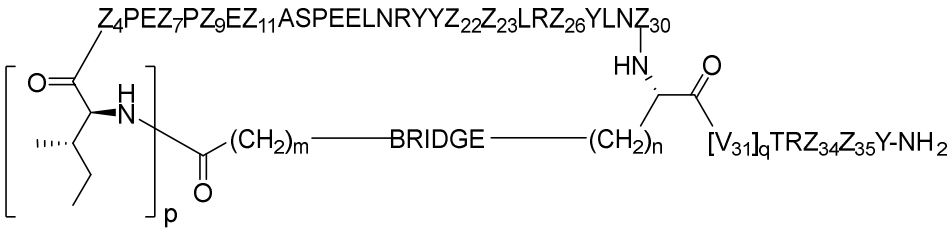
CLAIMS:

1. A conjugate comprising a monoclonal antibody or an antigen binding fragment thereof coupled to a cyclic PYY peptide, wherein the cyclic PYY peptide is represented by Formula **I** or a derivative or pharmaceutically acceptable salt thereof**:**



Formula **I**

wherein

p is 0 or 1;

m is 0, 1, 2, 3, 4, or 5;

n is 1, 2, 3, or 4;

q is 0 or 1; provided that q is 1 only when Z_{30} is absent;

BRIDGE is -Ph-CH_2-S-, -triazolyl-, -NHC(O)CH_2S-, -SCH_2C(O)NH-, -$(OCH_2CH_2)_2$NHC(O)CH_2S, -NHC(O)-, or -CH_2S-;

Z_4 is K, A, E, S, or R;

Z_7 is A or K;

Z_9 is G or K;

Z_{11} is D or K;

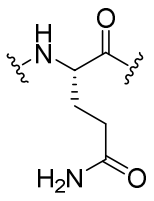
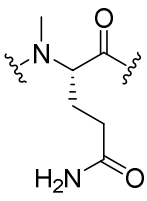
Z_{22} is A or K;

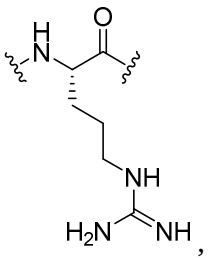
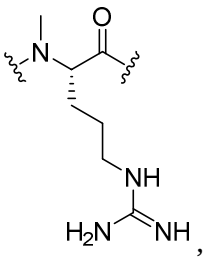
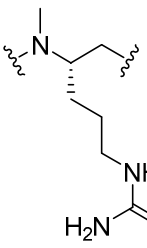
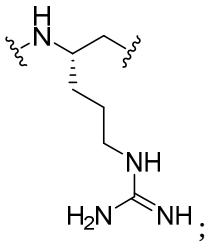
Z_{23} is S or K;

Z_{26} is A or H;

Z_{30} is L , W, absent, or K;

provided that Z_{30} is absent only when q is 1;

Z_{34} is  or ;

Z_{35} is , , , or ;

wherein the derivative is the compound of Formula **I** that is modified by one or more processes selected from the group consisting of amidation, glycosylation, carbamylation, sulfation, phosphorylation, cyclization, lipidation, and pegylation.

2. The conjugate of claim 1, wherein the cyclic PYY peptide is a compound of Formula **I** or a derivative of the cyclic PYY peptide of Formula **I** that is modified by one or more processes selected from the group consisting amidation, lipidation, and pegylation, or a pharmaceutically acceptable salt thereof.

3. The conjugate of claim 1, wherein the cyclic PYY peptide is represented by Formula **I** or the derivative or pharmaceutically acceptable salt thereof, wherein:

p is 0 or 1;

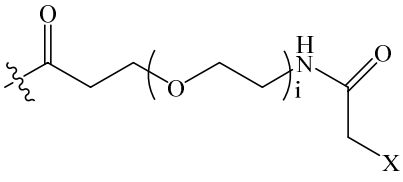
m is 0, 1, 2, 3, 4, or 5;

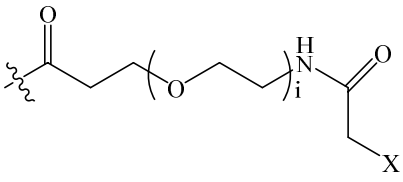
n is 1, 2, 3, or 4;

q is 0 or 1; provided that q is 1 only when Z_{30} is absent;

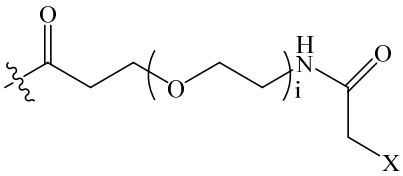
BRIDGE is -Ph-CH_2-S-, -triazolyl-, -NHC(O)CH_2S-, -SCH_2C(O)NH_2-, -$(OCH_2CH_2)_2$NHC(O)CH_2S, -NHC(O)-, or -CH_2S-;

Z_4 is K, A, E, S, or R;

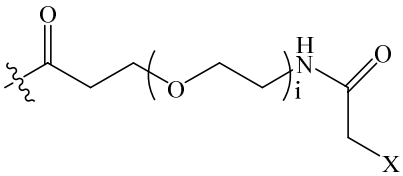
Z_7 is A or K, wherein the amino side chain of said K is optionally substituted with , wherein i is an integer of 0 to 24, and X = Br, I or Cl, -C(O)CH_2Br, -C(O)CH_2I, or -C(O)CH_2Cl;

Z_9 is G or K, wherein the amino side chain of said K is optionally substituted with , wherein i is an integer of 0 to 24, and X = Br, I or Cl, -C(O)CH_2Br, -C(O)CH_2I, or -C(O)CH_2Cl;

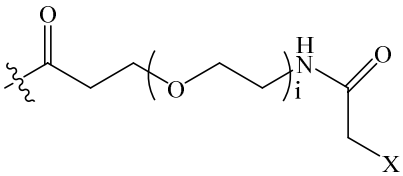
Z_{11} is D or K, wherein the amino side chain of said K is optionally substituted with

, wherein i is an integer of 0 to 24, and X = Br, I or Cl, -C(O)CH_2Br, -C(O)CH_2I, or -C(O)CH_2Cl;

Z_{22} is A or K, wherein the amino side chain of said K is optionally substituted with

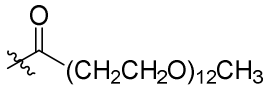
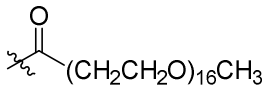
, wherein i is an integer of 0 to 24, and X = Br, I or Cl, -C(O)CH_2Br, -C(O)CH_2I, or -C(O)CH_2Cl;

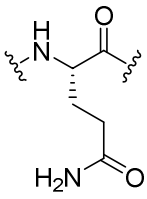
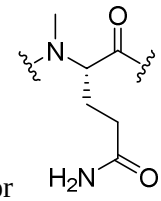
Z_{23} is S or K, wherein the amino side chain of said K is optionally substituted with

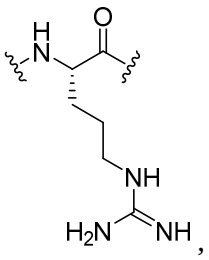
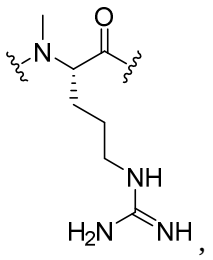
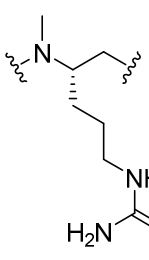
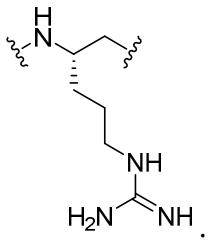
, wherein i is an integer of 0 to 24, and X = Br, I or Cl, -C(O)CH_2Br, -C(O)CH_2I, or -C(O)CH_2Cl;

Z_{26} is A or H;

Z_{30} is L or K, wherein the amino side chain of said K is substituted with

 or ;

Z_{34} is  or ; and

Z_{35} is , , , or .

4. The conjugate of claim 1, wherein the cyclic PYY peptide is represented by Formula **I** or the derivative or pharmaceutically acceptable salt thereof, wherein:

p is 0 or 1;

m is 0, 1, 2, 3, or 5;

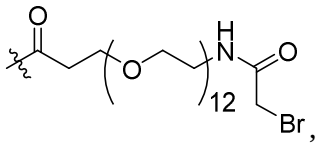
n is 1, 2, or 4;

q is 0 or 1; provided that q may be 1 only when Z_{30} is absent;

BRIDGE is -Ph-CH_2-S-, -triazolyl-, -NHC(O)CH_2S-, -$(OCH_2CH_2)_2$NHC(O)CH_2S, -NHC(O)-, or -CH_2S-;

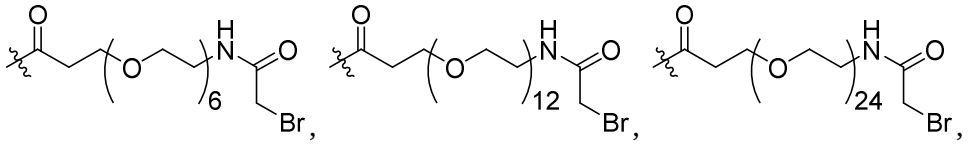
Z_4 is K, A, E, S, or R;

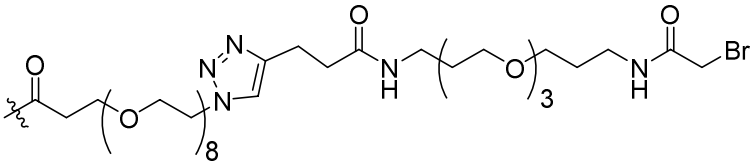
Z_7 is A or K, wherein the amino side chain of said K is substituted with



Z_9 is G or K,

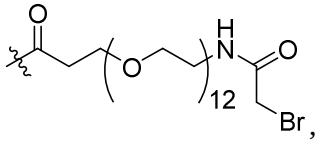
Z_{11} is D or K, wherein the amino side chain of said K is substituted with



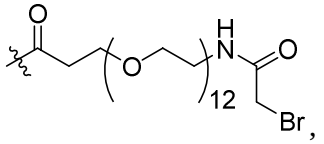


, -C(O)CH_2Br,

Z_{22} is A or K, wherein the amino side chain of said K is substituted with

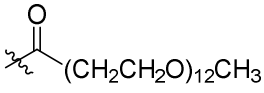
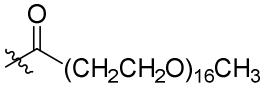


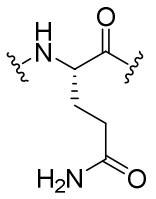
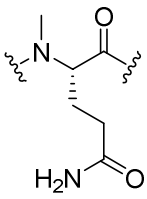
Z_{23} is S or K, wherein the amino side chain of said K is substituted with

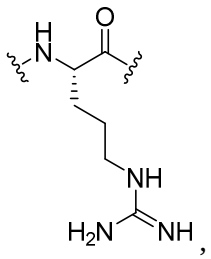
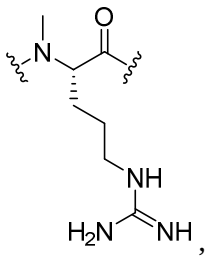
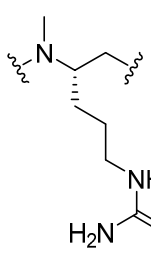
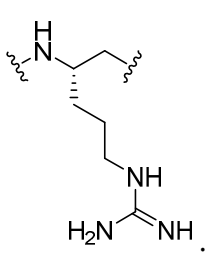


Z_{26} is A or H,

Z_{30} is L or K, wherein the amino side chain of said K is substituted with

 or ,

Z_{34} is  or ;

Z_{35} is , , , or .

5. The conjugate of claim 1, wherein the cyclic PYY peptide is selected from the group consisting of SEQ ID NOs:1, 73-100, and 147-156, or a pharmaceutically acceptable salt thereof.

6. The conjugate of any of claims 1-5, wherein the monoclonal antibody or the antigen binding fragment thereof is covalently linked to the cyclic PYY peptide at a lysine residue of the cyclic PYY peptide via a linker; optionally wherein the linker comprises one selected from the group consisting of polyethylene glycol (PEG)8-triazolyl-CH_2CH_2CO-PEG4, a PEG chain of 2-24 PEG units, an alkyl chain containing 2-10 carbon atoms, $(Gly_4Ser)_j$ wherein j = 1-4, $(AlaPro)_u$ wherein u = 1-10, and a bond.

7. The conjugate of claim 6, wherein only one of Z_7, Z9, Z_{11}, Z_{22} and Z_{23} in Formula I is lysine, and the lysine is covalently linked to an engineered cysteine residue of the monoclonal antibody or the antigen binding fragment thereof via the linker.

8. A conjugate comprising a molecule according to the following formula:

cPYY-L]$_2$-mAb

wherein:

cPYY is a cyclic PYY peptide sequence selected from the group consisting of SEQ ID NOs:102-127 or a pharmaceutically acceptable salt thereof;

L is a linker;

mAb is a monoclonal antibody or an antigen binding fragment thereof coupled to the cyclic PYY peptide via the linker; and

]$_2$ represents that 1 or 2 of the cyclic PYY peptide are covalently conjugated to the mAb.

9. The conjugate of any one of claims 1 to 8, wherein the monoclonal antibody or the antigen binding fragment thereof comprises a heavy chain complementarity determining region 1 (HCDR1), HCDR2, HCDR3, and a light chain complementarity determining region 1 (LCDR1), LCDR2, and LCDR3, having the polypeptide sequences of SEQ ID NO: 141, 142, 143, 144, 145, and 146, respectively, optionally wherein the isolated monoclonal antibody comprises a heavy chain variable domain (VH) having the polypeptide sequence of SEQ ID NO:137, and a light chain variable domain (VL) having the polypeptide sequence of SEQ ID NO:139.

10. The conjugate of claim 9, further comprising a Fc portion, optionally comprising a heavy chain (HC) having the polypeptide sequence of SEQ ID NO:138 and a light chain (LC) having the polypeptide sequence of SEQ ID NO:140.

11. A conjugate comprising a monoclonal antibody or an antigen binding fragment thereof coupled to a cyclic PYY peptide, wherein:

the monoclonal antibody or the antigen binding fragment thereof comprises a heavy chain complementarity determining region 1 (HCDR1), HCDR2, HCDR3, and a light chain complementarity determining region 1 (LCDR1), LCDR2, and LCDR3, having the polypeptide sequences of SEQ ID NO: 141, 142, 143, 144, 145, and 146, respectively, preferably the monoclonal antibody or antigen binding fragment thereof comprises a heavy chain variable domain (VH) having the polypeptide sequence of SEQ ID NO:137, and a light chain variable domain (VL) having the polypeptide sequence of SEQ ID NO:139, and more preferably, the monoclonal antibody comprises a heavy chain (HC) having the polypeptide sequence of SEQ ID NO:138 and a light chain (LC) having the polypeptide sequence of SEQ ID NO:140;

the cyclic PYY peptide comprises a polypeptide sequence selected from the group consisting of SEQ ID NOs: 1, 73-100, and 147-156, or a pharmaceutically acceptable salt thereof; and

the monoclonal antibody or antigen binding fragment thereof is conjugated to the cyclic PYY peptide at residue 7, 9, 11, 22 or 23 of the cyclic PYY peptide, preferably at lysine residue 11 of the cyclic PYY peptide, directly or via a linker.

12. A method of producing the conjugate of any one of claims 1-11, comprising reacting an electrophile, preferably bromoacetamide or maleimide, introduced onto a sidechain of the cyclic PYY peptide, preferably the sidechain of a lysine residue of the cyclic PYY peptide, with the sulfhydryl group of the cysteine residue of SEQ ID NO:143 of the monoclonal antibody or antigen-binding fragment thereof, thereby creating a covalent linkage between the cyclic PYY peptide and the monoclonal antibody or antigen-binding fragment thereof.

13. A pharmaceutical composition comprising the conjugate of any one of claims 1-11 and a pharmaceutically acceptable carrier.

14. The pharmaceutical composition of claim 13 for use in treating or preventing a disease or disorder in a subject in need thereof, wherein said disease or disorder is selected from the group consisting of obesity, type I or type II diabetes, metabolic syndrome, insulin resistance, impaired glucose tolerance, hyperglycemia, hyperinsulinemia, hypertriglyceridemia, hypoglycemia due to congenital hyperinsulinism (CHI), dyslipidemia, atherosclerosis, diabetic nephropathy, and other cardiovascular risk factors such as hypertension and cardiovascular risk factors related to unmanaged cholesterol and/or lipid levels, osteoporosis, inflammation, non-alcoholic fatty liver disease (NAFLD), non-alcoholic steatohepatitis (NASH), renal disease, and eczema, wherein an effective amount of the pharmaceutical composition is to be administered to the subject in need thereof.

15. The pharmaceutical composition of claim 13 for use in reducing food intake in a subject in need thereof, wherein an effective amount of the pharmaceutical composition is to be administered to the subject in need thereof.

16. The pharmaceutical composition of claim 13 for use in modulating Y2 receptor activity in a subject in need thereof, wherein an effective amount of the pharmaceutical composition is to be administered to the subject in need thereof.

17. The pharmaceutical composition for use according to any one of claims 14-16, wherein the pharmaceutical composition is to be administered via an injection and/or in a combination with at least one antidiabetic agent.

18. The pharmaceutical composition for use according to claim 17, wherein said antidiabetic agent is a glucagon-like-peptide-1 receptor modulator or the pharmaceutical composition is to be administered in combination with liraglutide.

19. A kit comprising the conjugate of any one of claims 1-11, preferably further comprising a liraglutide and a device for injection.

20. A method of producing a pharmaceutical composition comprising the conjugate of any one of claims 1-11, comprising combining the conjugate with a pharmaceutically acceptable carrier to obtain the pharmaceutical composition.