

Claims

1. A glucose-dependent insulintropic peptide (GIP) analogue
consisting of amino acid sequence SEQ ID NO:1:

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3 - 4 - 5 - 6 7 8 9 10 11 12 13 14 15 16 17
X₁ - G - T - F - I - S - D - Y - S - I - A - M - D - K - I

10

18 19 20 21 22 23 24 25 26 27 28 29 30
H - Q - Q - D - F - V - N - W - L - L - A - Q - K - Z,

wherein X₁ is any amino acid or omitted;

or a functional variant thereof, wherein said variant has 1 to 8 individual amino acid substitutions at any amino acid of SEQ ID NO:1,

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wherein N at position 24 of SEQ ID NO:1, or a functional variant thereof, is substituted with E and/or wherein A at position 13 of SEQ ID NO:1, or a functional variant thereof, is substituted with 2-Aminoisobutyric acid (Aib), wherein Z is a peptide comprising one or more amino acid residues of the C-terminus of Exendin-4(31-39) (PSSGAPPPS; SEQ ID NO:67; CE31-39) or is omitted, and

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wherein said peptide is modified by attaching one fatty acid molecule at one amino acid residue at any position of SEQ ID NO 1 or said functional variant thereof or at one amino acid residue at any position of Z SEQ ID NO:67; CE31-39.

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2. A GIP analogue consisting of an amino acid sequence selected from the group consisting of:

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3 - 4 - 5 - 6 7 8 9 10 11 12 13 14 15 16 17
X₁ - G - T - F - I - S - D - Y - S - I - A - M - D - K - I

18 19 20 21 22 23 24 25 26 27 28 29 30
H - Q - Q - D - F - V - E - W - L - L - A - Q - K - Z,
(SEQ ID NO:2),

3 - 4 - 5 - 6 7 8 9 10 11 12 13 14 15 16 17
X₁ - G - T - F - I - S - D - Y - S - I -Aib - M - D - K - I
 18 19 20 21 22 23 24 25 26 27 28 29 30
 5 **H - Q - Q - D - F - V - N - W - L - L - A - Q - K - Z,**
 (SEQ ID NO:3), and

3 - 4 - 5 - 6 7 8 9 10 11 12 13 14 15 16 17
X₁ - G - T - F - I - S - D - Y - S - I -Aib - M - D - K - I
 10 18 19 20 21 22 23 24 25 26 27 28 29 30
H - Q - Q - D - F - V - E - W - L - L - A - Q - K - Z,
 (SEQ ID NO:4),

wherein X₁ is any amino acid or omitted;
 15 or a functional variant thereof, wherein said variant has 1 to 8 individual amino acid substitutions at any amino acid of SEQ ID NO:2 (except E at position 24); of SEQ ID NO:3 (except Aib at position 13); and of SEQ ID NO:4 (except Aib at position 13 and E at position 24);
 wherein Z is a peptide comprising one or more amino acid residues of the C-terminus of Exendin-4(31-39) (PSSGAPPPS; SEQ ID NO:67; CE31-39), and
 20 wherein said peptide is modified by attaching one fatty acid molecule at one amino acid residue at any position of SEQ ID NO:2-4, or said functional variant thereof, or at one amino acid residue at any position of Z SEQ ID NO:67; CE31-39.

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3. The GIP peptide analogue according to any one of the preceding claims, wherein said GIP peptide analogue is an antagonist of GIPR.
4. The GIP peptide analogue according to any one of the preceding claims, wherein the GIP peptide analogue has improved solubility as compared to GIP(3-30) and/or as compared to AT364 (SEQ ID NO:6) at pH 7 to 9, such as at pH 7 to 8.5, such as at pH 7.0 to 8.0 or pH 7.5 to 8.5.

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5. The GIP peptide analogue according to any one of the preceding claims,
wherein the GIP peptide analogue has an aqueous solubility of at least 1 mg/ml,
such as at least 5 mg/ml, such as at least 7.5 mg/ml, such as at least 10 mg/ml,
such as at least 15 mg/ml.
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6. The GIP peptide analogue according to any one of the preceding claims,
wherein the GIP peptide analogue has an aqueous solubility at pH between 7 to
9, such as around pH 7.5 or around 8., of at least 1 mg/ml, such as at least 5
mg/ml, such as at least 7.5 mg/ml, such as at least 10 mg/ml, such as at least
10 15 mg/ml.
7. The GIP peptide analogue according to any one of the preceding claims,
wherein the GIP peptide analogue has improved physical stability as measured
by a fibrillation lag time in a ThT assay of more than about 24 hours, such as a
15 fibrillation lag time in a ThT assay of more than about 50 hours, such as a
fibrillation lag time in a ThT assay of more than about 96 hours, such as a
fibrillation lag time in a ThT assay of more than about 168 hours.
8. The GIP peptide analogue according to any one of the preceding claims,
20 wherein the GIP peptide analogue has improved physical stability as compared
to GIP(3-30) and/or as compared to AT364 (SEQ ID NO:6) at pH 7 to 9, such
as at pH 7 to 8.5, such as at pH 7.0 to 8.0 or pH 7.5 to 8.5.
9. The GIP peptide analogue according to any one of the preceding claims,
25 wherein said peptide is modified by attaching one fatty acid molecule at one
amino acid residue at positions 3 to 29 of any one of SEQ ID Nos:1-4, or said
functional variant thereof.
10. The GIP peptide analogue according to any one of the preceding claims,
30 wherein said GIP peptide analogue inhibits GIPR activity of at least 80%, such
as of at least 85%, such as of at least 90%, such as of at least 95%, such as of
about 100%.
11. The GIP peptide analogue according to any one of the preceding claims,
35 wherein said GIP peptide analogue inhibits GIPR activity of at least 80%, such
as of at least 85%, such as of at least 90%, such as of at least 95%, such as of
about 100%, wherein inhibition of GIPR activity is determined as a decrease in

intracellular cAMP.

12. The GIP peptide analogue according to any one of the preceding claims,
wherein said GIP peptide analogue has a GIPR antagonistic potency
5 corresponding to an IC₅₀ value of less than 50 nM, such as an IC₅₀ value of
less than 10 nM, such as an IC₅₀ value of less than 5 nM, such as an IC₅₀
value of less than 1 nM, such as an IC₅₀ value of between 0.001 nM to 1 nM.
13. The GIP peptide analogue according to any one of the preceding claims,
10 wherein:
- the amino acid at position 3 is selected from E, glutaric acid, succinic acid and
adipic acid;
the amino acid at position 9 is selected from D and E;
15 the amino acid at position 11 is selected from S, K and A;
the amino acid at position 12 is selected from I and K;
the amino acid at position 13 is selected from A, 2-Aminoisobutyric acid (Aib)
and K;
the amino acid at position 14 is selected from M, L and Nle;
20 the amino acid at position 15 is selected from D and E;
the amino acid at position 16 is selected from K and R;
the amino acid at position 17 is selected from I and K;
the amino acid at position 18 is selected from H and K;
the amino acid at position 20 is selected from Q and K;
25 the amino acid at position 21 is selected from D and E;
the amino acid at position 24 is selected from N, Q and E;
the amino acid at position 34 if present is selected from P and K; and/or
the amino acid at position 40 if present is K or is absent.
14. The GIP peptide analogue according to any one of the preceding claims,
30 wherein:
- the amino acid at position 4 is G;
the amino acid at position 5 is T;
35 the amino acid at position 6 is F;
the amino acid at position 7 is I;

the amino acid at position 22 is F;
the amino acid at position 23 is V;
the amino acid at position 25 is W;
the amino acid at position 26 is L; and/or
5 the amino acid at position 27 is L.

15. The GIP peptide analogue according to any one of the preceding claims,
wherein said functional variant has 1 individual amino acid substitution, such as
2 individual amino acid substitutions, for example 3 individual amino acid
10 substitutions, such as 4 individual amino acid substitutions at any amino acid
residue of any one of SEQ ID Nos:1-4, or such as 1 to 4 individual amino acid
substitutions at any amino acid residue of any one of SEQ ID Nos:1-4.

16. The GIP peptide analogue according to any one of the preceding claims,
15 wherein said functional variant has 1 to 2 individual amino acid substitutions,
such as 2 to 3 individual amino acid substitutions, such as 3 to 4 individual
amino acid substitutions, such as 4 to 5 individual amino acid substitutions,
such as 5 to 6 individual amino acid substitutions, such as 6 to 7 individual
amino acid substitutions, such as 7 to 8 individual amino acid substitutions at
20 any amino acid residue of any one of SEQ ID Nos:1-4.

17. The GIP peptide analogue according to any one of the preceding claims,
wherein said functional variant has 1 individual amino acid substitution, such as
2 individual amino acid substitutions, for example 3 individual amino acid
25 substitutions, such as 4 individual amino acid substitutions at any amino acid
residue of any one of SEQ ID Nos:1-4, wherein said substitutions are
conservative amino acid substitutions.

18. The GIP peptide analogue according to any one of the preceding claims,
30 wherein said variant has 1 to 7 individual amino acid substitutions, such as 1
individual amino acid substitutions, such as 2 individual amino acid
substitutions, such as 3 individual amino acid substitutions, such as 4 individual
amino acid substitutions, such as 5 individual amino acid substitutions, such as
6 individual amino acid substitutions, such as 7 individual amino acid
35 substitutions at any one of amino acid residues 3 to 30 of any one of SEQ ID
Nos:1-4.

19. The GIP peptide analogue according to any one of the preceding claims,
wherein at least one amino acid residue of the GIP peptide analogue of any one
of SEQ ID Nos:1-4 is substituted with E, such as wherein at least one amino
acid residue at any one of positions 9, 15, and 21 of any one of SEQ ID NOs:1-
4 is substituted with E.
20. The GIP peptide analogue according to any one of the preceding claims,
wherein x_1 is an amino acid residue selected from the group consisting of E,
glutaric acid, succinic acid and adipic acid.
21. The GIP peptide analogue according to any one of the preceding claims,
wherein x_1 is E.
22. The GIP peptide analogue according to any one of the preceding claims,
wherein x_1 is glutaric acid.
23. The GIP peptide analogue according to any one of the preceding claims,
wherein x_1 is succinic acid.
24. The GIP peptide analogue according to any one of the preceding claims,
wherein x_1 is adipic acid.
25. The GIP peptide analogue according to any one of the preceding claims,
wherein the D at position 9 of any one of SEQ ID Nos:1-4, or a functional
variant thereof, is substituted with any amino acid, such as substituted with E.
26. The GIP peptide analogue according to any one of the preceding claims,
wherein the S at position 11 of any one of SEQ ID Nos:1-4, or a functional
variant thereof, is substituted with any amino acid, such as a conservative
amino acid substitution or such as substituted with an amino acid residue
selected from the group consisting of A, and K.
27. The GIP peptide analogue according to any one of the preceding claims,
wherein the I at position 12 of any one of SEQ ID Nos:1-4, or a functional

variant thereof, is substituted with any amino acid, such as a conservative amino acid substitution, or such as substituted with K.

- 5 28. The GIP peptide analogue according to any one of the preceding claims, wherein the A at position 13 of SEQ ID NO:1 and SEQ ID NO:2, or a functional variant thereof, is substituted with any amino acid, such as a conservative amino acid substitution, such as substituted with 2-Aminoisobutyric acid (Aib) or K.
- 10 29. The GIP peptide analogue according to any one of the preceding claims, wherein the M at position 14 of any one of SEQ ID Nos:1-4, or a functional variant thereof, is substituted with any amino acid, such as a conservative amino acid substitution, such as substituted with an amino acid residue selected from the group consisting of L and Norleucine (Nle).
- 15 30. The GIP peptide analogue according to any one of the preceding claims, wherein the D at position 15 of any one of SEQ ID NOS:1-4, or a functional variant thereof, is substituted with any amino acid, such as a conservative amino acid substitution, such as substituted with E.
- 20 31. The GIP peptide analogue according to any one of the preceding claims, wherein the K at position 16 of any one of SEQ ID NOS:1-4, or a functional variant thereof, is substituted with any amino acid, such as a conservative amino acid substitution, such as substituted with R.
- 25 32. The GIP peptide analogue according to any one of the preceding claims, wherein the I at position 17 of any one of SEQ ID NOS:1-4, or a functional variant thereof, is substituted with any amino acid, such as a conservative amino acid substitution, such as substituted with K.
- 30 33. The GIP peptide analogue according to any one of the preceding claims, wherein the H at position 18 of any one of SEQ ID NOS:1-4, or a functional variant thereof, is substituted with any amino acid, such as a conservative amino acid substitution, such as substituted with K.

34. The GIP peptide analogue according to any one of the preceding claims,
wherein the Q at position 20 of any one of SEQ ID NOs:1-4, or a functional
variant thereof, is substituted with any amino acid, such as a conservative
amino acid substitution or such as substituted with K.
35. The GIP peptide analogue according to any one of the preceding claims,
wherein the D at position 21 of any one of SEQ ID NOs:1-4, or a functional
variant thereof, is substituted with any amino acid, such as a conservative
amino acid substitution, such as substituted with E.
36. The GIP peptide analogue according to any one of the preceding claims,
wherein the N at position 24 of SEQ ID NO:1 and SEQ ID NO:3, or a functional
variant thereof, is substituted with any amino acid, such as a conservative
amino acid substitution, such as substituted with Q or such as substituted with
E.
37. The GIP peptide analogue according to any one of the preceding claims,
wherein said GIP peptide analogue comprises at least one substitution to K and
one substitution to E or Aib at any one of amino acid residues 3 to 30 of any
one of SEQ ID NOs:1-4.
38. The GIP peptide analogue according to any one of the preceding claims,
wherein Z consists of one or more amino consecutive acid residues of the C-
terminus of Exendin-4(31-39) (PSSGAPPPS; SEQ ID NO:67; CE31-39).
39. The GIP peptide analogue according to any one of the preceding claims,
wherein Z consists of one or more amino consecutive acid residues of the C-
terminus of Exendin-4(30-39) (GPSSGAPPPS; SEQ ID NO:67; CE30-39).
40. The GIP peptide analogue according to any one of the preceding claims,
wherein Z comprises at least one G or one P.

41. The GIP peptide analogue according to any one of the preceding claims, wherein Z comprises at least two P.
- 5 42. The GIP peptide analogue according to any one of the preceding claims, wherein Z is a peptide selected from the group consisting of
- a glycine or a proline,
 - GP, GPS, GPSS, GPSSG, GPSSGA, GPSSGAP, GPSSGAPP, GPSSGAPPP and GPSSGAPPPS,
 - 10 - PS, PSS, PSSG, PSSGA, PSSGAP, PSSGAPP, PSSGAPPP and PSSGAPPPS,
 - GPSSGA, GPSSGAP, GPSSGAPP, GPSSGAPPP, GPSSGAPPPS, or a variant thereof comprising 1 or 2 individual amino acid substitutions at any one of the amino acid residues, and
 - 15 - PSSG, PSSGA, PSSGAP, PSSGAPP, PSSGAPPP and PSSGAPPPS, or a variant thereof comprising 1 or 2 individual amino acid substitutions at any one of the amino acid residues.
- 20 43. The GIP peptide analogue according to any of the preceding claims, wherein the fatty acid molecule is not attached at the amino acid residue at position 3 or the N-terminal amino group of the amino acid residue at position 3 of any one of SEQ ID Nos:1-4, or a functional variant thereof.
- 25 44. The GIP peptide analogue according to any of the preceding claims, wherein the GIP peptide analogue has a free N-terminus.
- 30 45. The GIP peptide analogue according to any of the preceding claims, wherein the fatty acid molecule is attached to the side chain of an amino acid residue at position 11, position 12, position 13, position 16, position 17, position 18, position 20, position 34 if present or position 40 if present of said GIP peptide analogue, such as of any one of SEQ ID Nos:1-4, or a functional variant thereof.
- 35 46. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule is attached to an amino acid residue at any one of

positions 12, 13, 16, 17, 18, position 34 if present or position 40 if present of any one of SEQ ID Nos:1-4, or a functional variant thereof.

- 5 47. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule is attached to an amino acid residue at position 18 of any one of SEQ ID Nos:1-4, or a functional variant thereof.
- 10 48. The GIP peptide analogue according to any of the preceding claims, wherein a fatty acid molecule is attached to the epsilon-amino group of a K residue of said GIP peptide analogue, such as of any one of SEQ ID Nos:1-4, or a functional variant thereof comprising at least one K residue.
- 15 49. The GIP peptide analogue according to any of the preceding claims, wherein a fatty acid molecule is attached to the side chain amino group of the amino acid residue at position 18 of any one of SEQ ID Nos:1-4, or a functional variant thereof, wherein H at position 18 has been substituted with K or Orn in any one of SEQ ID Nos:1-4, or a functional variant thereof.
- 20 50. The GIP peptide analogue according to any of the preceding claims, wherein a fatty acid molecule is attached to the side chain amino group of the amino acid residue at position 11 of SEQ ID NO:1, or a functional variant thereof, wherein S at position 11 has been substituted with K or Orn in SEQ ID NO:1.
- 25 51. The GIP peptide analogue according to any of the preceding claims, wherein a fatty acid molecule is attached to the side chain amino group of the amino acid residue at position 12 of any one of SEQ ID Nos:1-4, or a functional variant thereof, wherein I at position 12 has been substituted with K or Orn in any one of SEQ ID Nos:1-4.
- 30 52. The GIP peptide analogue of any one of the preceding claims, wherein said GIP peptide analogue has an amino acid sequence selected from the group consisting of:
EGTFISEYSAibANleEKIKQQDFVEWLLAQK – Z; SEQ ID NO:70; GIP(3-30)
[D9E;I12Aib;M14Nle;D15E;H18K;N24E],
35 EGTFISEYSIAibMEKIKQQDFVEWLLAQK – Z; SEQ ID NO:72; GIP(3-30)

- [D9E;A13Aib;D15E;H18K;N24E],
EGTFISDYSIAMDKIKQQDFVEWLLAQK – Z; SEQ ID NO:46; GIP(3-30)
[H18K;N24E],
EGTFISDYSIAibMDKIKQQDFVEWLLAQK – Z; SEQ ID NO:73; GIP(3-30)
5 [A13Aib;H18K;N24E],
EGTFISDYSIAibLDKIKQQDFVEWLLAQK – Z; SEQ ID NO:74; GIP(3-30)
[A13Aib;M14L;H18K;N24E],
EGTFISDYSIAibNIeDKIKQQDFVEWLLAQK – Z; SEQ ID NO:75; GIP(3-30)
[A13Aib;M14Nle;H18K;N24E],
10 EGTIFISDYSIALDKIKQQDFVEWLLAQK – Z; SEQ ID NO:76; GIP(3-30)
[M14L;H18K;N24E],
EGTFISDYSIANIeDKIKQQDFVEWLLAQK – Z; SEQ ID NO:77; GIP(3-30)
[M14Nle;H18K;N24E],
EGTFISDYSIAKDKIKQQDFVEWLLAQK – Z; SEQ ID NO:78; GIP(3-30)
15 [M14K;H18K;N24E],
EGTFISEYSIAibLEKIKQQEFVEWLLAQK – Z; SEQ ID NO:79; GIP(3-30)
[D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
EGTFISEYSIAibNIeEKIKQQEFVEWLLAQK – Z; SEQ ID NO:80; GIP(3-30)
[D9E;A13Aib;M14Nle;D15E;H18K;D21E;N24E],
20 EGTIFISEYSIALEKIKQQEFVEWLLAQK – Z; SEQ ID NO:81; GIP(3-30)
[D9E;M14L;D15E;H18K;D21E;N24E],
EGTFISEYSIANIeEKIKQQEFVEWLLAQK – Z; SEQ ID NO:82; GIP(3-30)
[D9E;M14Nle;D15E;H18K;D21E;N24E],
XGTIFISDYSIANIeDKIKQQDFVEWLLAQK – Z; SEQ ID NO:83; GIP(3-30)
25 [E3Glutaric acid(X);M14Nle;H18K;N24E],
EGTFISEYSIAibLEKIKQQDFVEWLLAQK – Z; SEQ ID NO:84; GIP(3-30)
[D9E; A13Aib; M14L;D15E;H18K;N24E]
XGTIFISEYSIAibLEKIKQQEFVEWLLAQK – Z; SEQ ID NO:85; GIP(3-30)
[E3Glutaric acid;D9E;A13Aib; M14L;D15E;H18K;D21E;N24E],
30 XGTIFISEYSIAibNIeEKIKQQEFVEWLLAQK – Z; SEQ ID NO:86; GIP(3-30)
[E3Glutaric acid;D9E;A13Aib; M14Nle;D15E;H18K;D21E;N24E],
XGTIFISEYSIALEKIKQQEFVEWLLAQK – Z; SEQ ID NO:87; GIP(3-30)
[E3Glutaric acid;D9E; M14L;D15E;H18K;D21E;N24E],
XGTIFISEYSIAibMEKIKQQEFVEWLLAQK – Z; SEQ ID NO:88; GIP(3-30)
35 [E3Glutaric acid;D9E;A13Aib;D15E;H18K;D21E;N24E],

EGTFISEYSIA**Aib**MEKIKQQEFVEWLLAQK – Z; SEQ ID NO:89; GIP(3-30)[D9E;A13Aib;D15E;H18K;D21E;N24E],EGTFISEYSIAM**EKIK**QQEFVEWLLAQK – Z; SEQ ID NO:90; GIP(3-30) [D9E;D15E;H18K;D21E;N24E],

EGTFISEYSIA**Aib**L**DKIK**QQDFVEWLLAQK – Z; SEQ ID NO:91; GIP(3-30)

5 [D9E;A13Aib; M14L;H18K;N24E]

XGTFISDYSIA**Aib**MDKIKQQDFVEWLLAQK – Z; SEQ ID NO:92; GIP(3-30) [E3Glutaric acid;A13Aib;H18K;N24E],

EGTFISDYSKAMDKIHQQDFVEWLLAQK – Z; SEQ ID NO:93; GIP(3-30) [I12K;N24E],

10 EGT**FISDYSIK**MDKIHQQDFVEWLLAQK – Z; SEQ ID NO:94 ; GIP(3-30) [A13K;N24E],

EGTFISDYSIAMDKIHQQDFVEWLLAQK – Z; SEQ ID NO:95; GIP(3-30) [N24E],

EGTFISDYSIAMDKKHQQDFVEWLLAQK – Z; SEQ ID NO:96; GIP(3-30)

15 [I17K;N24E],

EGTFISDYSIAMDKIHQQDFVEWLLAQKPSSKAPPPS; SEQ ID NO:40; GIP(3-30)[N24E]CEX(31-39)[34K],

EGTFISDYSIAMDKIHQQDFVEWLLAQKPSSGAPPPS; SEQ ID NO:41; GIP(3-30)[N24E]CEX(31-39)[40K],

20 EGT**FISDYAI**AMDKKHQQDFVEWLLAQK – Z; SEQ ID NO:97; GIP(3-30) [S11A;H18K;N24E],

EGTFISEYSIA**Aib**MEKIKQQDFVEWLLAQK – Z; SEQ ID NO:72; GIP(3-30) [D9E,A13Aib;D15E;H18K;N24E],

XGTFISEYSIA**Aib**LEKIKQQEFVEWLLAQK – Z; SEQ ID NO:98; GIP(3-30)

25 [E3Succinic acid;D9E;A13Aib; M14L;D15E;H18K;D21E;N24E],

XGTFISEYSIA**Aib**LEKIKQQEFVEWLLAQK – Z; SEQ ID NO:99; GIP(3-30) [E3Adipic acid;D9E;A13Aib; M14L;D15E;H18K;D21E;N24E],

EGTFISDYSIA**Aib**MDKIKQQDFVNWLLAQK – Z; SEQ ID NO:100; GIP(3-30) [A13Aib;H18K],

30 XGTFISDYSIAMDKIKQQDFVEWLLAQK – Z; SEQ ID NO:101 ; GIP(3-30) [E3Glutaric acid;H18K;N24E], and

XGTFISDYSIA**Aib**MDKIKQQDFVNWLLAQK – Z; SEQ ID NO:102; GIP(3-30) [E3Glutaric acid;A13Aib;H18K].

53. The GIP peptide analogue of any one of the preceding claims, wherein said peptide is C-terminally amidated ($-\text{NH}_2$) or C-terminally carboxylated ($-\text{COOH}$).
54. The GIP peptide analogue of any one of the preceding claims, wherein said peptide is C-terminally carboxylated ($-\text{COOH}$).
55. The GIP peptide analogue of any one of the preceding claims, wherein said fatty acid molecule is a straight-chain fatty acid.
56. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule is a branched fatty acid.
57. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule is a monoacyl fatty acid molecule, comprising one fatty acid.
58. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule is a diacyl fatty acid molecule.
59. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises an acyl group of the formula $\text{CH}_3(\text{CH}_2)_n\text{CO}-$, wherein n is an integer from 4 to 24.
60. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises one or more acyl groups selected from the group consisting of $\text{CH}_3(\text{CH}_2)_6\text{CO}-$, $\text{CH}_3(\text{CH}_2)_8\text{CO}-$, $\text{CH}_3(\text{CH}_2)_{10}\text{CO}-$, $\text{CH}_3(\text{CH}_2)_{12}\text{CO}-$, $\text{CH}_3(\text{CH}_2)_{14}\text{CO}-$, $\text{CH}_3(\text{CH}_2)_{16}\text{CO}-$, $\text{CH}_3(\text{CH}_2)_{18}\text{CO}-$, $\text{CH}_3(\text{CH}_2)_{20}\text{CO}-$ and $\text{CH}_3(\text{CH}_2)_{22}\text{CO}-$.
61. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises an acyl group selected from the group consisting of $\text{CH}_3(\text{CH}_2)_{10}\text{CO}-$ (lauryl, C12), $\text{CH}_3(\text{CH}_2)_{12}\text{CO}-$ (myristoyl, C14), $\text{CH}_3(\text{CH}_2)_{14}\text{CO}-$ (palmitoyl, C16), $\text{CH}_3(\text{CH}_2)_{16}\text{CO}-$ (stearyl, C18), $\text{CH}_3(\text{CH}_2)_{18}\text{CO}-$ (arachidyl, C20) and $\text{CH}_3(\text{CH}_2)_{20}\text{CO}-$ (behenyl, C22).

62. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises two acyl groups individually selected from the group consisting of $\text{HOOC-CH}_3(\text{CH}_2)_{10}\text{CO-}$ (dodecanoyl, C12), $\text{HOOC-CH}_3(\text{CH}_2)_{12}\text{CO-}$ (1-tetradecanoyl, C14), $\text{HOOC-CH}_3(\text{CH}_2)_{14}\text{CO-}$ (hexadecanoyl, C16), $\text{HOOC-CH}_3(\text{CH}_2)_{15}\text{CO-}$ (15-carboxy-pentadecanoyl, C17), $\text{HOOC-CH}_3(\text{CH}_2)_{16}\text{CO-}$ (octadecanoyl, C18), $\text{HOOC-CH}_3(\text{CH}_2)_{17}\text{CO-}$ (17-carboxy-heptadecanoyl, C19), $\text{HOOC-CH}_3(\text{CH}_2)_{18}\text{CO-}$ (eicosanoyl, C20), $\text{HOOC-CH}_3(\text{CH}_2)_{19}\text{CO-}$ (19-carboxy-nonadecanoyl, C21) and $\text{HOOC-CH}_3(\text{CH}_2)_{20}\text{CO-}$ (behenyl, C22).
63. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises an acyl group of the formula $\text{COOH}(\text{CH}_2)_n\text{CO-}$ (dicarboxylic acid), wherein n is an integer from 4 to 24.
64. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises an acyl group selected from the group consisting of $\text{COOH}(\text{CH}_2)_{14}\text{CO-}$, $\text{COOH}(\text{CH}_2)_{16}\text{CO-}$, $\text{COOH}(\text{CH}_2)_{18}\text{CO-}$ and $\text{COOH}(\text{CH}_2)_{20}\text{CO-}$.
65. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises or consists of $\text{COOH}(\text{CH}_2)_{14}\text{CO-}$.
66. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises or consists of $\text{COOH}(\text{CH}_2)_{16}\text{CO-}$.
67. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule comprises or consists of $\text{COOH}(\text{CH}_2)_{18}\text{CO-}$.
68. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule is attached to the epsilon amino group of the side chain of an amino acid residue of said GIP peptide analogue directly.
69. The GIP peptide analogue according to any of the preceding claims, wherein said fatty acid molecule is attached to an amino acid residue via a linker.

70. The GIP peptide analogue according to any of the preceding claims, wherein the fatty acid molecule is attached to an amino acid residue via a linker in such a way that a carboxyl group of the fatty acid molecule forms an amide bond with an amino group of the linker.

5

71. The GIP peptide analogue according to any of the preceding claims, wherein said linker comprises one or more moieties individually selected from the group consisting of:

- a. one or more an α,ω -amino acids,
- 10 b. one or more amino acids selected from the group consisting of succinic acid, Lys, Glu, Asp,
- c. 4-Abu,
- d. γ -aminobutyric acid
- 15 e. a dipeptide, such as a dipeptide wherein the C-terminal amino acid residue is Lys, His or Trp, preferably Lys, and wherein the N-terminal amino acid residue is selected from the group comprising Ala, Arg, Asp, Asn, Gly, Glu, Gln, Ile, Leu, Val, Phe and Pro, such as Gly-Lys,
- 20 f. one or more of γ -aminobutanoyl (γ -aminobutyric acid), γ -glutamyl (γ -glutamic acid), β -asparagyl, β -alanyl and glycyl, and
- g. γ -glutamic acid – [8-amino-3,6-dioxaoctanoic acid]_n (γ Glu-AEEAc_n), wherein n is an integer between 1 and 50, such as an integer between 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-20, 20-25, 25-30, 30-35, 35-40, 40-45, 45-25 50.

72. The GIP peptide analogue according to any of the preceding claims, wherein said linker comprises one or more moieties individually selected from the group consisting of:

- 30 a. α -amino acid, γ -amino acid or ω -amino acid,
- b. one or more amino acids selected from the group consisting of succinic acid, Lys, Glu, Asp,
- c. one or more amino acids selected from the group consisting of Gly and Ser,

- d. one or more amino acids selected from the group consisting of Ala, Glu, Lys and Leu,
- e. one or more of γ -aminobutanoyl (γ -aminobutyric acid), γ -Glu (γ -glutamic acid), β -Asp (β -asparagyl), β -Ala (β -alanyl), 2-aminoisobutyric acid (Aib) and Gly, and
- f. [8-amino-3,6-dioxaoctanoic acid]_n (AEEAc_n), wherein n is an integer between 1 and 50, such as an integer between 1-4, 1-3 or 1-2.
73. The GIP peptide analogue of any one of the preceding claims, wherein said linker comprises a γ -Glu, one or more 8-amino-3,6-dioxaoctanoic acid (AEEAc), or combinations thereof.
74. The GIP peptide analogue of any one of the preceding claims, wherein said linker comprises or consists of SGGG.
75. The GIP peptide analogue of any one of the preceding claims, wherein said linker comprises or consists of AEEL.
76. The GIP peptide analogue of any one of the preceding claims, wherein said linker comprises or consists of 2-aminoisobutyric acid (Aib).
77. The GIP peptide analogue of any one of the preceding claims, wherein said linker comprises or consists of γ Glu.
78. The GIP peptide analogue of any one of the preceding claims, wherein said linker comprises or consists of KAAAEKAAAEKAAAE.
79. The GIP peptide analogue of any one of the preceding claims, wherein said linker comprises or consists of a [8-amino-3,6-dioxaoctanoic acid]_n (AEEAc)_n, wherein n is an integer between 1 and 50, such as an integer between 1-2, 2-3, 3-4, 4-5, 5-6, 6-7, 7-8, 8-9, 9-10, 10-11, 11-12, 12-13, 13-14, 14-15, 15-20, 20-25, 25-30, 30-35, 35-40, 40-45, 45-50, preferably wherein n is 1, 2 or 3.
80. The GIP peptide analogue of any one of the preceding claims, wherein said linker comprises or consists of a γ -Glu and one AEEAc, such as a γ -Glu and two AEEAc, for example a γ -Glu and three AEEAc.

81. The GIP peptide analogue of any one of the preceding claims, wherein the fatty acid molecule is attached to an amino acid residue via a linker, and wherein the combination of linker and fatty acid is selected from the group consisting of:

- | | |
|----|---|
| | i. Hexadecanoyl-γ-Glu- |
| 5 | ii. Hexadecanoyl-γ-Glu-γ-Glu- |
| | iii. Hexadecanoyl-γ-Glu-AEEAc- |
| | iv. Hexadecanoyl-γ-Glu-AEEAc-AEEAc- |
| | v. Hexadecanoyl-γ-Glu-AEEAc-AEEAc-AEEAc- |
| | vi. [15-carboxy-pentadecanoyl]-γ-Glu- |
| 10 | vii. [15-carboxy-pentadecanoyl]-γ-Glu-γ-Glu- |
| | viii. [15-carboxy-pentadecanoyl]-γ-Glu-AEEAc- |
| | ix. [15-carboxy-pentadecanoyl]-γ-Glu-AEEAc-AEEAc- |
| | x. [15-carboxy-pentadecanoyl]-γ-Glu-AEEAc-AEEAc- AEEAc- |
| | xi. Octadecanoyl-γ-Glu- |
| 15 | xii. Octadecanoyl-γ-Glu-γ-Glu- |
| | xiii. Octadecanoyl-γ-Glu-AEEAc- |
| | xiv. Octadecanoyl-γ-Glu-AEEAc-AEEAc- |
| | xv. Octadecanoyl-γ-Glu-AEEAc-AEEAc-AEEAc- |
| | xvi. [17-carboxy-heptadecanoyl]-γ-Glu- |
| 20 | xvii. [17-carboxy-heptadecanoyl]-γ-Glu-γ-Glu- |
| | xviii. [17-carboxy-heptadecanoyl]-γ-Glu-AEEAc- |
| | xix. [17-carboxy-heptadecanoyl]-γ-Glu-AEEAc-AEEAc- |
| | xx. [17-carboxy-heptadecanoyl]-γ-Glu-AEEAc-AEEAc- AEEAc- |
| | xxi. Eicosanoyl-γ-Glu- |
| 25 | xxii. Eicosanoyl-γ-Glu-γ-Glu- |
| | xxiii. Eicosanoyl-γ-Glu-AEEAc- |
| | xxiv. Eicosanoyl-γ-Glu-AEEAc-AEEAc- |
| | xxv. Eicosanoyl-γ-Glu-AEEAc-AEEAc-AEEAc- |
| | xxvi. [19-carboxy-nonadecanoyl]-γ-Glu- |
| 30 | xxvii. [19-carboxy-nonadecanoyl]-γ-Glu-γ-Glu- |
| | xxviii. [19-carboxy-nonadecanoyl]-γ-Glu-AEEAc- |
| | xxix. [19-carboxy-nonadecanoyl]-γ-Glu-AEEAc-AEEAc-, and |
| | xxx. [19-carboxy-nonadecanoyl]-γ-Glu-AEEAc-AEEAc- AEEAc-. |

82. The GIP peptide analogue of any one of the preceding claims, wherein the fatty acid molecule is attached to an amino acid residue via a linker, and wherein the combination of linker and fatty acid is selected from the group consisting of:

- i. [15-Carboxy pentadecanoyl]-yGlu
- 5 ii. [17-carboxy-heptadecanoyl]-γ-Glu-AEEAc-AEEAc-, and
- iii. [17-carboxy-heptadecanoyl]-yGlu-yGlu

83. The GIP peptide analogue of any one of the preceding claims selected from the group consisting of:

- 10 EGTFISEYSIAMEKIKQQDFVEWLLAQKPSSGAPPPS- C16-diacid/18K; SEQ ID NO:10; GIP(3-30)+Cex(31-39) [D9E;D15E;H18K;N24E],
EGTFISEYSAibANleEKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:71; GIP(3-30)+Cex(31-39) [D9E;I12Aib;M14Nle;D15E;H18K;N24E],
EGTFISEYSAibMEKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID
- 15 NO:33; GIP(3-30)+Cex(31-39) [D9E;A13Aib;D15E;H18K;N24E],
EGTFISDYSIAMDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:47; GIP(3-30)+Cex(31-39) [H18K;N24E],
EGTFISDYSIAibMDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:12; GIP(3-30)+Cex(31-39) [A13Aib;H18K;N24E],
- 20 EGTIFSDYSIAibLDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:13; GIP(3-30)+Cex(31-39) [A13Aib;M14L;H18K;N24E],
EGTFISDYSIAibLDKIKQQDFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:13; GIP(3-30)+Cex(31-39) [A13Aib;M14L;H18K;N24E],
EGTFISDYSIAibNleDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ
- 25 ID NO:14; GIP(3-30)+Cex(31-39) [A13Aib;M14Nle;H18K;N24E],
EGTFISDYSIAibNleDKIKQQDFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:14; GIP(3-30)+Cex(31-39) [A13Aib;M14Nle;H18K;N24E],
EGTFISDYSIALDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:15; GIP(3-30)+Cex(31-39) [M14L;H18K;N24E],
- 30 EGTIFSDYSIALDKIKQQDFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:15; GIP(3-30)+Cex(31-39) [M14L;H18K;N24E],
EGTFISDYSIANleDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:16; GIP(3-30)+Cex(31-39) [M14Nle;H18K;N24E],
EGTFISDYSIANleDKIKQQDFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-
- 35 diacid/18K; SEQ ID NO:16; GIP(3-30)+Cex(31-39) [M14Nle;H18K;N24E],

- EGTFISDYSIAKDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:17; GIP(3-30)+Cex(31-39) [M14K;H18K;N24E],
- EGTFISEYSIAibLEKIKQQEFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:18; GIP(3-30)+Cex(31-39) [D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
- 5 EGTFISEYSIAibLEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:18; GIP(3-30)+Cex(31-39) [D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
- EGTFISEYSIAibNleEKIKQQEFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:19; GIP(3-30)+Cex(31-39) [D9E;A13Aib;M14Nle;D15E;H18K;D21E;N24E],
- 10 EGTFISEYSIAibNleEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:19; GIP(3-30)+Cex(31-39) [D9E;A13Aib;M14Nle;D15E;H18K;D21E;N24E],
- XGTFISDYSIAMDKIKQQDFVNWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:20; GIP(3-30)+Cex(31-39) [E3Glutaric acid(X);H18K],
- 15 EGTFISEYSIALEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:21; GIP(3-30)+Cex(31-39) [D9E;M14L;D15E;H18K;D21E;N24E],
- EGTFISEYSIANleEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:22; GIP(3-30)+Cex(31-39) [D9E;M14Nle;D15E;H18K;D21EN24E],
- 20 XGTFISDYSIANleDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID NO:24; GIP(3-30)+Cex(31-39) [E3Glutaric acid(X);M14Nle;H18K;N24E],
- XGTFISDYSIANleDKIKQQDFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:24; GIP(3-30)+Cex(31-39) [E3Glutaric acid(X);M14Nle;H18K;N24E],
- 25 XGTFISEYSIAibLEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:25; GIP(3-30)+Cex(31-39) [E3Glutaric acid;D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
- XGTFISEYSIAibNleEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:26; GIP(3-30)-Cex(31-39) [E3Glutaric acid;D9E;A13Aib;M14Nle;D15E;H18K;D21E;N24E],
- 30 XGTFISEYSIALEKIKQQEFVEWLLAQKPSSGAPPPS-OH-2xAEEAc+yGlu-C18-diacid/18K; SEQ ID NO:27; GIP(3-30)Cex(31-39) [E3Glutaric acid;D9E;M14L;D15E;H18K;D21E;N24E],
- 35 XGTFISEYSIAibMEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-

- diacid/18K; SEQ ID NO:28; GIP(3-30)-Cex(31-39) [E3Glutaric acid;D9E;A13Aib;D15E;H18K;D21E;N24E],
EGTFISEYSIA**Aib**MEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEAAc+yGlu-C18-
diacid/18K; SEQ ID NO:29; GIP(3-30)-Cex(31-39)
5 [D9E;A13Aib;D15E;H18K;D21E;N24E],
EGTFISEYSIA**Aib**MEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEAAc+yGlu-C18-
diacid/18K; SEQ ID NO:9; GIP(3-30)Cex(31-39) [D9E;D15E;H18K;D21E;N24E],
EGTFISEYSIA**Aib**LDKIKQQDFVEWLLAQKPSSGAPPPS-2xAEAAc+yGlu-C18-
diacid/18K; SEQ ID NO:30; GIP(3-30)Cex(31-39) [D9E;A13Aib; M14L;H18K;N24E],
10 **XGTFISEYSIAib**LEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEAAc+yGlu-C18-
diacid/18K; SEQ ID NO:25; GIP(3-30)Cex(31-39) [E3Glutaric
acid;D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
EGTFISEYSIA**Aib**LEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEAAc+yGlu-C18-
diacid/18K; SEQ ID NO:18; GIP(3-30)Cex(31-39)
15 [D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
XGTFISDYSIAibMDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID
NO:32; GIP(3-30)Cex(31-39) [E3Glutaric acid;A13Aib;H18K;N24E],
EGTFISEYSIA**Aib**MEKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID
NO:33; GIP(3-30)Cex(31-39) [D9E;A13Aib;D15E;H18K;N24E],
20 **XGTFISEYSIAib**LEKIKQQEFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID
NO:25; GIP(3-30)Cex(31-39) [E3Glutaric
acid;D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
EGTFISEYSIA**Aib**LEKIKQQEFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID
NO:21; GIP(3-30)Cex(31-39) [D9E;M14L;D15E;H18K;N24E],
25 EGTFISEYSIA**Aib**LEKIKQQEFVEWLLAQKPSSGAPPPS-(GGGS-C16-diacid/18K);
SEQ ID NO:18; GIP(3-30)Cex(31-39) [D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
EGTFISEYSIA**Aib**LEKIKQQEFVEWLLAQKPSSGAPPPS-(ALEA-C16-diacid/18K);
SEQ ID NO:18; GIP(3-30)Cex(31-39) [D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
EGTFISDYSKAMDKIHQQDFVEWLLAQKPSSGAPPPS-C16-diacid/12K; SEQ ID
30 NO:36; GIP(3-30)Cex(31-39) [I12K;N24E],
EGTFISDYSIKMDKIHQQDFVEWLLAQKPSSGAPPPS-C16-diacid/13K; SEQ ID
NO:37; GIP(3-30)Cex(31-39) [A13K;N24E],
EGTFISDYSIAMDKIHQQDFVEWLLAQKPSSGAPPPS-C16-diacid/16K; SEQ ID
NO:38; GIP(3-30)Cex(31-39) [N24E],
35 EGTFISDYSIAMDKKHQQDFVEWLLAQKPSSGAPPPS-C16-diacid/17K; SEQ ID

- NO:39; GIP(3-30)Cex(31-39) [I17K;N24E],
EGTFISDYSIAMDKIHQQDFVEWLLAQKPSSKAPPPS C16-diacid/34K; SEQ ID
NO:40; GIP(3-30)Cex(31-39) [N24E;34K],
EGTFISDYSIAMDKIHQQDFVEWLLAQKPSSGAPPPSK-C16-diacid/40K; SEQ ID
5 NO:41; GIP(3-30)Cex(31-39) [N24E;40K],
EGTFISDYAIAMDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID
NO:43; GIP(3-30)Cex(31-39) [S11A;H18K;N24E],
EGTFISDYSIAMDKIKQQDFVEWLLAQK-C16-diacid/18K; SEQ ID NO:46; GIP(3-
30) [H18K;N24E],
10 EGTIFSDYSIAMDKIKQQDFVEWLLAQKPSSGAPPPS-C20-diacid/18K; SEQ ID
NO:47; GIP(3-30)Cex(31-39)-OH [H18K;N24E],
EGTFISDYSIAMDKIKQQDFVEWLLAQKPSSGAPPPS-C16/18K; SEQ ID NO:47;
GIP(3-30)Cex(31-39) [H18K;N24E],
EGTFISEYSIAibLEKIKQQDFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-
15 diacid/18K; SEQ ID NO:50; GIP(3-30)Cex(31-39) [D9E;A13Aib;
M14L;D15E;H18K;N24E],
XGTIFISEYSIAibNleEKIKQQEFVEWLLAQKPSSGAPPPS-C16-diacid/18K); SEQ
ID NO:26; GIP(3-30)Cex(31-39) [E3Glutaric
acid;D9E;A13Aib;M14Nle;D15E;H18K;D21E;N24E],
20 EGTIFISEYSIAibLEKIKQQEFVEWLLAQKPSSGAPPPS-(Aib-C16-diacid/18K);
SEQ ID NO:18; GIP(3-30)Cex(31-39) [D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
EGTFISEYSIAibLEKIKQQEFVEWLLAQKPSSGAPPPS-(KAAAEKAAAEKAAAE-
C16-diacid/18K); SEQ ID NO:18; GIP(3-30)Cex(31-39)
[D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
25 XGTIFISEYSIAibLEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-
diacid/18K; SEQ ID NO:48; GIP(3-30)Cex(31-39) [E3Succinic
acid;D9E;A13Aib;M14L;D15E;H18K;D21E;N24E],
XGTIFISEYSIAibLEKIKQQEFVEWLLAQKPSSGAPPPS-2xAEEAc+yGlu-C18-
diacid/18K; SEQ ID NO:49; GIP(3-30)Cex(31-39) [E3Adipic acid;D9E;A13Aib;
30 M14L;D15E;H18K;D21E;N24E],
EGTFISDYSIAibMDKIKQQDFVNWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID
NO:52; GIP(3-30)Cex(31-39) [A13Aib;H18K],
XGTIFISDYSIAMDKIKQQDFVEWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID
NO:53; GIP(3-30)Cex(31-39) [E3Glutaric acid;H18K;N24E], and
35 XGTIFISDYSIAibMDKIKQQDFVNWLLAQKPSSGAPPPS-C16-diacid/18K; SEQ ID

NO:54; GIP(3-30)Cex(31-39) [E3Glutaric acid;A13Aib;H18K],

84. The GIP peptide analogue according to any of the preceding claims for use in a method of inhibiting or reducing one or more of i) GIP-induced glucagon secretion, ii) GIP-induced insulin secretion, iii) GIP-induced somatostatin secretion, iv) GIP-induced glucose uptake, v) GIP-induced fatty acid synthesis and/or fatty acid incorporation, vi) high or increased expression or activity of a GIPR, vii) post-prandial GIP release, viii) serum levels of free fatty acids and/or triglycerides, ix) GIP-induced appetite increases, x) GIP-induced reduction in energy expenditure, xi) GIP-induced increase in absorption of nutrients from the gut, xii) GIP-induced decrease in GLP-1's appetite suppressive effect, xiii) GIP-induced leptin resistance.
85. The GIP peptide analogue according to any of the preceding claims for use in a method of treating a condition selected from the group consisting of metabolic syndrome, obesity, pre-diabetes, type I diabetes, type 2 diabetes, insulin resistance, elevated fasting glucose, hyperglycemia, elevated fasting serum triglyceride levels, low levels of very low-density lipoprotein (VLDL) , low high-density lipoprotein (HDL) levels, dyslipidemia, increased/decreased low-density lipoprotein (LDL), high cholesterol levels, abnormal deposition of lipids, a cardiovascular disease, elevated blood pressure and atherosclerosis.