of SEQ ID NOs: 92-111. Further provided herein are antibodies or antibody fragments, wherein the VL comprises a sequence of any one of SEQ ID NOs: 92-111.

[0006a] Provided herein is an antibody or antibody fragment comprising a variable domain, heavy chain region (VH) and a variable domain, light chain region (VL), wherein VH comprises complementarity determining regions CDRH1, CDRH2, and CDRH3, wherein VL comprises complementarity determining regions CDRL1, CDRL2, and CDRL3, and wherein (a) an amino acid sequence of CDRH1 is as set forth in any one of SEQ ID NOs: 441-619; (b) an amino acid sequence of CDRH2 is as set forth in any one of SEQ ID NOs: 620-798; (c) an amino acid sequence of CDRH3 is as set forth in any one of SEQ ID NOs: 799-977; (d) an amino acid sequence of CDRL1 is as set forth in any one of SEQ ID NOs: 978-1156; (e) an amino acid sequence of CDRL2 is as set forth in any one of SEQ ID NOs: 1157-1168; and (f) an amino acid sequence of CDRL3 is as set forth in any one of SEQ ID NOs: 1169-1347.

[0007] Provided herein are methods of treating a metabolic disease or disorder comprising administering an antibody or antibody fragment that binds GLP1R comprising a variable domain, heavy chain region (VH) and a variable domain, light chain region (VL), wherein VH comprises complementarity determining regions CDRH1, CDRH2, and CDRH3, wherein VL comprises complementarity determining regions CDRL1, CDRL2, and CDRL3, and wherein (a) an amino acid sequence of CDRH1 is as set forth in any one of SEQ ID NOs: 441-619; (b) an amino acid sequence of CDRH2 is as set forth in any one of SEQ ID NOs: 620-798; (c) an amino acid sequence of CDRH3 is as set forth in any one of SEQ ID NOs: 799-977; (d) an amino acid sequence of CDRL1 is as set forth in any one of SEQ ID NOs: 978-1156; (e) an amino acid sequence of CDRL2 is as set forth in any one of SEQ ID NOs: 1157-1168; and (f) an amino acid sequence of CDRL3 is as set forth in any one of SEQ ID NOs: 1169-1347. Further provided herein are methods, wherein the antibody is a monoclonal antibody, a polyclonal antibody, a bi-specific antibody, a multispecific antibody, a grafted antibody, a human antibody, a humanized antibody, a synthetic antibody, a chimeric antibody, a camelized antibody, a single-chain Fvs (scFv), a single chain antibody, a Fab fragment, a F(ab′)2 fragment, a Fd fragment, a Fv fragment, a single-domain antibody, an isolated complementarity determining region (CDR), a diabody, a fragment comprised of only a single monomeric variable domain, disulfide-linked Fvs (sdFv), an intrabody, an anti-idiotypic (anti-Id) antibody, or ab antigen-binding fragments thereof. Further provided herein are methods, wherein the antibody or antibody fragment thereof is chimeric or humanized. Further provided herein are methods, wherein the antibody or antibody fragment has an EC50 less than about 25 nanomolar in a cAMP assay. Further provided herein are methods, wherein the antibody or antibody fragment has an EC50 less than about 20 nanomolar in a cAMP assay. Further

provided herein are methods, wherein the antibody or antibody fragment has an EC50 less than about 10 nanomolar in a cAMP assay. Further provided herein are methods, wherein the antibody or antibody fragment is an agonist of GLP1R. Further provided herein are methods, wherein the antibody or antibody fragment is an antagonist of GLP1R. Further provided herein are methods, wherein the antibody or antibody fragment is an allosteric modulator of GLP1R. Further provided herein are methods, wherein the allosteric modulator of GLP1R is a negative allosteric modulator. Further provided herein are methods, wherein the antibody or antibody fragment is an allosteric modulator. Further provided herein are methods, wherein the antibody or antibody fragment is a negative allosteric modulator. Further provided herein are methods, wherein the VH comprises a sequence at least about 90% identical to any one of SEQ ID NOs: 58-77. Further provided herein

are methods, wherein the VH comprises a sequence of any one of SEQ ID NOs: 58-77. Further provided herein are methods, wherein the VL comprises a sequence at least about 90% identical to any one of SEQ ID NOs: 92-111. Further provided herein are methods, wherein the VL comprises a sequence of any one of SEQ ID NOs: 92-111. Further provided herein are methods, wherein the metabolic disease or disorder is Type II diabetes or obesity.

[0007a] Provided herein is a use of an antibody or antibody fragment that binds GLP1R comprising a variable domain, heavy chain region (VH) and a variable domain, light chain region (VL), wherein VH comprises complementarity determining regions CDRH1, CDRH2, and CDRH3, wherein VL comprises complementarity determining regions CDRL1, CDRL2, and CDRL3, and wherein (a) an amino acid sequence of CDRH1 is as set forth in any one of SEQ ID NOs: 441-619; (b) an amino acid sequence of CDRH2 is as set forth in any one of SEQ ID NOs: 620-798; (c) an amino acid sequence of CDRH3 is as set forth in any one of SEQ ID NOs: 799-977; (d) an amino acid sequence of CDRL1 is as set forth in any one of SEQ ID NOs: 978-1156; (e) an amino acid sequence of CDRL2 is as set forth in any one of SEQ ID NOs: 1157-1168; and (f) an amino acid sequence of CDRL3 is as set forth in any one of SEQ ID NOs: 1169-1347, for the manufacture of a medicament for the treatment of a metabolic disease or disorder.

[0008] Provided herein are nucleic acid compositions comprising: a) a first nucleic acid encoding a variable domain, heavy chain region (VH) comprising complementarity determining regions CDRH1, CDRH2, and CDRH3, and wherein (i) an amino acid sequence of CDRH1 is as set forth in any one of SEQ ID NOs: 441-619; (ii) an amino acid sequence of CDRH2 is as set forth in any one of SEQ ID NOs: 620-798; (iii) an amino acid sequence of CDRH3 is as set forth in any one of SEQ ID NOs: 799-977; b) a second nucleic acid encoding a variable domain, light chain region (VL) comprising complementarity determining regions CDRL1, CDRL2, and CDRL3, and wherein (i) an amino acid sequence of CDRL1 is as set forth in any one of SEQ ID NOs: 978-1156; (ii) an amino acid sequence of CDRL2 is as set forth in any one of SEQ ID NOs: 1157-1168; and (iii) an amino acid sequence of CDRL3 is as set forth in any one of SEQ ID NOs: 1169-1347.

[0009] Provided herein are nucleic acid compositions comprising: a) a first nucleic acid encoding a variable domain, heavy chain region (VH) comprising an amino acid sequence at least about 90% identical to a sequence as set forth in any one of SEQ ID NOs: 58-77; b) a second nucleic acid encoding a variable domain, light chain region (VL) comprising at least about 90% identical to a sequence as set forth in any one of SEQ ID NOs: 92-111; and an excipient. Further provided herein are nucleic acid compositions, wherein the VH comprises an amino acid sequence as set forth in any one of SEQ ID NOs: 58-77. Further provided herein are nucleic acid compositions, wherein the VL comprises an amino acid sequence as set forth in any one of SEQ ID

NOs: 92-111. Further provided herein are nucleic acid compositions, wherein the VH comprises an amino acid sequence as set forth in any one of SEQ ID NOs: 58-77, and wherein the VL comprises an amino acid sequence as set forth in any one of SEQ ID NOs: 92-111.

[0009a] Provided herein is an antibody or antibody fragment comprising a variable domain, heavy chain region (VH) and a variable domain, light chain region (VL), wherein VH comprises complementarity determining regions CDRH1, CDRH2, and CDRH3, wherein VL comprises complementarity determining regions CDRL1, CDRL2, and CDRL3, and wherein (a) an amino acid sequence of CDRH1 is as set forth in any one of SEQ ID NOs: 441-619; (b) an amino acid sequence of CDRH2 is as set forth in any one of SEQ ID NOs: 620-798; (c) an amino acid sequence of CDRH3 is as set forth in any one of SEQ ID NOs: 799-977; (d) an amino acid sequence of CDRL1 is as set forth in any one of SEQ ID NOs: 978-1156; (e) an amino acid sequence of CDRL2 is as set forth in any one of SEQ ID NOs: 1157-1168; and (f) an amino acid sequence of CDRL3 is as set forth in any one of SEQ ID NOs: 1169-1347 for use in therapy.

BRIEF DESCRIPTION OF THE DRAWINGS

[0010] **Figure 1A** depicts a first schematic of an immunoglobulin.

[0011] **Figure 1B** depicts a second schematic of an immunoglobulin.

[0012] **Figure 2** depicts a schematic of a motif for placement in an immunoglobulin.

[0013] **Figure 3** presents a diagram of steps demonstrating an exemplary process workflow for gene synthesis as disclosed herein.

[0014] **Figure 4** illustrates an example of a computer system.

CLAIMS

WHAT IS CLAIMED IS:

1. An antibody or antibody fragment comprising a variable domain, heavy chain region (VH) and a variable domain, light chain region (VL), wherein VH comprises complementarity determining regions CDRH1, CDRH2, and CDRH3, wherein VL comprises complementarity determining regions CDRL1, CDRL2, and CDRL3, and wherein (a) an amino acid sequence of CDRH1 is as set forth in any one of SEQ ID NOs: 441-619; (b) an amino acid sequence of CDRH2 is as set forth in any one of SEQ ID NOs: 620-798; (c) an amino acid sequence of CDRH3 is as set forth in any one of SEQ ID NOs: 799-977; (d) an amino acid sequence of CDRL1 is as set forth in any one of SEQ ID NOs: 978-1156; (e) an amino acid sequence of CDRL2 is as set forth in any one of SEQ ID NOs: 1157-1168; and (f) an amino acid sequence of CDRL3 is as set forth in any one of SEQ ID NOs: 1169-1347.

2. The antibody or antibody fragment of claim 1, wherein the antibody is a monoclonal antibody, a polyclonal antibody, a bi-specific antibody, a multispecific antibody, a grafted antibody, a human antibody, a humanized antibody, a synthetic antibody, a chimeric antibody, a camelized antibody, a single-chain Fvs (scFv), a single chain antibody, a Fab fragment, a F(ab′)2 fragment, a Fd fragment, a Fv fragment, a single-domain antibody, an isolated complementarity determining region (CDR), a diabody, a fragment comprised of only a single monomeric variable domain, disulfide-linked Fvs (sdFv), an intrabody, an anti-idiotypic (anti-Id) antibody, or ab antigen-binding fragments thereof.

3. The antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment thereof is chimeric or humanized.

4. The antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment has an EC50 less than about 20 nanomolar in a cAMP assay.

5. The antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment has an EC50 less than about 10 nanomolar in a cAMP assay.

6. The antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment is an agonist of GLP1R.

7. The antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment is an antagonist of GLP1R.

8. The antibody or antibody fragment of claim 1, wherein the antibody or antibody fragment is an allosteric modulator of GLP1R.

9. The antibody or antibody fragment of claim 1, wherein the VH comprises a sequence at least about 90% identical to any one of SEQ ID NOs: 58-77.

10. The antibody or antibody fragment of claim 1, wherein the VH comprises a sequence of any one of SEQ ID NOs: 58-77.

11. The antibody or antibody fragment of claim 1, wherein the VL comprises a sequence at least about 90% identical to any one of SEQ ID NOs: 92-111.

12. The antibody or antibody fragment of claim 1, wherein the VL comprises a sequence of any one of SEQ ID NOs: 92-111.

13. Use of an antibody or antibody fragment that binds GLP1R comprising a variable domain, heavy chain region (VH) and a variable domain, light chain region (VL), wherein VH comprises complementarity determining regions CDRH1, CDRH2, and CDRH3, wherein VL comprises complementarity determining regions CDRL1, CDRL2, and CDRL3, and wherein (a) an amino acid sequence of CDRH1 is as set forth in any one of SEQ ID NOs: 441-619; (b) an amino acid sequence of CDRH2 is as set forth in any one of SEQ ID NOs: 620-798; (c) an amino acid sequence of CDRH3 is as set forth in any one of SEQ ID NOs: 799-977; (d) an amino acid sequence of CDRL1 is as set forth in any one of SEQ ID NOs: 978-1156; (e) an amino acid sequence of CDRL2 is as set forth in any one of SEQ ID NOs: 1157-1168; and (f) an amino acid sequence of CDRL3 is as set forth in any one of SEQ ID NOs: 1169-1347, for the manufacture of a medicament for the treatment a metabolic disease or disorder.

14. The use of claim 13, wherein the antibody is a monoclonal antibody, a polyclonal antibody, a bi-specific antibody, a multispecific antibody, a grafted antibody, a human antibody, a humanized antibody, a synthetic antibody, a chimeric antibody, a camelized antibody, a single-chain Fvs (scFv), a single chain antibody, a Fab fragment, a F(ab′)2 fragment, a Fd fragment, a Fv fragment, a single-domain antibody, an isolated complementarity determining region (CDR), a diabody, a fragment comprised of only a single monomeric variable domain, disulfide-linked Fvs (sdFv), an intrabody, an anti-idiotypic (anti-Id) antibody, or ab antigen-binding fragments thereof.

15. The use of claim 13, wherein the antibody or antibody fragment thereof is chimeric or humanized.

16. The use of claim 13, wherein the VH comprises a sequence at least about 90% identical to any one of SEQ ID NOs: 58-77.

17. The use of claim 13, wherein the VH comprises a sequence of any one of SEQ ID NOs: 58-77.

18. The use of claim 13, wherein the VL comprises a sequence at least about 90% identical to any one of SEQ ID NOs: 92-111.

19. The use of claim 13, wherein the VL comprises a sequence of any one of SEQ ID NOs: 92-111.

20. The use of claim 13, wherein the metabolic disease or disorder is Type II diabetes or obesity.

21. An antibody or antibody fragment comprising a variable domain, heavy chain region (VH) and a variable domain, light chain region (VL), wherein VH comprises complementarity determining regions CDRH1, CDRH2, and CDRH3, wherein VL comprises complementarity determining regions CDRL1, CDRL2, and CDRL3, and wherein (a) an amino acid sequence of CDRH1 is as set forth in any one of SEQ ID NOs: 441-619; (b) an amino acid sequence of CDRH2 is as set forth in any one of SEQ ID NOs: 620-798; (c) an amino acid sequence of CDRH3 is as set forth in any one of SEQ ID NOs: 799-977; (d) an amino acid sequence of CDRL1 is as set forth in any one of SEQ ID NOs: 978-1156; (e) an amino acid sequence of CDRL2 is as set forth in any one of SEQ ID NOs: 1157-1168; and (f) an amino acid sequence of CDRL3 is as set forth in any one of SEQ ID NOs: 1169-1347 for use in therapy.