. 1993, 133(4):1907-10). The function of GLP-1 is limited by rapid degradation by the DPP-IV enzyme, resulting in a half-life of approximately 2 minutes. Recently, long-lasting GLP-1 receptor agonists such as exenatide, liraglutide, dulaglutide have been developed and are now being used clinically to improve glycemic control in patients with type 2 diabetes. Furthermore, GLP-1 receptor agonists also promote body weight reduction as well as reduction in blood pressure and plasma cholesterol levels in patients (Bioorg. Med. Chem.Lett 2013, 23:4011-4018).

[0007] Collectively, these links to obesity and insulin resistance imply GIPR inhibition is a useful approach for therapeutic intervention, both as a monotherapy and in combination with GLP-1.

SUMMARY

[0008] In one aspect, the present disclosure refers to the use of an antigen binding protein that specifically binds to a protein having an amino acid sequence having at least 90% amino acid sequence identity to an amino acid sequence of a GIPR in the manufacture of a medicament for treating a subject with a metabolic disorder, comprising that a therapeutically effective amount of the antigen binding protein is to be administered to said subject. In another aspect, the present disclosure refers to an isolated antigen binding protein that specifically binds to a human gastric inhibitory peptide receptor (GIPR) polypeptide. In another aspect, the present disclosure refers to a nucleic acid molecule encoding the antibody or fragment thereof as described herein.

[0008a] In yet another aspect, the present disclosure refers to a vector comprising a nucleic acid molecule as described herein. In yet another aspect, the present disclosure refers to a host cell comprising the nucleic acid molecule as described herein. In yet another aspect, the present disclosure refers to an antibody or fragment thereof produced by the host cell as described herein. In still another aspect, the present disclosure refers to a method of making the antibody or fragment thereof as described herein, comprising the step of preparing said antibody or fragment thereof from a host cell that secretes said antibody.

[0008b] In still another aspect, the present disclosure refers to a pharmaceutical composition comprising at least one antibody or fragment thereof as described herein, and pharmaceutically acceptable excipient. In still another aspect, the present disclosure refers to an isolated antigen binding protein that competes for binding to the extracellular portion of human GIPR with an antibody or fragment thereof as described herein. In still another aspect, the present disclosure refers to a composition comprising a therapeutically effective amount of a GLP-1 receptor agonist and a therapeutically effective amount of a GIPR antagonist that specifically binds to a protein having an amino acid sequence having at least 90% amino acid sequence identity to an amino acid sequence of a GIPR.

[0008c] In one example, the present disclosure provides a method of treating a subject with a metabolic disorder, the method comprising administering to the subject a therapeutically effective amount of an antigen binding protein that specifically binds to a protein having an amino acid sequence having at least 90% amino acid sequence identity to an amino acid sequence of a GIPR. In one example the present disclosure is directed to a method of treating a subject with a metabolic disorder, the method comprising administering to the subject a therapeutically effective amount of a GLP-1 receptor agonist and a therapeutically effective amount of a GIPR antagonist that specifically binds to a protein having an amino acid sequence having at least 90% amino acid sequence identity to an amino acid sequence of a GIPR. In one example, the metabolic disorder is a disorder of glucose metabolism. In another example, the glucose metabolism disorder comprises hyperglycemia and administering the antigen binding protein reduces plasma glucose. In another example, the glucose metabolism disorder comprises hyperinsulinemia and administering the antigen binding protein reduces plasma insulin. In another example, the glucose metabolism disorder comprises glucose intolerance and administering the antigen binding protein reduces increases glucose tolerance. In another example, the glucose metabolism disorder comprises insulin resistance and administering the antigen binding protein reduces insulin resistance. In another example,

the glucose metabolism disorder comprises diabetes mellitus. In another example, the subject is obese. In another example, administering the antigen binding protein reduces body weight in an obese subject. In another example, administering the antigen binding protein reduces body weight gain in an obese subject. In another example, administering the antigen binding protein reduces fat mass in an obese subject. In another example, the glucose metabolism disorder comprises insulin resistance and administering the antigen binding protein reduces insulin resistance in an obese subject. In another example, administering the antigen binding protein reduces liver steatosis in an obese subject having increased liver steatosis. In another example, administering the antigen binding protein reduces liver fat content in an obese subject having increased liver fat content.

[0009] In one example the present disclosure is directed to a method of treatment comprising administering to a subject a therapeutically effective amount of at least one GLP-1 receptor agonist in combination with administration of at least one GIPR antagonist which upon administration to a subject with symptoms of a metabolic disorder provides sustained beneficial effects.

[0010] In one example, administration of at least one GLP-1 receptor agonist in combination with administration of at least one GIPR antagonist provides sustained beneficial effects of at least one symptom of a metabolic disorder.

[0011] In one example, the therapeutically effective amounts of the GLP-1 receptor agonist and the GIPR antagonist are combined prior to administration to the subject.

[0012] In one example, the therapeutically effective amounts of the GLP-1 receptor agonist and the GIPR antagonist are administered to the subject sequentially.

[0013] In one example, the therapeutically effective amounts of a GLP-1 receptor agonist and a GIPR antagonist are synergistically effective amounts.

[0014] In one example, the molar ratio of a GLP-1 receptor agonist to a GIPR antagonist is from about 1:1 to 1:110, 1:1 to 1:100, 1:1 to 1:75, 1:1 to 1:50, 1:1 to 1:25, 1:1 to 1:10, 1:1 to 1:5, and 1:1. In one example, the molar ratio of a GIPR antagonist to a GLP-1 receptor agonist is from about 1:1 to 1:110, 1:1 to 1:100, 1:1 to 1:75, 1:1 to 1:50, 1:1 to 1:25, 1:1 to 1:10, and 1:1 to 1:5.

[0015] In one example, the GLP-1 receptor agonist is used in combination with the GIPR antagonist at therapeutically effective molar ratios of between about 1:1.5 to 1:150, preferably 1:2 to 1:50.

[0016] In one example, the GLP-1 receptor agonist and the GIPR antagonist are present in doses that are at least about 1.1 to 1.4, 1.5, 2, 3, 4, 5, 6, 7, 8, 9, or 10 fold lower than the doses of each compound alone required to treat a condition and/or disease.

[0017] In one example, the GLP-1 receptor agonist is GLP-1(7-37) or a GLP-1(7-37) analog.

[0018] In one example, the GLP-1 receptor agonist is selected from the group consisting of exenatide, liraglutide, lixisenatide, albiglutide, dulaglutide, semaglutide, and taspoglutide.

[0019] In one example, the GLP-1 receptor agonist is selected from the group consisting of GLP-1(7-37) (SEQ ID NO: 1244); GLP-1(7-36)-NH₂ (SEQ ID NO: 1245); liraglutide;

albiglutide; taspoglutide; dulaglutide, semaglutide; LY2428757; desamino-

His⁷,Arg²⁶,Lys³⁴(N^ε-(γ-Glu(N-α-hexadecanoyl)))-GLP-1(7-37) (core peptide disclosed as SEQ ID NO: 1282); desamino-His⁷,Arg²⁶,Lys³⁴(N^ε-octanoyl)-GLP-1(7-37) (SEQ ID NO:

1283); Arg^{26,34},Lys³⁸(N^ε-(ω-carboxypentadecanoyl))-GLP-1(7-38) (SEQ ID NO: 1284);

Arg^{26,34},Lys³⁶(N^ε-(γ-Glu(N-α-hexadecanoyl)))-GLP-1(7-36) (core peptide disclosed as SEQ ID NO: 1285); Aib^{8,35},Arg^{26,34},Phe³¹-GLP-1(7-36)) (SEQ ID NO: 1246);

HXaa₈EGTFTSDVSSYLEXaa₂₂Xaa₂₃AAKEFIXaa₃₀WLXaa₃₃Xaa₃₄G Xaa₃₆Xaa₃₇; wherein

Xaa₃ is A, V, or G; Xaa₂₂ is G, K, or E; Xaa₂₃ is Q or K; Xaa₃₀ is A or E; Xaa₃₃ is V or K;

Xaa₃₄ is K, N, or R; Xaa₃₆ is R or G; and Xaa₃₇ is G, H, P, or absent (SEQ ID NO: 1247);

Arg³⁴-GLP-1(7-37) (SEQ ID NO: 1248); Glu³⁰-GLP-1(7-37) (SEQ ID NO: 1249); Lys²²-

GLP-1(7-37) (SEQ ID NO: 1250); Gly^{8,36},Glu²²-GLP-1(7-37) (SEQ ID NO: 1251);

Val⁸,Glu²²,Gly³⁶-GLP-1(7-37) (SEQ ID NO: 1252); Gly^{8,36},Glu²²,Lys³³,Asn³⁴-GLP-1(7-37)

(SEQ ID NO: 1253); Val⁸,Glu²²,Lys³³,Asn³⁴,Gly³⁶-GLP-1(7-37) (SEQ ID NO: 1254);

Gly^{8,36},Glu²²,Pro³⁷-GLP-1(7-37) (SEQ ID NO: 1255); Val⁸,Glu²²,Gly³⁶Pro³⁷-GLP-1(7-37)

(SEQ ID NO: 1256); Gly^{8,36},Glu²²,Lys³³, Asn³⁴,Pro³⁷-GLP-1(7-37) (SEQ ID NO: 1257);

Val⁸,Glu²²,Lys³³,Asn³⁴,Gly³⁶,Pro³⁷-GLP-1(7-37) (SEQ ID NO: 1258); Gly^{8,36},Glu²²-GLP-1(7-

36) (SEQ ID NO: 1259); Val⁸,Glu²²,Gly³⁶-GLP-1(7-36) (SEQ ID NO: 1260);

Val⁸,Glu²²,Asn³⁴,Gly³⁶-GLP-1(7-36) (SEQ ID NO: 1261); and Gly^{8,36},Glu²²,Asn³⁴-GLP-1(7-

36) (SEQ ID NO: 1262).

[0020] In another example, the subject is a mammal. In another example, the subject is human. In another example, the GIPR is human GIPR. In another example, the administering is by parenteral injection. In another example, the administering is by subcutaneous injection.

[0021] In another example the present disclosure provides an antigen binding protein that specifically binds to a human GIPR polypeptide and inhibits activation of GIPR by GIP ligand. In one example, the antigen binding protein inhibits GIP ligand binding to GIPR. In another example, the antigen binding protein is a human antigen binding protein. In another

example, the antigen binding protein is a human antibody. In another example, the antigen binding protein is a monoclonal antibody.

[0022] In another example, the present disclosure provides a pharmaceutical composition comprising at least one antigen binding protein according to any one of the foregoing examples.

[0023] In another example, the present disclosure provides a nucleic acid molecule encoding an antigen binding protein according to any one of the foregoing examples.

[0024] In another example, the present disclosure provides a vector comprising a nucleic acid molecule encoding an antigen binding protein according to any one of the foregoing examples.

[0025] In another example, the present disclosure provides a host cell comprising a nucleic acid molecule encoding an antigen binding protein according to any one of the foregoing examples or a vector comprising a nucleic acid molecule encoding an antigen binding protein according to any one of the foregoing examples. In another example the present disclosure provides an antigen binding protein that specifically binds to a human GIPR polypeptide expressed by the vector.

[0026] In another example, the present disclosure provides a method of making an antigen binding protein according to any one of the foregoing examples, the method comprising expressing the antigen binding protein in a host cell that secretes the antigen binding protein, and then purifying the antigen binding protein from the cell culture media. In another example the present disclosure provides an antigen binding protein that specifically binds to a human GIPR polypeptide purified from the host cell.

[0027] In another example, the present disclosure provides an antigen binding protein of any one of the foregoing examples or a pharmaceutical composition of any one of the foregoing examples for use in therapy.

CLAIMS

What is claimed is:

1. Use of an antigen binding protein that specifically binds to a protein having an amino acid sequence having at least 90% amino acid sequence identity to an amino acid sequence of a GIPR in the manufacture of a medicament for treating a subject with a metabolic disorder, comprising that a therapeutically effective amount of the antigen binding protein is to be administered to said subject.
2. The use of claim 1, wherein said metabolic disorder is a disorder of glucose metabolism.
3. The use of claim 2, wherein said glucose metabolism disorder comprises hyperglycemia and wherein said administration reduces plasma glucose in said subject.
4. The use of claim 2, wherein said glucose metabolism disorder comprises hyperinsulinemia and wherein said administration reduces plasma insulin in said subject.
5. The use of claim 2, wherein said glucose metabolism disorder comprises glucose intolerance and wherein said administration increases glucose tolerance in said subject.
6. The use of claim 2, wherein said glucose metabolism disorder comprises insulin resistance and wherein said administration decreases insulin resistance in said subject.
7. The use of claim 2, wherein said glucose metabolism disorder comprises diabetes mellitus.
8. The use of claim 2, wherein said subject is obese.
9. The use of claim 8, wherein said administration reduces body weight in said subject.
10. The use of claim 8, wherein said administration reduces body weight gain in said subject.
11. The method of claim 8, where said administration reduces fat mass in said subject.

12. The use of claim 8, wherein said glucose metabolism disorder comprises insulin resistance and wherein said administration reduces insulin resistance in said subject.
13. The use of claim 8, where said subject has increased liver steatosis, and wherein said administration reduces liver steatosis in said subject.
14. The method of claim 8, where said subject has increased liver fat content, and wherein said administration reduces liver fat content in said subject.
15. The use of claim 1, wherein said subject is a mammal.
16. The use of claim 1, wherein said subject is human.
17. The use of claim 1, wherein said administration is by parenteral injection.
18. The use of claim 1, wherein said administration is by subcutaneous injection.
19. An isolated antigen binding protein that specifically binds to a human gastric inhibitory peptide receptor (GIPR) polypeptide.
20. The isolated antigen binding protein of claim 19, wherein said human GIPR has a sequence comprising a sequence selected from the group consisting of SEQ ID NO: 1201, SEQ ID NO: 1203, and SEQ ID NO: 1205.
21. The isolated antigen binding protein of claim 20, wherein said antigen binding protein is a monoclonal antibody, a polyclonal antibody, a recombinant antibody, a human antibody, a humanized antibody, a chimeric antibody, a multispecific antibody, or an antibody fragment thereof.
22. The isolated antigen binding protein of claim 21, wherein said antibody fragment is a Fab fragment, a Fab' fragment, or a F(ab')₂ fragment.
23. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is a human antibody.
24. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is a monoclonal antibody.
25. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is of the IgG1-, IgG2- IgG3- or IgG4-type.

26. The isolated antigen binding protein of claim 25, wherein said antigen binding protein is of the IgG1- or the IgG2-type.

27. The isolated antigen binding protein of any of claim 21, wherein said antigen binding protein is coupled to a labeling group.

28. The isolated antigen binding protein of one of claim 21, wherein said antigen binding protein inhibits binding of GIP to the extracellular portion of human GIPR.

29. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is an antibody or a fragment thereof, and wherein said antibody comprises a CDRL1, a CDRL2, a CDRL3, a CDRH1, a CDRH2, and a CDRH3, wherein said CDRL1 comprises a sequence selected from the group consisting of SEQ ID NOs: 4, 10, 16, 22, 28, 34, 40, 46, 52, 58, 64, 70, 76, 82, 88, 94, 100, 106, 112, 118, 124, 130, 136, 142, 148, 154, 160, 166, 172, 178, 184, 190, 196, 202, 208, 214, 220, 226, 232, 238, 244, 250, 256, 262, 268, 274, 280, 286, 292, 298, 304, 310, 316, 322, 328, 334, 340, 346, 352, 358, 1290, 1300, 1310, 1320, 1330, 1340, and 1350; said CDRL2 comprises a sequence selected from the group consisting of SEQ ID NOs: 5, 11, 17, 23, 29, 35, 41, 47, 53, 59, 65, 71, 77, 83, 89, 95, 101, 107, 113, 119, 125, 131, 137, 143, 149, 155, 161, 167, 173, 179, 185, 191, 197, 203, 209, 215, 221, 227, 233, 239, 245, 251, 257, 263, 269, 275, 281, 287, 293, 299, 305, 311, 317, 323, 329, 335, 341, 347, 353, 359, 1291, 1301, 1311, 1321, 1331, 1341, and 1351; said CDRL3 comprises a sequence selected from the group consisting of SEQ ID NOs: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120, 126, 132, 138, 144, 150, 156, 162, 168, 174, 180, 186, 192, 198, 204, 210, 216, 222, 228, 234, 240, 246, 252, 258, 264, 270, 276, 282, 288, 294, 300, 306, 312, 318, 324, 330, 336, 342, 348, 354, 360, 1292, 1302, 1312, 1322, 1332, 1342, and 1352; said CDRH1 comprises a sequence selected from the group consisting of SEQ ID NOs: 364, 370, 376, 382, 388, 394, 400, 406, 412, 418, 424, 430, 436, 442, 448, 454, 460, 466, 472, 478, 484, 490, 496, 502, 508, 514, 520, 526, 532, 538, 544, 550, 556, 562, 568, 574, 580, 586, 592, 598, 604, 610, 616, 622, 628, 634, 640, 646, 652, 658, 664, 670, 676, 682, 688, 694, 700, 706, 712, 718, 1293, 1303, 1313, 1323, 1333, 1343, and 1353; said CDRH2 comprises a sequence selected from the group consisting of SEQ ID NOs: 365, 371, 377, 383, 389, 395, 401, 407, 413, 419, 425, 431, 437, 443, 449, 455, 461, 467, 473, 479, 485, 491, 497, 503, 509, 515, 521, 527, 533, 539, 545, 551, 557, 563, 569, 575, 581, 587, 593, 599, 605, 611, 617, 623, 629, 635, 641, 647, 653, 659, 665, 671, 677, 683, 689, 695, 701, 707, 713, 719, 1294, 1304, 1314, 1324, 1334, 1344, and 1354; and

said CDRH3 comprises a sequence selected from the group consisting of SEQ ID NOs: 366, 372, 378, 384, 390, 396, 402, 408, 414, 420, 426, 432, 438, 444, 450, 456, 462, 468, 474, 480, 486, 492, 498, 504, 510, 516, 522, 528, 534, 540, 546, 552, 558, 564, 570, 576, 582, 588, 594, 600, 606, 612, 618, 624, 630, 636, 642, 648, 654, 660, 666, 672, 678, 684, 690, 696, 702, 708, 714, 720, 1295, 1305, 1315, 1325, 1335, 1345, and 1355.

30. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is an antibody or a fragment thereof, and wherein said antibody comprises a CDRL1, a CDRL2, a CDRL3, a CDRH1, a CDRH2, and a CDRH3, wherein each CDRL1, CDRL2, CDRL3, CDRH1, CDRH2, and CDRH3, respectively, comprises a sequence selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 364, SEQ ID NO: 365, and SEQ ID NO: 366; SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 370, SEQ ID NO: 371, and SEQ ID NO: 372; SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO: 376, SEQ ID NO: 377, and SEQ ID NO: 378; SEQ ID NO: 22, SEQ ID NO: 23, SEQ ID NO: 24, SEQ ID NO: 382, SEQ ID NO: 383, and SEQ ID NO: 384; SEQ ID NO: 28, SEQ ID NO: 29, SEQ ID NO: 30, SEQ ID NO: 388, SEQ ID NO: 389, and SEQ ID NO: 390; SEQ ID NO: 34, SEQ ID NO: 35, SEQ ID NO: 36, SEQ ID NO: 394, SEQ ID NO: 395, and SEQ ID NO: 396; SEQ ID NO: 40, SEQ ID NO: 41, SEQ ID NO: 42, SEQ ID NO: 400, SEQ ID NO: 401, and SEQ ID NO: 402; SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 406, SEQ ID NO: 407, and SEQ ID NO: 408; SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 412, SEQ ID NO: 413, and SEQ ID NO: 414; SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 418, SEQ ID NO: 419, and SEQ ID NO: 420; SEQ ID NO: 64, SEQ ID NO: 65, SEQ ID NO: 66, SEQ ID NO: 424, SEQ ID NO: 425, and SEQ ID NO: 426; SEQ ID NO: 70, SEQ ID NO: 71, SEQ ID NO: 72, SEQ ID NO: 430, SEQ ID NO: 431, and SEQ ID NO: 432; SEQ ID NO: 76, SEQ ID NO: 77, SEQ ID NO: 78, SEQ ID NO: 436, SEQ ID NO: 437, and SEQ ID NO: 438; SEQ ID NO: 82, SEQ ID NO: 83, SEQ ID NO: 84, SEQ ID NO: 442, SEQ ID NO: 443, and SEQ ID NO: 444; SEQ ID NO: 88, SEQ ID NO: 89, SEQ ID NO: 90, SEQ ID NO: 448, SEQ ID NO: 449, and SEQ ID NO: 450; SEQ ID NO: 94, SEQ ID NO: 95, SEQ ID NO: 96, SEQ ID NO: 454, SEQ ID NO: 455, and SEQ ID NO: 456; SEQ ID NO: 100, SEQ ID NO: 101, SEQ ID NO: 102, SEQ ID NO: 460, SEQ ID NO: 461, and SEQ ID NO: 462; SEQ ID NO: 106, SEQ ID NO: 107, SEQ ID NO: 108, SEQ ID NO: 466, SEQ ID NO: 467, and SEQ ID NO: 468; SEQ ID NO: 112, SEQ ID NO: 113, SEQ ID NO: 114, SEQ ID NO: 472, SEQ ID NO: 473, and SEQ ID NO: 474; SEQ ID NO: 118, SEQ ID NO: 119, SEQ ID NO: 120, SEQ ID NO: 478, SEQ ID NO: 479, and SEQ ID NO: 480; SEQ ID NO: 124, SEQ ID NO: 125, SEQ ID NO: 126, SEQ ID

NO: 484, SEQ ID NO: 485, and SEQ ID NO: 486; SEQ ID NO: 130, SEQ ID NO: 131, SEQ ID NO: 132, SEQ ID NO: 490, SEQ ID NO: 491, and SEQ ID NO: 492; SEQ ID NO: 136, SEQ ID NO: 137, SEQ ID NO: 138, SEQ ID NO: 496, SEQ ID NO: 497, and SEQ ID NO: 498; SEQ ID NO: 142, SEQ ID NO: 143, SEQ ID NO: 144, SEQ ID NO: 502, SEQ ID NO: 503, and SEQ ID NO: 504; SEQ ID NO: 148, SEQ ID NO: 149, SEQ ID NO: 150, SEQ ID NO: 508, SEQ ID NO: 509, and SEQ ID NO: 510; SEQ ID NO: 154, SEQ ID NO: 155, SEQ ID NO: 156, SEQ ID NO: 514, SEQ ID NO: 515, and SEQ ID NO: 516; SEQ ID NO: 160, SEQ ID NO: 161, SEQ ID NO: 162, SEQ ID NO: 520, SEQ ID NO: 521, and SEQ ID NO: 522; SEQ ID NO: 166, SEQ ID NO: 167, SEQ ID NO: 168, SEQ ID NO: 526, SEQ ID NO: 527, and SEQ ID NO: 528; SEQ ID NO: 172, SEQ ID NO: 173, SEQ ID NO: 174, SEQ ID NO: 532, SEQ ID NO: 533, and SEQ ID NO: 534; SEQ ID NO: 178, SEQ ID NO: 179, SEQ ID NO: 180, SEQ ID NO: 538, SEQ ID NO: 539, and SEQ ID NO: 540; SEQ ID NO: 184, SEQ ID NO: 185, SEQ ID NO: 186, SEQ ID NO: 544, SEQ ID NO: 545, and SEQ ID NO: 546; SEQ ID NO: 190, SEQ ID NO: 191, SEQ ID NO: 192, SEQ ID NO: 550, SEQ ID NO: 551, and SEQ ID NO: 552; SEQ ID NO: 196, SEQ ID NO: 197, SEQ ID NO: 198, SEQ ID NO: 556, SEQ ID NO: 557, and SEQ ID NO: 558; SEQ ID NO: 202, SEQ ID NO: 203, SEQ ID NO: 204, SEQ ID NO: 562, SEQ ID NO: 563, and SEQ ID NO: 564; SEQ ID NO: 208, SEQ ID NO: 209, SEQ ID NO: 210, SEQ ID NO: 568, SEQ ID NO: 569, and SEQ ID NO: 570; SEQ ID NO: 214, SEQ ID NO: 215, SEQ ID NO: 216, SEQ ID NO: 574, SEQ ID NO: 575, and SEQ ID NO: 576; SEQ ID NO: 220, SEQ ID NO: 221, SEQ ID NO: 222, SEQ ID NO: 580, SEQ ID NO: 581, and SEQ ID NO: 582; SEQ ID NO: 226, SEQ ID NO: 227, SEQ ID NO: 228, SEQ ID NO: 586, SEQ ID NO: 587, and SEQ ID NO: 588; SEQ ID NO: 232, SEQ ID NO: 233, SEQ ID NO: 234, SEQ ID NO: 592, SEQ ID NO: 593, and SEQ ID NO: 594; SEQ ID NO: 238, SEQ ID NO: 239, SEQ ID NO: 240, SEQ ID NO: 598, SEQ ID NO: 599, and SEQ ID NO: 600; SEQ ID NO: 244, SEQ ID NO: 245, SEQ ID NO: 246, SEQ ID NO: 604, SEQ ID NO: 605, and SEQ ID NO: 606; SEQ ID NO: 250, SEQ ID NO: 251, SEQ ID NO: 252, SEQ ID NO: 610, SEQ ID NO: 611, and SEQ ID NO: 612; SEQ ID NO: 256, SEQ ID NO: 257, SEQ ID NO: 258, SEQ ID NO: 616, SEQ ID NO: 617, and SEQ ID NO: 618; SEQ ID NO: 262, SEQ ID NO: 263, SEQ ID NO: 264, SEQ ID NO: 622, SEQ ID NO: 623, and SEQ ID NO: 624; SEQ ID NO: 268, SEQ ID NO: 269, SEQ ID NO: 270, SEQ ID NO: 628, SEQ ID NO: 629, and SEQ ID NO: 630; SEQ ID NO: 274, SEQ ID NO: 275, SEQ ID NO: 276, SEQ ID NO: 634, SEQ ID NO: 635, and SEQ ID NO: 636; SEQ ID NO: 280, SEQ ID NO: 281, SEQ ID NO: 282, SEQ ID NO: 640, SEQ ID NO: 641, and SEQ ID NO: 642; SEQ ID NO: 286, SEQ ID NO: 287, SEQ ID NO: 288, SEQ ID NO: 646, SEQ ID NO:

647, and SEQ ID NO: 648; SEQ ID NO: 292, SEQ ID NO: 293, SEQ ID NO: 294, SEQ ID NO: 652, SEQ ID NO: 653, and SEQ ID NO: 654; SEQ ID NO: 298, SEQ ID NO: 299, SEQ ID NO: 300, SEQ ID NO: 658, SEQ ID NO: 659, and SEQ ID NO: 660; SEQ ID NO: 304, SEQ ID NO: 305, SEQ ID NO: 306, SEQ ID NO: 664, SEQ ID NO: 665, and SEQ ID NO: 666; SEQ ID NO: 310, SEQ ID NO: 311, SEQ ID NO: 312, SEQ ID NO: 670, SEQ ID NO: 671, and SEQ ID NO: 672; SEQ ID NO: 316, SEQ ID NO: 317, SEQ ID NO: 318, SEQ ID NO: 676, SEQ ID NO: 677, and SEQ ID NO: 678; SEQ ID NO: 322, SEQ ID NO: 323, SEQ ID NO: 324, SEQ ID NO: 682, SEQ ID NO: 683, and SEQ ID NO: 684; SEQ ID NO: 328, SEQ ID NO: 329, SEQ ID NO: 330, SEQ ID NO: 688, SEQ ID NO: 689, and SEQ ID NO: 690; SEQ ID NO: 334, SEQ ID NO: 335, SEQ ID NO: 336, SEQ ID NO: 694, SEQ ID NO: 695, and SEQ ID NO: 696; SEQ ID NO: 340, SEQ ID NO: 341, SEQ ID NO: 342, SEQ ID NO: 700, SEQ ID NO: 701, and SEQ ID NO: 702; SEQ ID NO: 346, SEQ ID NO: 347, SEQ ID NO: 348, SEQ ID NO: 706, SEQ ID NO: 707, and SEQ ID NO: 708; SEQ ID NO: 352, SEQ ID NO: 353, SEQ ID NO: 354, SEQ ID NO: 712, SEQ ID NO: 713, and SEQ ID NO: 714; SEQ ID NO: 358, SEQ ID NO: 359, SEQ ID NO: 360, SEQ ID NO: 718, SEQ ID NO: 719, and SEQ ID NO: 720; SEQ ID NO: 1290, SEQ ID NO: 1291, SEQ ID NO: 1292, SEQ ID NO: 1293, SEQ ID NO: 1294, and SEQ ID NO: 1295; SEQ ID NO: 1300, SEQ ID NO: 1301, SEQ ID NO: 1302, SEQ ID NO: 1303, SEQ ID NO: 1304, and SEQ ID NO: 1305; SEQ ID NO: 1310, SEQ ID NO: 1311, SEQ ID NO: 1312, SEQ ID NO: 1313, SEQ ID NO: 1314, and SEQ ID NO: 1315; SEQ ID NO: 1320, SEQ ID NO: 1321, SEQ ID NO: 1322, SEQ ID NO: 1323, SEQ ID NO: 1324, and SEQ ID NO: 1325; SEQ ID NO: 1330, SEQ ID NO: 1331, SEQ ID NO: 1332, SEQ ID NO: 1333, SEQ ID NO: 1334, and SEQ ID NO: 1335; SEQ ID NO: 1340, SEQ ID NO: 1341, SEQ ID NO: 1342, SEQ ID NO: 1343, SEQ ID NO: 1344, and SEQ ID NO: 1345; SEQ ID NO: 1350, SEQ ID NO: 1351, SEQ ID NO: 1352, SEQ ID NO: 1353, SEQ ID NO: 1354, and SEQ ID NO: 1355; and SEQ ID NO: 1360, SEQ ID NO: 1361, SEQ ID NO: 1362, SEQ ID NO: 1363, SEQ ID NO: 1364, and SEQ ID NO: 1365.

31. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is an antibody or a fragment thereof, and wherein said antibody or fragment thereof comprises a light chain variable region comprising a sequence selected from the group consisting of SEQ ID NOs: 723, 727, 731, 735, 739, 743, 747, 751, 755, 759, 763, 767, 771, 775, 779, 783, 787, 791, 795, 799, 803, 807, 811, 815, 819, 823, 827, 831, 835, 839, 843, 847, 851, 855, 859, 863, 867, 871, 875, 879, 883, 887, 891, 895, 899, 903, 907, 911, 915, 919, 923, 927, 931, 935, 939, 943, 947, 951, 955, 959, 1286, 1296, 1306, 1316, 1326, 1336,

1346, and 1356 and a heavy chain variable region comprising a sequence selected from the group consisting of SEQ ID NOs: 724, 728, 732, 736, 740, 744, 748, 752, 756, 760, 764, 768, 772, 776, 780, 784, 788, 792, 796, 800, 804, 808, 812, 816, 820, 824, 828, 832, 836, 840, 844, 848, 852, 856, 860, 864, 868, 872, 876, 880, 884, 888, 892, 896, 900, 904, 908, 912, 916, 920, 924, 928, 932, 936, 940, 944, 948, 952, 956, 960, 1287, 1297, 1307, 1317, 1327, 1337, 1347, and 1357.

32. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is an antibody or a fragment thereof, and wherein said antibody or fragment thereof comprises a combination of a light chain variable region and a heavy chain variable region selected from the group consisting of a light chain variable region comprising SEQ ID NO: 723 and a heavy chain variable region comprising SEQ ID NO: 724; a light chain variable region comprising SEQ ID NO: 727 and a heavy chain variable region comprising SEQ ID NO: 728; a light chain variable region comprising SEQ ID NO: 731 and a heavy chain variable region comprising SEQ ID NO: 732; a light chain variable region comprising SEQ ID NO: 735 and a heavy chain variable region comprising SEQ ID NO: 736; a light chain variable region comprising SEQ ID NO: 739 and a heavy chain variable region comprising SEQ ID NO: 740; a light chain variable region comprising SEQ ID NO: 743 and a heavy chain variable region comprising SEQ ID NO: 744; a light chain variable region comprising SEQ ID NO: 747 and a heavy chain variable region comprising SEQ ID NO: 748; a light chain variable region comprising SEQ ID NO: 751 and a heavy chain variable region comprising SEQ ID NO: 752; a light chain variable region comprising SEQ ID NO: 755 and a heavy chain variable region comprising SEQ ID NO: 756; a light chain variable region comprising SEQ ID NO: 759 and a heavy chain variable region comprising SEQ ID NO: 760; a light chain variable region comprising SEQ ID NO: 763 and a heavy chain variable region comprising SEQ ID NO: 764; a light chain variable region comprising SEQ ID NO: 767 and a heavy chain variable region comprising SEQ ID NO: 768; a light chain variable region comprising SEQ ID NO: 771 and a heavy chain variable region comprising SEQ ID NO: 772; a light chain variable region comprising SEQ ID NO: 775 and a heavy chain variable region comprising SEQ ID NO: 776; a light chain variable region comprising SEQ ID NO: 779 and a heavy chain variable region comprising SEQ ID NO: 780; a light chain variable region comprising SEQ ID NO: 783 and a heavy chain variable region comprising SEQ ID NO: 784; a light chain variable region comprising SEQ ID NO: 787 and a heavy chain variable region comprising SEQ ID NO: 788; a light chain variable region comprising SEQ ID NO: 791 and a heavy chain variable region comprising SEQ ID NO: 792; a light chain variable region

33. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is an antibody, and wherein said antibody comprises a light chain comprising a sequence selected from the group consisting of SEQ ID NOs: 963, 967, 971, 975, 979, 983, 987, 991, 995, 999, 1003, 1007, 1011, 1015, 1019, 1023, 1027, 1031, 1035, 1039, 1043, 1047, 1051, 1055, 1059, 1063, 1067, 1071, 1075, 1079, 1083, 1087, 1091, 1095, 1099, 1103, 1107, 111 and a heavy chain comprising a sequence selected from the group consisting of SEQ ID NOs: 964, 968, 972, 976, 980, 984, 988, 992, 996, 1000, 1004, 1008, 1012, 1016, 1020, 1024, 1028, 1032, 1036, 1040, 1044, 1048, 1052, 1056, 1060, 1064, 1068, 1072, 1076, 1080, 1084, 1088, 1092, 1096, 1100, 1104, 1108, 1112, 1116, 1120, 1124, 1128, 1132, 1136, 1140, 1144, 1148, 1152, 1156, 1160, 1164, 1168, 1172, 1176, 1180, 1184, 1188, 1192, 1196, 1200, 1289, 1299, 1309, 1319, 1329, 1339, 1349, and 1359.

34. The isolated antigen binding protein of claim 21, wherein said antigen binding protein is an antibody, and wherein said antibody comprises a combination of a light chain and a heavy chain selected from the group consisting of a light chain comprising SEQ ID NO: 963 and a heavy chain comprising SEQ ID NO: 964; a light chain comprising SEQ ID NO: 967 and a heavy chain comprising SEQ ID NO: 968; a light chain comprising SEQ ID NO: 971 and a heavy chain comprising SEQ ID NO: 972; a light chain comprising SEQ ID NO: 975 and a heavy chain comprising SEQ ID NO: 976; a light chain comprising SEQ ID NO: 979 and a heavy chain comprising SEQ ID NO: 980; a light chain comprising SEQ ID NO: 983 and a heavy chain comprising SEQ ID NO: 984; a light chain comprising SEQ ID NO: 987 and a heavy chain comprising SEQ ID NO: 988; a light chain comprising SEQ ID NO: 991 and a heavy chain comprising SEQ ID NO: 992; a light chain comprising SEQ ID NO: 995 and a heavy chain comprising SEQ ID NO: 996; a light chain comprising SEQ ID NO: 999 and a heavy chain comprising SEQ ID NO: 1000; a light chain comprising SEQ ID NO: 1003 and a heavy chain comprising SEQ ID NO: 1004; a light chain comprising SEQ ID NO: 1007 and a heavy chain comprising SEQ ID NO: 1008; a light chain comprising SEQ ID NO: 1011 and a heavy chain comprising SEQ ID NO: 1012; a light chain comprising SEQ ID NO: 1015 and a heavy chain comprising SEQ ID NO: 1016; a light chain comprising SEQ ID NO: 1019 and a heavy chain comprising SEQ ID NO: 1020; a light chain comprising SEQ ID NO: 1023 and a heavy chain comprising SEQ ID NO: 1024; a light chain comprising SEQ ID NO: 1027 and a heavy chain comprising SEQ ID NO: 1028; a light chain comprising SEQ ID NO: 1031 and a heavy chain comprising SEQ ID NO: 1032; a light chain comprising SEQ ID NO: 1035 and a heavy chain comprising SEQ ID NO: 1036; a light chain comprising SEQ ID NO: 1039 and a heavy chain comprising SEQ ID NO: 1040; a light chain comprising SEQ ID NO: 1043

[illegible]

and a heavy chain comprising SEQ ID NO: 1180; a light chain comprising SEQ ID NO: 1183 and a heavy chain comprising SEQ ID NO: 1184; a light chain comprising SEQ ID NO: 1187 and a heavy chain comprising SEQ ID NO: 1188; a light chain comprising SEQ ID NO: 1191 and a heavy chain comprising SEQ ID NO: 1192; a light chain comprising SEQ ID NO: 1195 and a heavy chain comprising SEQ ID NO: 1196; a light chain comprising SEQ ID NO: 1199 and a heavy chain comprising SEQ ID NO: 1200; a light chain comprising SEQ ID NO: 1288 and a heavy chain comprising SEQ ID NO: 1289; a light chain comprising SEQ ID NO: 1298 and a heavy chain comprising SEQ ID NO: 1299; a light chain comprising SEQ ID NO: 1308 and a heavy chain comprising SEQ ID NO: 1309; a light chain comprising SEQ ID NO: 1318 and a heavy chain comprising SEQ ID NO: 1319; a light chain comprising SEQ ID NO: 1328 and a heavy chain comprising SEQ ID NO: 1329; a light chain comprising SEQ ID NO: 1338 and a heavy chain comprising SEQ ID NO: 1339; a light chain comprising SEQ ID NO: 1348 and a heavy chain comprising SEQ ID NO: 1349; and a light chain comprising SEQ ID NO: 1358 and a heavy chain comprising SEQ ID NO: 1359.

35. A nucleic acid molecule encoding the antibody or fragment thereof according to any one of claims 29-34.

36. The nucleic acid molecule according to claim 35, wherein said nucleic acid molecule is operably linked to a control sequence.

37. A vector comprising a nucleic acid molecule according to claim 36.

38. A host cell comprising the nucleic acid molecule according to claim 37.

39. An antibody or fragment thereof produced by the host cell of claim 38.

40. A method of making the antibody or fragment thereof according to any one of claims 29-34, comprising the step of preparing said antibody or fragment thereof from a host cell that secretes said antibody.

41. A pharmaceutical composition comprising at least one antibody or fragment thereof according to any one of claims 29-34, and pharmaceutically acceptable excipient.

42. An isolated antigen binding protein that competes for binding to the extracellular portion of human GIPR with an antibody or fragment thereof of one of claims 29-34.

43. A composition comprising a therapeutically effective amount of a GLP-1 receptor agonist and a therapeutically effective amount of a GIPR antagonist that specifically binds to a protein having an amino acid sequence having at least 90% amino acid sequence identity to an amino acid sequence of a GIPR.

44. The composition of claim 43, wherein the molar ratio of a GLP-1 receptor agonist to a GIPR antagonist is from about 1:1 to 1:110, 1:1 to 1:100, 1:1 to 1:75, 1:1 to 1:50, 1:1 to 1:25, 1:1 to 1:10, 1:1 to 1:5, and 1:1.

45. The composition of claim 43, wherein the molar ratio of a GIPR antagonist to a GLP-1 receptor agonist is from about 1:1 to 1:110, 1:1 to 1:100, 1:1 to 1:75, 1:1 to 1:50, 1:1 to 1:25, 1:1 to 1:10, and 1:1 to 1:5.

46. The composition of claim 43, wherein the GLP-1 receptor agonist is used in combination with the GIPR antagonist at therapeutically effective molar ratios of between about 1:1.5 to 1:150, preferably 1:2 to 1:50.

47. The composition of claim 43, wherein the GLP-1 receptor agonist and the GIPR antagonist are present in doses that are at least about 1.1 to 1.4, 1.5, 2, 3, 4, 5, 6, 7, 8, 9, or 10 fold lower than the doses of each compound alone required to treat a condition and/or disease.

48. The composition of claim 43, wherein the GLP-1 receptor agonist is GLP-1(7-37) or a GLP-1(7-37) analog.

49. The composition of claim 48, wherein the GLP-1 receptor agonist is selected from the group consisting of exenatide, liraglutide, lixisenatide, albiglutide, dulaglutide, semaglutide, and taspoglutide.

50. The composition of claim 43, wherein the GLP-1 receptor agonist is selected from the group consisting of GLP-1(7-37) (SEQ ID NO: 1244); GLP-1(7-36)-NH₂ (SEQ ID NO: 1245); liraglutide; albiglutide; taspoglutide; dulaglutide, semaglutide; LY2428757; desamino-His⁷,Arg²⁶,Lys³⁴(N^ε-(γ-Glu(N-α-hexadecanoyl))) -GLP-1(7-37) (core peptide disclosed as SEQ ID NO: 1282); desamino-His⁷,Arg²⁶,Lys³⁴(N^ε-octanoyl)-GLP-1(7-37) (SEQ ID NO: 1283); Arg^{26,34},Lys³⁸(N^ε-(ω-carboxypentadecanoyl))-GLP-1(7-38) (SEQ ID NO: 1284); Arg^{26,34},Lys³⁶(N^ε-(γ-Glu(N-α-hexadecanoyl))) -GLP-1(7-36) (core peptide disclosed as SEQ ID NO: 1285); Aib^{8,35},Arg^{26,34},Phe³¹-GLP-1(7-36)) (SEQ ID NO: 1246);

HXaa₈EGTFTSDVSSYLEXaa₂₂Xaa₂₃AAKEFIXaa₃₀WLXaa₃₃Xaa₃₄G Xaa₃₆Xaa₃₇; wherein Xaa₈ is A, V, or G; Xaa₂₂ is G, K, or E; Xaa₂₃ is Q or K; Xaa₃₀ is A or E; Xaa₃₃ is V or K; Xaa₃₄ is K, N, or R; Xaa₃₆ is R or G; and Xaa₃₇ is G, H, P, or absent (SEQ ID NO: 1247); Arg³⁴-GLP-1(7-37) (SEQ ID NO: 1248); Glu³⁰-GLP-1(7-37) (SEQ ID NO: 1249); Lys²²-GLP-1(7-37) (SEQ ID NO: 1250); Gly^{8,36},Glu²²-GLP-1(7-37) (SEQ ID NO: 1251); Val⁸,Glu²²,Gly³⁶-GLP-1(7-37) (SEQ ID NO: 1252); Gly^{8,36},Glu²²,Lys³³,Asn³⁴-GLP-1(7-37) (SEQ ID NO: 1253); Val⁸,Glu²²,Lys³³,Asn³⁴,Gly³⁶-GLP-1(7-37) (SEQ ID NO: 1254); Gly^{8,36},Glu²²,Pro³⁷-GLP-1(7-37) (SEQ ID NO: 1255); Val⁸,Glu²²,Gly³⁶Pro³⁷-GLP-1(7-37) (SEQ ID NO: 1256); Gly^{8,36},Glu²²,Lys³³, Asn³⁴,Pro³⁷-GLP-1(7-37) (SEQ ID NO: 1257); Val⁸,Glu²²,Lys³³,Asn³⁴,Gly³⁶,Pro³⁷-GLP-1(7-37) (SEQ ID NO: 1258); Gly^{8,36},Glu²²-GLP-1(7-36) (SEQ ID NO: 1259); Val⁸,Glu²²,Gly³⁶-GLP-1(7-36) (SEQ ID NO: 1260); Val⁸,Glu²²,Asn³⁴,Gly³⁶-GLP-1(7-36) (SEQ ID NO: 1261); and Gly^{8,36},Glu²²,Asn³⁴-GLP-1(7-36) (SEQ ID NO: 1262).

51. The composition of claim 43, wherein human GIPR has a sequence comprising a sequence selected from the group consisting of SEQ ID NO: 1201, SEQ ID NO: 1203, and SEQ ID NO: 1205.

52. The composition of claim 43, wherein the GIPR antagonist is an antigen binding protein.

53. The composition of claim 52, wherein the antigen binding protein is a monoclonal antibody, a polyclonal antibody, a recombinant antibody, a human antibody, a humanized antibody, a chimeric antibody, a multispecific antibody, or an antibody fragment thereof.

54. The composition of claim 53, wherein the antibody fragment is a Fab fragment, a Fab' fragment, or a F(ab')₂ fragment.

55. The composition of claim 53, wherein the antigen binding protein is a human antibody.

56. The composition of claim 53, wherein the antigen binding protein is a monoclonal antibody.

57. The composition of claim 53, wherein the antigen binding protein is of the IgG1-, IgG2-, IgG3- or IgG4-type.

58. The composition of claim 57, wherein the antigen binding protein is of the IgG1- or the IgG2-type.

59. The composition of claim 53, wherein the antigen binding protein is coupled to a labeling group.

60. The composition of claim 53, wherein the antigen binding protein inhibits binding of GIP to the extracellular portion of human GIPR.

61. The composition of claim 53, wherein the antigen binding protein is an antibody or a fragment thereof, and wherein the antibody comprises a CDRL1, a CDRL2, a CDRL3, a CDRH1, a CDRH2, and a CDRH3, wherein the CDRL1 comprises a sequence selected from the group consisting of SEQ ID NOs: 4, 10, 16, 22, 28, 34, 40, 46, 52, 58, 64, 70, 76, 82, 88, 94, 100, 106, 112, 118, 124, 130, 136, 142, 148, 154, 160, 166, 172, 178, 184, 190, 196, 202, 208, 214, 220, 226, 232, 238, 244, 250, 256, 262, 268, 274, 280, 286, 292, 298, 304, 310, 316, 322, 328, 334, 340, 346, 352, 358, 1290, 1300, 1310, 1320, 1330, 1340, and 1350; the CDRL2 comprises a sequence selected from the group consisting of SEQ ID NOs: 5, 11, 17, 23, 29, 35, 41, 47, 53, 59, 65, 71, 77, 83, 89, 95, 101, 107, 113, 119, 125, 131, 137, 143, 149, 155, 161, 167, 173, 179, 185, 191, 197, 203, 209, 215, 221, 227, 233, 239, 245, 251, 257, 263, 269, 275, 281, 287, 293, 299, 305, 311, 317, 323, 329, 335, 341, 347, 353, 359, 1291, 1301, 1311, 1321, 1331, 1341, and 1351; the CDRL3 comprises a sequence selected from the group consisting of SEQ ID NOs: 6, 12, 18, 24, 30, 36, 42, 48, 54, 60, 66, 72, 78, 84, 90, 96, 102, 108, 114, 120, 126, 132, 138, 144, 150, 156, 162, 168, 174, 180, 186, 192, 198, 204, 210, 216, 222, 228, 234, 240, 246, 252, 258, 264, 270, 276, 282, 288, 294, 300, 306, 312, 318, 324, 330, 336, 342, 348, 354, 360, 1292, 1302, 1312, 1322, 1332, 1342, and 1352; the CDRH1 comprises a sequence selected from the group consisting of SEQ ID NOs: 364, 370, 376, 382, 388, 394, 400, 406, 412, 418, 424, 430, 436, 442, 448, 454, 460, 466, 472, 478, 484, 490, 496, 502, 508, 514, 520, 526, 532, 538, 544, 550, 556, 562, 568, 574, 580, 586, 592, 598, 604, 610, 616, 622, 628, 634, 640, 646, 652, 658, 664, 670, 676, 682, 688, 694, 700, 706, 712, 718, 1293, 1303, 1313, 1323, 1333, 1343, and 1353; the CDRH2 comprises a sequence selected from the group consisting of SEQ ID NOs: 365, 371, 377, 383, 389, 395, 401, 407, 413, 419, 425, 431, 437, 443, 449, 455, 461, 467, 473, 479, 485, 491, 497, 503, 509, 515, 521, 527, 533, 539, 545, 551, 557, 563, 569, 575, 581, 587, 593, 599, 605, 611, 617, 623, 629, 635, 641, 647, 653, 659, 665, 671, 677, 683, 689, 695, 701, 707, 713, 719, 1294, 1304, 1314, 1324, 1334, 1344, and 1354; and the CDRH3

comprises a sequence selected from the group consisting of SEQ ID NOs: 366, 372, 378, 384, 390, 396, 402, 408, 414, 420, 426, 432, 438, 444, 450, 456, 462, 468, 474, 480, 486, 492, 498, 504, 510, 516, 522, 528, 534, 540, 546, 552, 558, 564, 570, 576, 582, 588, 594, 600, 606, 612, 618, 624, 630, 636, 642, 648, 654, 660, 666, 672, 678, 684, 690, 696, 702, 708, 714, 720, 1295, 1305, 1315, 1325, 1335, 1345, and 1355.

62. The composition of claim 53, wherein the antigen binding protein is an antibody or a fragment thereof, and wherein the antibody comprises a CDRL1, a CDRL2, a CDRL3, a CDRH1, a CDRH2, and a CDRH3, wherein each CDRL1, CDRL2, CDRL3, CDRH1, CDRH2, and CDRH3, respectively, comprises a sequence selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 364, SEQ ID NO: 365, and SEQ ID NO: 366; SEQ ID NO: 10, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 370, SEQ ID NO: 371, and SEQ ID NO: 372; SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, SEQ ID NO: 376, SEQ ID NO: 377, and SEQ ID NO: 378; SEQ ID NO: 22, SEQ ID NO: 23, SEQ ID NO: 24, SEQ ID NO: 382, SEQ ID NO: 383, and SEQ ID NO: 384; SEQ ID NO: 28, SEQ ID NO: 29, SEQ ID NO: 30, SEQ ID NO: 388, SEQ ID NO: 389, and SEQ ID NO: 390; SEQ ID NO: 34, SEQ ID NO: 35, SEQ ID NO: 36, SEQ ID NO: 394, SEQ ID NO: 395, and SEQ ID NO: 396; SEQ ID NO: 40, SEQ ID NO: 41, SEQ ID NO: 42, SEQ ID NO: 400, SEQ ID NO: 401, and SEQ ID NO: 402; SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 406, SEQ ID NO: 407, and SEQ ID NO: 408; SEQ ID NO: 52, SEQ ID NO: 53, SEQ ID NO: 54, SEQ ID NO: 412, SEQ ID NO: 413, and SEQ ID NO: 414; SEQ ID NO: 58, SEQ ID NO: 59, SEQ ID NO: 60, SEQ ID NO: 418, SEQ ID NO: 419, and SEQ ID NO: 420; SEQ ID NO: 64, SEQ ID NO: 65, SEQ ID NO: 66, SEQ ID NO: 424, SEQ ID NO: 425, and SEQ ID NO: 426; SEQ ID NO: 70, SEQ ID NO: 71, SEQ ID NO: 72, SEQ ID NO: 430, SEQ ID NO: 431, and SEQ ID NO: 432; SEQ ID NO: 76, SEQ ID NO: 77, SEQ ID NO: 78, SEQ ID NO: 436, SEQ ID NO: 437, and SEQ ID NO: 438; SEQ ID NO: 82, SEQ ID NO: 83, SEQ ID NO: 84, SEQ ID NO: 442, SEQ ID NO: 443, and SEQ ID NO: 444; SEQ ID NO: 88, SEQ ID NO: 89, SEQ ID NO: 90, SEQ ID NO: 448, SEQ ID NO: 449, and SEQ ID NO: 450; SEQ ID NO: 94, SEQ ID NO: 95, SEQ ID NO: 96, SEQ ID NO: 454, SEQ ID NO: 455, and SEQ ID NO: 456; SEQ ID NO: 100, SEQ ID NO: 101, SEQ ID NO: 102, SEQ ID NO: 460, SEQ ID NO: 461, and SEQ ID NO: 462; SEQ ID NO: 106, SEQ ID NO: 107, SEQ ID NO: 108, SEQ ID NO: 466, SEQ ID NO: 467, and SEQ ID NO: 468; SEQ ID NO: 112, SEQ ID NO: 113, SEQ ID NO: 114, SEQ ID NO: 472, SEQ ID NO: 473, and SEQ ID NO: 474; SEQ ID NO: 118, SEQ ID NO: 119, SEQ ID NO: 120, SEQ ID NO: 478, SEQ ID NO: 479, and SEQ ID NO: 480; SEQ ID NO: 124, SEQ ID NO: 125, SEQ ID NO: 126, SEQ ID NO: 484, SEQ

ID NO: 485, and SEQ ID NO: 486; SEQ ID NO: 130, SEQ ID NO: 131, SEQ ID NO: 132, SEQ ID NO: 490, SEQ ID NO: 491, and SEQ ID NO: 492; SEQ ID NO: 136, SEQ ID NO: 137, SEQ ID NO: 138, SEQ ID NO: 496, SEQ ID NO: 497, and SEQ ID NO: 498; SEQ ID NO: 142, SEQ ID NO: 143, SEQ ID NO: 144, SEQ ID NO: 502, SEQ ID NO: 503, and SEQ ID NO: 504; SEQ ID NO: 148, SEQ ID NO: 149, SEQ ID NO: 150, SEQ ID NO: 508, SEQ ID NO: 509, and SEQ ID NO: 510; SEQ ID NO: 154, SEQ ID NO: 155, SEQ ID NO: 156, SEQ ID NO: 514, SEQ ID NO: 515, and SEQ ID NO: 516; SEQ ID NO: 160, SEQ ID NO: 161, SEQ ID NO: 162, SEQ ID NO: 520, SEQ ID NO: 521, and SEQ ID NO: 522; SEQ ID NO: 166, SEQ ID NO: 167, SEQ ID NO: 168, SEQ ID NO: 526, SEQ ID NO: 527, and SEQ ID NO: 528; SEQ ID NO: 172, SEQ ID NO: 173, SEQ ID NO: 174, SEQ ID NO: 532, SEQ ID NO: 533, and SEQ ID NO: 534; SEQ ID NO: 178, SEQ ID NO: 179, SEQ ID NO: 180, SEQ ID NO: 538, SEQ ID NO: 539, and SEQ ID NO: 540; SEQ ID NO: 184, SEQ ID NO: 185, SEQ ID NO: 186, SEQ ID NO: 544, SEQ ID NO: 545, and SEQ ID NO: 546; SEQ ID NO: 190, SEQ ID NO: 191, SEQ ID NO: 192, SEQ ID NO: 550, SEQ ID NO: 551, and SEQ ID NO: 552; SEQ ID NO: 196, SEQ ID NO: 197, SEQ ID NO: 198, SEQ ID NO: 556, SEQ ID NO: 557, and SEQ ID NO: 558; SEQ ID NO: 202, SEQ ID NO: 203, SEQ ID NO: 204, SEQ ID NO: 562, SEQ ID NO: 563, and SEQ ID NO: 564; SEQ ID NO: 208, SEQ ID NO: 209, SEQ ID NO: 210, SEQ ID NO: 568, SEQ ID NO: 569, and SEQ ID NO: 570; SEQ ID NO: 214, SEQ ID NO: 215, SEQ ID NO: 216, SEQ ID NO: 574, SEQ ID NO: 575, and SEQ ID NO: 576; SEQ ID NO: 220, SEQ ID NO: 221, SEQ ID NO: 222, SEQ ID NO: 580, SEQ ID NO: 581, and SEQ ID NO: 582; SEQ ID NO: 226, SEQ ID NO: 227, SEQ ID NO: 228, SEQ ID NO: 586, SEQ ID NO: 587, and SEQ ID NO: 588; SEQ ID NO: 232, SEQ ID NO: 233, SEQ ID NO: 234, SEQ ID NO: 592, SEQ ID NO: 593, and SEQ ID NO: 594; SEQ ID NO: 238, SEQ ID NO: 239, SEQ ID NO: 240, SEQ ID NO: 598, SEQ ID NO: 599, and SEQ ID NO: 600; SEQ ID NO: 244, SEQ ID NO: 245, SEQ ID NO: 246, SEQ ID NO: 604, SEQ ID NO: 605, and SEQ ID NO: 606; SEQ ID NO: 250, SEQ ID NO: 251, SEQ ID NO: 252, SEQ ID NO: 610, SEQ ID NO: 611, and SEQ ID NO: 612; SEQ ID NO: 256, SEQ ID NO: 257, SEQ ID NO: 258, SEQ ID NO: 616, SEQ ID NO: 617, and SEQ ID NO: 618; SEQ ID NO: 262, SEQ ID NO: 263, SEQ ID NO: 264, SEQ ID NO: 622, SEQ ID NO: 623, and SEQ ID NO: 624; SEQ ID NO: 268, SEQ ID NO: 269, SEQ ID NO: 270, SEQ ID NO: 628, SEQ ID NO: 629, and SEQ ID NO: 630; SEQ ID NO: 274, SEQ ID NO: 275, SEQ ID NO: 276, SEQ ID NO: 634, SEQ ID NO: 635, and SEQ ID NO: 636; SEQ ID NO: 280, SEQ ID NO: 281, SEQ ID NO: 282, SEQ ID NO: 640, SEQ ID NO: 641, and SEQ ID NO: 642; SEQ ID NO: 286, SEQ ID NO: 287, SEQ ID NO: 288, SEQ ID NO: 646, SEQ ID NO: 647, and SEQ

ID NO: 648; SEQ ID NO: 292, SEQ ID NO: 293, SEQ ID NO: 294, SEQ ID NO: 652, SEQ ID NO: 653, and SEQ ID NO: 654; SEQ ID NO: 298, SEQ ID NO: 299, SEQ ID NO: 300, SEQ ID NO: 658, SEQ ID NO: 659, and SEQ ID NO: 660; SEQ ID NO: 304, SEQ ID NO: 305, SEQ ID NO: 306, SEQ ID NO: 664, SEQ ID NO: 665, and SEQ ID NO: 666; SEQ ID NO: 310, SEQ ID NO: 311, SEQ ID NO: 312, SEQ ID NO: 670, SEQ ID NO: 671, and SEQ ID NO: 672; SEQ ID NO: 316, SEQ ID NO: 317, SEQ ID NO: 318, SEQ ID NO: 676, SEQ ID NO: 677, and SEQ ID NO: 678; SEQ ID NO: 322, SEQ ID NO: 323, SEQ ID NO: 324, SEQ ID NO: 682, SEQ ID NO: 683, and SEQ ID NO: 684; SEQ ID NO: 328, SEQ ID NO: 329, SEQ ID NO: 330, SEQ ID NO: 688, SEQ ID NO: 689, and SEQ ID NO: 690; SEQ ID NO: 334, SEQ ID NO: 335, SEQ ID NO: 336, SEQ ID NO: 694, SEQ ID NO: 695, and SEQ ID NO: 696; SEQ ID NO: 340, SEQ ID NO: 341, SEQ ID NO: 342, SEQ ID NO: 700, SEQ ID NO: 701, and SEQ ID NO: 702; SEQ ID NO: 346, SEQ ID NO: 347, SEQ ID NO: 348, SEQ ID NO: 706, SEQ ID NO: 707, and SEQ ID NO: 708; SEQ ID NO: 352, SEQ ID NO: 353, SEQ ID NO: 354, SEQ ID NO: 712, SEQ ID NO: 713, and SEQ ID NO: 714; SEQ ID NO: 358, SEQ ID NO: 359, SEQ ID NO: 360, SEQ ID NO: 718, SEQ ID NO: 719, and SEQ ID NO: 720; SEQ ID NO: 1290, SEQ ID NO: 1291, SEQ ID NO: 1292, SEQ ID NO: 1293, SEQ ID NO: 1294, and SEQ ID NO: 1295; SEQ ID NO: 1300, SEQ ID NO: 1301, SEQ ID NO: 1302, SEQ ID NO: 1303, SEQ ID NO: 1304, and SEQ ID NO: 1305; SEQ ID NO: 1310, SEQ ID NO: 1311, SEQ ID NO: 1312, SEQ ID NO: 1313, SEQ ID NO: 1314, and SEQ ID NO: 1315; SEQ ID NO: 1320, SEQ ID NO: 1321, SEQ ID NO: 1322, SEQ ID NO: 1323, SEQ ID NO: 1324, and SEQ ID NO: 1325; SEQ ID NO: 1330, SEQ ID NO: 1331, SEQ ID NO: 1332, SEQ ID NO: 1333, SEQ ID NO: 1334, and SEQ ID NO: 1335; SEQ ID NO: 1340, SEQ ID NO: 1341, SEQ ID NO: 1342, SEQ ID NO: 1343, SEQ ID NO: 1344, and SEQ ID NO: 1345; SEQ ID NO: 1350, SEQ ID NO: 1351, SEQ ID NO: 1352, SEQ ID NO: 1353, SEQ ID NO: 1354, and SEQ ID NO: 1355; and SEQ ID NO: 1360, SEQ ID NO: 1361, SEQ ID NO: 1362, SEQ ID NO: 1363, SEQ ID NO: 1364, and SEQ ID NO: 1365.

63. The composition of claim 53, wherein the antigen binding protein is an antibody or a fragment thereof, and wherein the antibody or fragment thereof comprises a light chain variable region comprising a sequence selected from the group consisting of SEQ ID NOs: 723, 727, 731, 735, 739, 743, 747, 751, 755, 759, 763, 767, 771, 775, 779, 783, 787, 791, 795, 799, 803, 807, 811, 815, 819, 823, 827, 831, 835, 839, 843, 847, 851, 855, 859, 863, 867, 871, 875, 879, 883, 887, 891, 895, 899, 903, 907, 911, 915, 919, 923, 927, 931, 935, 939, 943, 947, 951, 955, 959, 1286, 1296, 1306, 1316, 1326, 1336, 1346, and 1356 and a heavy chain variable region comprising a sequence selected from the group consisting of

SEQ ID NOs: 724, 728, 732, 736, 740, 744, 748, 752, 756, 760, 764, 768, 772, 776, 780, 784, 788, 792, 796, 800, 804, 808, 812, 816, 820, 824, 828, 832, 836, 840, 844, 848, 852, 856, 860, 864, 868, 872, 876, 880, 884, 888, 892, 896, 900, 904, 908, 912, 916, 920, 924, 928, 932, 936, 940, 944, 948, 952, 956, 960, 1287, 1297, 1307, 1317, 1327, 1337, 1347, and 1357.

64. The composition of claim 53, wherein the antigen binding protein is an antibody or a fragment thereof, and wherein the antibody or fragment thereof comprises a combination of a light chain variable region and a heavy chain variable region selected from the group consisting of a light chain variable region comprising SEQ ID NO: 723 and a heavy chain variable region comprising SEQ ID NO: 724; a light chain variable region comprising SEQ ID NO: 727 and a heavy chain variable region comprising SEQ ID NO: 728; a light chain variable region comprising SEQ ID NO: 731 and a heavy chain variable region comprising SEQ ID NO: 732; a light chain variable region comprising SEQ ID NO: 735 and a heavy chain variable region comprising SEQ ID NO: 736; a light chain variable region comprising SEQ ID NO: 739 and a heavy chain variable region comprising SEQ ID NO: 740; a light chain variable region comprising SEQ ID NO: 743 and a heavy chain variable region comprising SEQ ID NO: 744; a light chain variable region comprising SEQ ID NO: 747 and a heavy chain variable region comprising SEQ ID NO: 748; a light chain variable region comprising SEQ ID NO: 751 and a heavy chain variable region comprising SEQ ID NO: 752; a light chain variable region comprising SEQ ID NO: 755 and a heavy chain variable region comprising SEQ ID NO: 756; a light chain variable region comprising SEQ ID NO: 759 and a heavy chain variable region comprising SEQ ID NO: 760; a light chain variable region comprising SEQ ID NO: 763 and a heavy chain variable region comprising SEQ ID NO: 764; a light chain variable region comprising SEQ ID NO: 767 and a heavy chain variable region comprising SEQ ID NO: 768; a light chain variable region comprising SEQ ID NO: 771 and a heavy chain variable region comprising SEQ ID NO: 772; a light chain variable region comprising SEQ ID NO: 775 and a heavy chain variable region comprising SEQ ID NO: 776; a light chain variable region comprising SEQ ID NO: 779 and a heavy chain variable region comprising SEQ ID NO: 780; a light chain variable region comprising SEQ ID NO: 783 and a heavy chain variable region comprising SEQ ID NO: 784; a light chain variable region comprising SEQ ID NO: 787 and a heavy chain variable region comprising SEQ ID NO: 788; a light chain variable region comprising SEQ ID NO: 791 and a heavy chain variable region comprising SEQ ID NO: 792; a light chain variable region comprising SEQ ID NO: 795 and a heavy chain variable region comprising SEQ ID NO: 796; a light chain variable region comprising SEQ ID NO: 799 and a heavy chain variable region comprising SEQ ID NO: 800;

a heavy chain variable region comprising SEQ ID NO: 904; a light chain variable region comprising SEQ ID NO: 907 and a heavy chain variable region comprising SEQ ID NO: 908; a light chain variable region comprising SEQ ID NO: 911 and a heavy chain variable region comprising SEQ ID NO: 912; a light chain variable region comprising SEQ ID NO: 915 and a heavy chain variable region comprising SEQ ID NO: 916; a light chain variable region comprising SEQ ID NO: 919 and a heavy chain variable region comprising SEQ ID NO: 920; a light chain variable region comprising SEQ ID NO: 923 and a heavy chain variable region comprising SEQ ID NO: 924; a light chain variable region comprising SEQ ID NO: 927 and a heavy chain variable region comprising SEQ ID NO: 928; a light chain variable region comprising SEQ ID NO: 931 and a heavy chain variable region comprising SEQ ID NO: 932; a light chain variable region comprising SEQ ID NO: 935 and a heavy chain variable region comprising SEQ ID NO: 936; a light chain variable region comprising SEQ ID NO: 939 and a heavy chain variable region comprising SEQ ID NO: 940; a light chain variable region comprising SEQ ID NO: 943 and a heavy chain variable region comprising SEQ ID NO: 944; a light chain variable region comprising SEQ ID NO: 947 and a heavy chain variable region comprising SEQ ID NO: 948; a light chain variable region comprising SEQ ID NO: 951 and a heavy chain variable region comprising SEQ ID NO: 952; a light chain variable region comprising SEQ ID NO: 955 and a heavy chain variable region comprising SEQ ID NO: 956; a light chain variable region comprising SEQ ID NO: 959 and a heavy chain variable region comprising SEQ ID NO: 960; a light chain variable region comprising SEQ ID NO: 1286 and a heavy chain variable region comprising SEQ ID NO: 1287; a light chain variable region comprising SEQ ID NO: 1296 and a heavy chain variable region comprising SEQ ID NO: 1297; a light chain variable region comprising SEQ ID NO: 1306 and a heavy chain variable region comprising SEQ ID NO: 1307; a light chain variable region comprising SEQ ID NO: 1316 and a heavy chain variable region comprising SEQ ID NO: 1317; a light chain variable region comprising SEQ ID NO: 1326 and a heavy chain variable region comprising SEQ ID NO: 1327; a light chain variable region comprising SEQ ID NO: 1336 and a heavy chain variable region comprising SEQ ID NO: 1337; a light chain variable region comprising SEQ ID NO: 1346 and a heavy chain variable region comprising SEQ ID NO: 1347; and a light chain variable region comprising SEQ ID NO: 1356 and a heavy chain variable region comprising SEQ ID NO: 1357.

65. The composition of claim 53, wherein the antigen binding protein is an antibody, and wherein the antibody comprises a light chain comprising a sequence selected from the group consisting of SEQ ID NOs: 963, 967, 971, 975, 979, 983, 987, 991, 995, 999,

1003, 1007, 1011, 1015, 1019, 1023, 1027, 1031, 1035, 1039, 1043, 1047, 1051, 1055, 1059, 1063, 1067, 1071, 1075, 1079, 1083, 1087, 1091, 1095, 1099, 1103, 1107, 111 and a heavy chain comprising a sequence selected from the group consisting of SEQ ID NOs: 964, 968, 972, 976, 980, 984, 988, 992, 996, 1000, 1004, 1008, 1012, 1016, 1020, 1024, 1028, 1032, 1036, 1040, 1044, 1048, 1052, 1056, 1060, 1064, 1068, 1072, 1076, 1080, 1084, 1088, 1092, 1096, 1100, 1104, 1108, 1112, 1116, 1120, 1124, 1128, 1132, 1136, 1140, 1144, 1148, 1152, 1156, 1160, 1164, 1168, 1172, 1176, 1180, 1184, 1188, 1192, 1196, 1200, 1289, 1299, 1309, 1319, 1329, 1339, 1349, and 1359.

66. The composition of claim 53, wherein the antigen binding protein is an antibody, and wherein the antibody comprises a combination of a light chain and a heavy chain selected from the group consisting of a light chain comprising SEQ ID NO: 963 and a heavy chain comprising SEQ ID NO: 964; a light chain comprising SEQ ID NO: 967 and a heavy chain comprising SEQ ID NO: 968; a light chain comprising SEQ ID NO: 971 and a heavy chain comprising SEQ ID NO: 972; a light chain comprising SEQ ID NO: 975 and a heavy chain comprising SEQ ID NO: 976; a light chain comprising SEQ ID NO: 979 and a heavy chain comprising SEQ ID NO: 980; a light chain comprising SEQ ID NO: 983 and a heavy chain comprising SEQ ID NO: 984; a light chain comprising SEQ ID NO: 987 and a heavy chain comprising SEQ ID NO: 988; a light chain comprising SEQ ID NO: 991 and a heavy chain comprising SEQ ID NO: 992; a light chain comprising SEQ ID NO: 995 and a heavy chain comprising SEQ ID NO: 996; a light chain comprising SEQ ID NO: 999 and a heavy chain comprising SEQ ID NO: 1000; a light chain comprising SEQ ID NO: 1003 and a heavy chain comprising SEQ ID NO: 1004; a light chain comprising SEQ ID NO: 1007 and a heavy chain comprising SEQ ID NO: 1008; a light chain comprising SEQ ID NO: 1011 and a heavy chain comprising SEQ ID NO: 1012; a light chain comprising SEQ ID NO: 1015 and a heavy chain comprising SEQ ID NO: 1016; a light chain comprising SEQ ID NO: 1019 and a heavy chain comprising SEQ ID NO: 1020; a light chain comprising SEQ ID NO: 1023 and a heavy chain comprising SEQ ID NO: 1024; a light chain comprising SEQ ID NO: 1027 and a heavy chain comprising SEQ ID NO: 1028; a light chain comprising SEQ ID NO: 1031 and a heavy chain comprising SEQ ID NO: 1032; a light chain comprising SEQ ID NO: 1035 and a heavy chain comprising SEQ ID NO: 1036; a light chain comprising SEQ ID NO: 1039 and a heavy chain comprising SEQ ID NO: 1040; a light chain comprising SEQ ID NO: 1043 and a heavy chain comprising SEQ ID NO: 1044; a light chain comprising SEQ ID NO: 1047 and a heavy chain comprising SEQ ID NO: 1048; a light chain comprising SEQ ID NO: 1051 and a heavy chain comprising SEQ ID NO: 1052; a light chain comprising SEQ ID NO: 1055 and a

heavy chain comprising SEQ ID NO: 1192; a light chain comprising SEQ ID NO: 1195 and a heavy chain comprising SEQ ID NO: 1196; a light chain comprising SEQ ID NO: 1199 and a heavy chain comprising SEQ ID NO: 1200; a light chain comprising SEQ ID NO: 1288 and a heavy chain comprising SEQ ID NO: 1289; a light chain comprising SEQ ID NO: 1298 and a heavy chain comprising SEQ ID NO: 1299; a light chain comprising SEQ ID NO: 1308 and a heavy chain comprising SEQ ID NO: 1309; a light chain comprising SEQ ID NO: 1318 and a heavy chain comprising SEQ ID NO: 1319; a light chain comprising SEQ ID NO: 1328 and a heavy chain comprising SEQ ID NO: 1329; a light chain comprising SEQ ID NO: 1338 and a heavy chain comprising SEQ ID NO: 1339; a light chain comprising SEQ ID NO: 1348 and a heavy chain comprising SEQ ID NO: 1349; and a light chain comprising SEQ ID NO: 1358 and a heavy chain comprising SEQ ID NO: 1359.