treatment of a metabolic disorder, wherein the metabolic disorder is Type II diabetes, or obesity. Provided herein are nucleic acids encoding for a protein comprising a sequence of any one of SEQ ID NOS: 2420 to 2436.

[0004a] Provided herein is an antibody as described herein for use in therapy.

[0004b] Provided herein is an antibody, wherein the antibody comprises a CDR-H3 comprising a sequence of any one of SEQ ID NOS: 2420 to 2436; and 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, a diabody, a fragment comprised of only a single monomeric variable domain, disulfide-linked Fvs (sdFv), an intrabody, or an anti-idiotypic (anti-Id) antibody.

[0005] Provided herein are nucleic acid libraries comprising a plurality of nucleic acids, wherein each nucleic acid encodes for a sequence that when translated encodes for an immunoglobulin scaffold, wherein the immunoglobulin scaffold comprises a CDR-H3 loop that comprises a GPCR binding domain, and wherein each nucleic acid comprises a sequence encoding for a sequence variant of the GPCR binding domain. Provided herein are nucleic acid libraries, wherein a length of the CDR-H3 loop is about 20 to about 80 amino acids. Provided herein are nucleic acid libraries, wherein a length of the CDR-H3 loop is about 80 to about 230 base pairs. Provided herein are nucleic acid libraries, wherein the immunoglobulin scaffold further comprises one or more domains selected from variable domain, light chain (VL), variable domain, heavy chain (VH), constant domain, light chain (CL), and constant domain, heavy chain (CH). Provided herein are nucleic acid libraries, wherein the VH domain is IGHV1-18, IGHV1-69, IGHV1-8 IGHV3-21, IGHV3-23, IGHV3-30/33rn, IGHV3-28, IGHV3-74, IGHV4-39, or IGHV4-59/61. Provided herein are nucleic acid libraries, wherein the VL domain is IGKV1-39, IGKV1-9, IGKV2-28, IGKV3-11, IGKV3-15, IGKV3-20, IGKV4-1, IGLV1-51, or IGLV2-14. Provided herein are nucleic acid libraries, wherein a length of the VH domain is about 90 to about 100 amino acids. Provided herein are nucleic acid libraries, wherein a length of the VL domain is about 90 to about 120 amino acids. Provided herein are nucleic acid libraries, wherein a length of the VH domain is about 280 to about 300 base pairs. Provided herein are nucleic acid libraries, wherein a length of the VL domain is about 300 to about 350 base pairs. Provided herein are nucleic acid libraries, wherein the library comprises at least 105 non-identical nucleic acids. Provided herein are nucleic acid libraries, wherein the immunoglobulin scaffold

comprises a single immunoglobulin domain. Provided herein are nucleic acid libraries, wherein the immunoglobulin scaffold comprises a peptide of at most 100 amino acids. Provided herein are vector libraries comprising nucleic acid libraries as described herein. Provided herein are cell libraries comprising nucleic acid libraries as described herein.

[0006] Provided herein are nucleic acid libraries comprising a plurality of nucleic acids, wherein each nucleic acid encodes for a sequence that when translated encodes a GPCR binding domain, and wherein each nucleic acid comprises sequence encoding for a different GPCR binding domain about 20 to about 80 amino acids. Provided herein are nucleic acid libraries, wherein a length of the GPCR binding domain is about 80 to about 230 base pairs. Provided herein are nucleic acid libraries, wherein the GPCR binding domain is designed based on conformational ligand interactions, peptide ligand interactions, small molecule ligand interactions, extracellular domains of GPCRs, or antibodies that target GPCRs. Provided herein are vector libraries comprising nucleic acid libraries as described herein. Provided herein are cell libraries comprising nucleic acid libraries as described herein.

[0007] Provided herein are protein libraries comprising a plurality of proteins, wherein each of the proteins of the plurality of proteins comprise an immunoglobulin scaffold, wherein the immunoglobulin scaffold comprises a CDR-H3 loop that comprises a sequence variant of a GPCR binding domain. Provided herein are protein libraries, wherein a length of the CDR-H3 loop is about 20 to about 80 amino acids. Provided herein are protein libraries, wherein the immunoglobulin scaffold further comprises one or more domains selected from variable domain, light chain (VL), variable domain, heavy chain (VH), constant domain, light chain (CL), and constant domain, heavy chain (CH). Provided herein are protein libraries, wherein the VH domain is IGHV1-18, IGHV1-69, IGHV1-8 IGHV3-21, IGHV3-23, IGHV3-30/33rn, IGHV3-28, IGHV3-74, IGHV4-39, or IGHV4-59/61. Provided herein are protein libraries, wherein the VL domain is IGKV1-39, IGKV1-9, IGKV2-28, IGKV3-11, IGKV3-15, IGKV3-20, IGKV4-1, IGLV1-51, or IGLV2-14. Provided herein are protein libraries, wherein a length of the VH domain is about 90 to about 100 amino acids. Provided herein are protein libraries, wherein a length of the VL domain is about 90 to about 120 amino acids. Provided herein are protein

libraries, wherein the plurality of proteins is used to generate a peptidomimetic library. Provided herein are protein libraries, wherein the protein library comprises peptides. Provided herein are protein libraries, wherein the protein library comprises immunoglobulins. Provided herein are protein libraries, wherein the protein library comprises antibodies. Provided herein are cell libraries comprising protein libraries as described herein.

[0008] Provided herein are protein libraries comprising a plurality of proteins, wherein the plurality of proteins comprises sequence encoding for different GPCR binding domains, and wherein the length of each GPCR binding domain is about 20 to about 80 amino acids. Provided herein are protein libraries, wherein the protein library comprises peptides. Provided herein are protein libraries, wherein the protein library comprises immunoglobulins. Provided herein are protein libraries, wherein the protein library comprises antibodies. Provided herein are protein libraries, wherein the plurality of proteins are used to generate a peptidomimetic library. Provided herein are cell libraries comprising protein libraries as described herein.

[0009] Provided herein are vector libraries comprising a nucleic acid library described herein. Provided herein are cell libraries comprising a nucleic acid library described herein. Provided herein are cell libraries comprising a protein library described herein.

CLAIMS

WHAT IS CLAIMED IS:

1. An antibody, wherein the antibody comprises a CDR-H3 comprising a sequence of any one of SEQ ID NOS: 2420 to 2436.

2. An antibody, wherein the antibody comprises a CDR-H3 comprising a sequence of any one of SEQ ID NOS: 2420 to 2436; and 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, a diabody, a fragment comprised of only a single monomeric variable domain, disulfide-linked Fvs (sdFv), an intrabody, or an anti-idiotypic (anti-Id) antibody.

3. The antibody of claim 1 or 2 for use in therapy.

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

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

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

7. The antibody or antibody fragment of claim 6, wherein the allosteric modulator of GLP1R is a negative allosteric modulator.