**What is claimed:**

1. A peptide comprising the sequence of SEQ ID NO: 184,

$HX_2X_3GTFTSDX_{10}SKYLDX_{16}RX_{18}AX_{20}X_{21}FVQWLX_{27}X_{28}X_{29}GPSSGX_{35}PPPS$

wherein:

$X_2$ is AIB;

$X_3$ is Gln or Gln analog;

$X_{10}$ is Tyr or an amino acid covalently attached to a C12 to C18 acyl or alkyl group;

$X_{16}$ is any amino acid;

$X_{18}$ is Arg or Ala;

$X_{20}$ is negative charged amino acid or a charge-neutral amino acid;

$X_{21}$ is an acidic amino acid;

$X_{27}$ is Leu, Ala, Nle, or Met;

$X_{28}$ is Ala or an acidic amino acid;

$X_{29}$ is Ala or Gly;

$X_{35}$ is Ala or a basic amino acid;

wherein, when $X_{28}$ is an acidic amino acid, $X_{35}$ is a basic amino acid;

wherein, when $X_{10}$ is Tyr, the peptide comprises at position 40 an amino acid covalently attached to a C12 to C18 acyl or alkyl group, and

wherein the C-terminal amino acid of the peptide is amidated.

2. The peptide of claim 1, wherein $X_{10}$ is Tyr and the amino acid at position 40 is an amino acid covalently attached to a C12 to C18 acyl or alkyl group.

3. The peptide of claim 2, further comprising Gly at position 41.

4. The peptide of claim 1, wherein $X_{10}$ is an amino acid covalently attached to a C12-C18 acyl or alkyl group.

5. The peptide of any one of claims 1 to 4, wherein the amino acid at position 16 of the peptide is a negative charged amino acid or an α,α-disubstituted amino acid.

6. The peptide of claim 5, wherein the negative charged amino acid is Glu.

7. The peptide of claim 5, wherein the α,α-disubstituted amino acid comprises R1 and R2, each of which is bonded to the alpha carbon, wherein each of R1 and R2 is independently selected from the group consisting of C1-C4 alkyl, optionally substituted with a hydroxyl, amide, thiol, halo, or R1 and R2 together with the alpha carbon to which they are attached form a ring.

8. The peptide of claim 7, wherein the alpha, alpha disubstituted amino acid is AIB.

9. The peptide of any one of claims 1 to 8, wherein $X_{20}$ is Gln.

10. The peptide of claim 9, wherein the amino acid at position 16 is a negative charged amino acid and $X_{20}$ is Gln.

11. The peptide of claim 10, wherein $X_{18}$ is Ala.

12. The peptide of claim any one of claims 1 to 8, wherein $X_{20}$ is AIB.

13. The peptide of claim 12, wherein $X_{16}$ is any amino acid other than AIB.

14. The peptide of any one of claims 1 to 13, wherein $X_{28}$ is an acidic amino acid and $X_{35}$ is a basic amino acid.

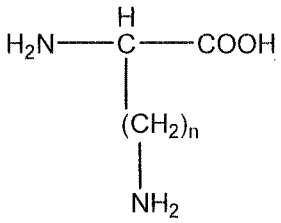
15. The peptide of claim 14, wherein the acidic amino acid is Asp or Glu and/or the basic amino acid is Arg or Lys.

16. The peptide of any one of claims 1 to 15, wherein at least one amino acid C-terminal to the amino acid at position 27 is a charged amino acid.

17. The peptide of claim 16, wherein the charged amino acid is at position 28.

18. The peptide of claim 17, wherein the charged amino acid is Asp.

19. The peptide of claim 17, wherein the charged amino acid is an amino acid of Formula I:

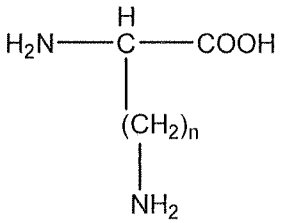


wherein n = 1 to 4.

20. The peptide of claim 19, wherein the amino acid of Formula I is Lys.

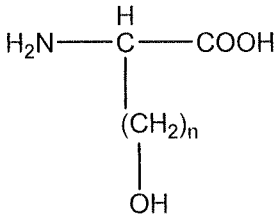
21. The peptide of any one of claims 1 to 20, wherein the amino acid covalently attached to a C12 to C18 acyl or alkyl group is attached to a C14 or C16 fatty acyl group.

22. The peptide of any one of claims 1 to 21, wherein the amino acid covalently attached to a C12 to C18 acyl or alkyl group is Tyr, amino-Phe, or an amino acid comprising a structure of Formula I, Formula II, or Formula III, attached to a C12 to C18 acyl or alkyl group, wherein each of Formulae I to III is:



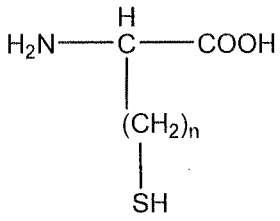
wherein n = 1 to 4

[Formula I];



wherein n = 1 to 4

[Formula II]; and



wherein n = 1 to 4

[Formula III].

23. The peptide of claim 22, wherein the amino acid of Formula I is Lys, the amino acid of Formula II is Cys, or the amino acid of Formula III is Ser.

24. The peptide of any one of claims 1 to 22, wherein the C12 to C18 acyl or alkyl group is covalently liked to the amino acid via a spacer 3 to 10 atoms in length.

25. The peptide of claim 24, wherein the spacer is an amino acid or dipeptide.

26. The peptide of claim 25, wherein the spacer comprises two acidic amino acid residues.

27. The peptide of claim 1, comprising the sequence of SEQ ID NO: 179,

$HX_2QGTFTSDX_{10}SKYLDERX_{18}AX_{20}X_{21}FVQWLLDGGPSSGAPPPSX_{40}X_{41}$

wherein:

$X_2$ is AIB;

$X_{10}$ is Tyr or an amino acid covalently attached to a C12 to C18 acyl or alkyl group;

$X_{18}$ is Ala;

$X_{20}$ is AIB or Gln;

$X_{21}$ is Asp or Glu;

$X_{40}$ is an amino acid covalently bound to a C12 to C18 acyl or alkyl group, with the proviso that when the amino acid at position 10 is an amino acid covalently bound to a C12 to C18 acyl or alkyl group, $X_{40}$ is a bond;

$X_{41}$ is Gly when $X_{40}$ is an amino acid covalently bound to a C12 to C18 acyl or alkyl group, with the proviso when $X_{40}$ is other than an amino acid covalently bound to a C12 to C18 acyl, no amino acid is present at position 41;

wherein the C-terminal amino acid of the peptide is amidated.

28. The peptide of claim 1, comprising an amino acid sequence selected from the group consisting of: SEQ ID NOs: 28, 89, and 90.

29. A peptide comprising the sequence of SEQ ID NO: 179,

$HX_2QGTFTSDX_{10}SKYLDERX_{18}AX_{20}X_{21}FVQWLLDGGPSSGAPPPSX_{40}X_{41}$

wherein:

$X_2$ is AIB;

$X_{10}$ is Tyr or an amino acid covalently attached to a C10 to C26 acyl or alkyl group;

$X_{18}$ is Arg or Ala;

$X_{20}$ is AIB or Gln;

$X_{21}$ is Asp or Glu;

$X_{40}$ is absent or is Gly (e.g. when position 10 is not Tyr) or is an amino acid covalently bound to a C10-C26 acyl or alkyl group;

$X_{41}$ is optionally present, when residue at position 40 is an amino acid covalently bound to C10-C26 acyl or alkyl group then $X_{41}$ is Gly;

wherein the C-terminal amino acid of the peptide is amidated.

30. A dimer or multimer comprising two or more peptides of any one of the preceding claims.

31. A conjugate comprising a peptide of any one of the preceding claims and a conjugate moiety.

32. A fusion peptide comprising a peptide of any one of the preceding claims fused to a heterologous peptide.

33. A pharmaceutical composition comprising a peptide of any one of claims 1 to 29, a dimer or multimer of claim 30, a conjugate of claim 31, a fusion peptide of claim 32, or a combination thereof, and a pharmaceutically acceptable carrier, diluent, or excipient.

34. A peptide of any one of claims 1 to 29, a dimer or multimer of claim 30, a conjugate of claim 31, a fusion peptide of claim 32, or a combination thereof, for use in reducing weight gain or inducing weight loss in a subject in need thereof.

35. A peptide of any one of claims 1 to 29, a dimer or multimer of claim 30, a conjugate of claim 31, a fusion peptide of claim 32, or a combination thereof, for use in treating diabetes in a subject in need thereof.

36. Use of a peptide of any one of claims 1 to 29, a dimer or multimer of claim 30, a conjugate of claim 31, a fusion peptide of claim 32, or a combination thereof, in the manufacture of a medicament for reducing weight gain or inducing weight loss in a subject in need thereof.

37. Use of a peptide of any one of claims 1 to 29, a dimer or multimer of claim 30, a conjugate of claim 31, a fusion peptide of claim 32, or a combination thereof, in the manufacture of a medicament for treating diabetes in a subject in need thereof.

**What is claimed:**

1. A peptide comprising the sequence of

(a) SEQ ID NO: 184,

$HX_2X_3GTFTSDX_{10}SKYLDX_{16}RX_{18}AX_{20}X_{21}FVQWLX_{27}X_{28}X_{29}GPSSGX_{35}PPPS$

(SEQ ID NO: 184)

wherein:

$X_2$ is AIB;

$X_3$ is Gln or Gln analog;

$X_{10}$ is Tyr or an amino acid covalently attached to a C12 to C18 acyl or alkyl group;

$X_{16}$ is any amino acid;

$X_{18}$ is Arg or Ala;

$X_{20}$ is negative charged amino acid or a charge-neutral amino acid;

$X_{21}$ is an acidic amino acid;

$X_{27}$ is Leu, Ala, Nle, or Met;

$X_{28}$ is Ala or an acidic amino acid;

$X_{29}$ is Ala or Gly;

$X_{35}$ is Ala or a basic amino acid;

wherein, when $X_{28}$ is an acidic amino acid, $X_{35}$ is a basic amino acid;

wherein, when $X_{10}$ is Tyr, the peptide comprises at position 40 an amino acid covalently attached to a C12 to C18 acyl or alkyl group, and

wherein the C-terminal amino acid of the peptide is amidated;

or

(b) SEQ ID NO: 184 with up to 3 amino acid modifications relative to SEQ ID NO: 184, which peptide (i) retains His at position 1, (ii) retains an amino acid covalently attached to a C12 to C18 acyl or alkyl group at position 10 or position 40 and (iii) comprises AIB or d-Ser at position 2;

wherein the peptide exhibits agonist activity at each of the human GIP receptor, and the human GLP-1 receptor and, optionally, the human glucagon receptor, wherein the EC50 of peptide at each of the human GIP receptor and human GLP-1 receptor is about 1 nM or less.

2. The peptide of claim 1, wherein X10 is Tyr and the amino acid at position 40 is an amino acid covalently attached to a C12 to C18 acyl or alkyl group.

3. The peptide of claim 2, further comprising Gly at position 41.

4. The peptide of claim 1, wherein X10 is an amino acid covalently attached to a C12-C18 acyl or alkyl group.

5. The peptide of any one of claims 1 to 4, wherein the amino acid at position 16 of the peptide is a negative charged amino acid or an α,α-disubstituted amino acid.

6. The peptide of claim 5, wherein the negative charged amino acid is Glu.

7. The peptide of claim 5, wherein the α,α-disubstituted amino acid comprises R1 and R2, each of which is bonded to the alpha carbon, wherein each of R1 and R2 is independently selected from the group consisting of C1-C4 alkyl, optionally substituted with a hydroxyl, amide, thiol, halo, or R1 and R2 together with the alpha carbon to which they are attached form a ring.

8. The peptide of claim 7, wherein the alpha, alpha disubstituted amino acid is AIB.

9. The peptide of any one of claims 1 to 8, wherein X20 is Gln.

10. The peptide of claim 9, wherein the amino acid at position 16 is a negative charged amino acid and X20 is Gln.

11. The peptide of claim 10, wherein X18 is Ala.

12. The peptide of claim any one of claims 1 to 8, wherein X20 is AIB.

13. The peptide of claim 12, wherein X16 is any amino acid other than AIB.

14. The peptide of any one of claims 1 to 13, wherein X28 is an acidic amino acid and X35 is a basic amino acid.

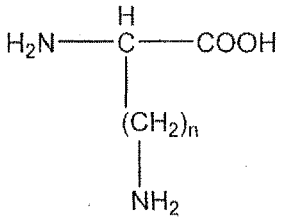
15. The peptide of claim 14, wherein the acidic amino acid is Asp or Glu and/or the basic amino acid is Arg or Lys.

16. The peptide of any one of claims 1 to 15, wherein at least one amino acid C-terminal to the amino acid at position 27 is a charged amino acid.

17. The peptide of claim 16, wherein the charged amino acid is at position 28.

18. The peptide of claim 17, wherein the charged amino acid is Asp.

19. The peptide of claim 17, wherein the charged amino acid is an amino acid of Formula I:

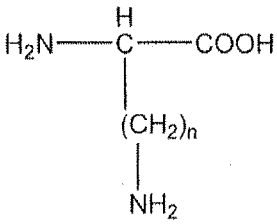


wherein n = 1 to 4.

20. The peptide of claim 18, wherein the amino acid of Formula I is Lys.

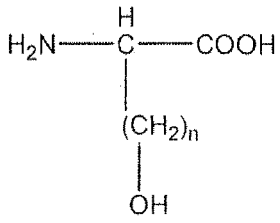
21. The peptide of any one of claims 1 to 20, wherein the amino acid covalently attached to a C12 to C18 acyl or alkyl group is attached to a C14 or C16 fatty acyl group.

22. The peptide of any one of claims 1 to 21, wherein the amino acid covalently attached to a C12 to C18 acyl or alkyl group is Tyr, amino-Phe, or an amino acid comprising a structure of Formula I, Formula II, or Formula III, attached to a C12 to C18 acyl or alkyl group, wherein each of Formulae I to III is:



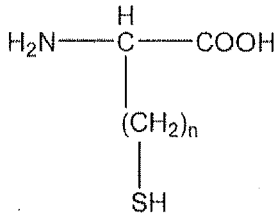
wherein n = 1 to 4

[Formula I];



wherein n = 1 to 4

[Formula II]; and



wherein n = 1 to 4

[Formula III].

23. The peptide of claim 22, wherein the amino acid of Formula I is Lys, the amino acid of Formula II is Cys, or the amino acid of Formula III is Ser.

24. The peptide of any one of claims 1 to 22, wherein the C12 to C18 acyl or alkyl group is covalently liked to the amino acid via a spacer 3 to 10 atoms in length.

25. The peptide of claim 24, wherein the spacer is an amino acid or dipeptide.

26. The peptide of claim 25, wherein the spacer comprises two acidic amino acid residues.

27. The peptide of claim 1, comprising the sequence of SEQ ID NO: 184 with up to 3 amino acid modifications relative to SEQ ID NO: 184, wherein $X_3$ of the peptide is an acidic, basic, or hydrophobic amino acid.

28. The peptide of claim 27, wherein $X_3$ is Glu, Orn, or Nle.

29. The peptide of claim 1, comprising the sequence of SEQ ID NO: 184 with up to 3 amino acid modifications relative to SEQ ID NO: 184, wherein $X_{27}$ of the peptide is Val or Lys.

30. The peptide of claim 1, comprising the sequence of SEQ ID NO: 184 with up to 3 amino acid modifications relative to SEQ ID NO: 184, wherein the modifications are substitutions at position(s) 2, 3, 12, 17, 18, 24, 27, 28, and/or 29.

31. The peptide of claim 30, comprising Ile at position 12, Gln at position 17, and/or Asn at position 24.

32. The peptide of claim 1, comprising the sequence of SEQ ID NO: 184 with up to 3 amino acid modifications relative to SEQ ID NO: 184, wherein the amino acid modifications are conservative substitutions.

33. The peptide of claim 1, comprising an amino acid sequence selected from the group consisting of: SEQ ID NOs: 27, 28, 33, 35, 36, 37, 38, 39, 41, 79, 80, 89, 90, 146, 148, 153, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 171, 176, 177, 203, 204, 205, 207, 212, 262, 263 and 264.

34. A dimer or multimer comprising two or more peptides of any one of the preceding claims.

35. A conjugate comprising a peptide of any one of the preceding claims and a conjugate moiety.

36. A fusion peptide comprising a peptide of any one of the preceding claims fused to a heterologous peptide.

37. A pharmaceutical composition comprising a peptide of any one of claims 1 to 33, a dimer or multimer of claim 34, a conjugate of claim 35, a fusion peptide of claim 36, or a combination thereof, and a pharmaceutically acceptable carrier, diluent, or excipient.

38. A peptide of any one of claims 1 to 33, a dimer or multimer of claim 34, a conjugate of claim 35, a fusion peptide of claim 36, or a combination thereof, for use in reducing weight gain or inducing weight loss in a subject in need thereof.

39. A peptide of any one of claims 1 to 33, a dimer or multimer of claim 36, a conjugate of claim 37, a fusion peptide of claim 38, or a combination thereof, for use in treating diabetes in a subject in need thereof.

40. Use of a peptide of any one of claims 1 to 33, a dimer or multimer of claim 34, a conjugate of claim 35, a fusion peptide of claim 36, or a combination thereof, in the manufacture of a medicament for reducing weight gain or inducing weight loss in a subject in need thereof.

41. Use of a peptide of any one of claims 1 to 33, a dimer or multimer of claim 34, a conjugate of claim 35, a fusion peptide of claim 36, or a combination thereof, in the manufacture of a medicament for treating diabetes in a subject in need thereof.