

CLAIMS

The invention claimed is:

1. A compound comprising:
YX₂QGTX₆TSDX₁₀SIX₁₃LDX₁₆X₁₇AQX₂₀X₂₁FIX₂₄X₂₅LLEGGPSSGEPPX₃₉,
wherein X₂ is Aib,
X₆ is αMeF(2F),
X₁₀ can be Y or 4Pal,
X₁₃ can be L or αMeL,
X₁₆ is Orn,
X₁₇ is any amino acid with a functional group available for conjugation and
the functional group is conjugated to a C₁₆-C₂₂ fatty acid moiety,
X₂₀ can be 4Pal, Iva or αMeL,
X₂₁ can be A or Aib,
X₂₄ can be E or e,
X₂₅ can be Y or αMeY, and
X₃₉ can be E or S
(SEQ ID NO:5), and
wherein a carboxy-terminal (C-terminal) amino acid optionally is amidated;
or a pharmaceutically acceptable salt thereof.
2. The compound of Claim 1, wherein the amino acid with a functional group available
for conjugation at position X₁₇ is selected from the group consisting of C, D, E, K and Q
3. The compound of Claim 1, wherein the amino acid with a functional group available
for conjugation at position X₁₇ is K.
4. The compound of any one of Claims 1 to 3, wherein the amino acid with the
functional group available for conjugation at position X₁₇ and the C₁₆-C₂₂ fatty acid moiety
are conjugated by a linker between the amino acid and the fatty acid moiety.
5. The compound of Claim 4, wherein the linker comprises one to four amino acids.

6. The compound of Claim 5, wherein the amino acids are E or γ E.
7. The compound of any one of Claims 4 to 6, wherein the linker further comprises the following structure:
$$\text{H}-\{\text{NH}-\text{CH}_2-\text{CH}_2-[\text{O}-\text{CH}_2-\text{CH}_2]_m-\text{O}-(\text{CH}_2)_p-\text{CO}\}_n-\text{OH},$$

wherein m is any integer from 1 to 12, n is any integer from 1 to 12, and p is 1 or 2.
8. The compound of any one of Claims 4 to 7, wherein the linker further comprises one to four (2-[2-(2-amino-ethoxy)-ethoxy]-acetyl) moieties.
9. The compound of Claim 1, wherein X_{17} is K chemically modified through conjugation to an epsilon-amino group of a K side-chain with the following structure:
$$(2-[2-(2\text{-amino-ethoxy})\text{-ethoxy}]\text{-acetyl})_a-(\gamma\text{E})_b-\text{CO}-(\text{CH}_2)_c-\text{CO}_2\text{H},$$

wherein a is 0, 1 or 2; b is 1 or 2; and c is an integer between 16 to 20.
10. The compound of Claim 9, wherein a is 1.
11. The compound of Claim 9, wherein a is 2.
12. The compound of any one of Claims 9 to 11, wherein b is 1.
13. The compound of any one of Claims 9 to 11, wherein b is 2.
14. The compound of any one of Claims 9 to 13, wherein c is 20.
15. The compound of any one of Claims 1-14, wherein X_{10} is Y.
16. The compound of any one of Claims 1-14, wherein X_{10} is 4Pal.
17. The compound of any one of Claims 1-16, wherein X_{13} is L.
18. The compound of any one of Claims 1-16, wherein X_{13} is α MeL.

19. The compound of any one of Claims 1-18, wherein X₂₀ is 4Pal.
20. The compound of any one of Claims 1-18, wherein X₂₀ is Iva.
21. The compound of any one of Claims 1-18, wherein X₂₀ is α MeL.
22. The compound of any one of Claims 1-21, wherein X₂₁ is A.
23. The compound of any one of Claims 1-21, wherein X₂₁ is Aib.
24. The compound of any one of Claims 1-23, wherein X₂₄ is E.
25. The compound of any one of Claims 1-23, wherein X₂₄ is e.
26. The compound of any one of Claims 1-25, wherein X₂₅ is Y.
27. The compound of any one of Claims 1-25, wherein X₂₅ is α MeY.
28. The compound of any one of Claims 1-27, wherein X₃₉ is E.
29. The compound of any one of Claims 1-27, wherein X₃₉ is S.
30. A compound having a formula selected from the group consisting of SEQ ID NOS:6-11, or a pharmaceutically acceptable salt thereof.
31. A method of treating a disease selected from the group consisting of type 2 diabetes mellitus, dyslipidemia, metabolic syndrome, non-alcoholic fatty liver disease, non-alcoholic steatohepatitis and obesity, the method comprising the step of:
administering to an individual in need thereof an effective amount of a compound of any one of Claims 1 to 30.

32. A method of treating type 2 diabetes mellitus, the method comprising the step of:
administering to an individual in need thereof an effective amount of compound of
any one of Claims 1 to 30.
33. A pharmaceutical composition comprising:
compound of any one of Claims 1 to 30; and
a pharmaceutically acceptable carrier, diluent, or excipient.
34. A compound of any one of Claims 1 to 30 for use in treating a disease selected from
the group consisting of type 2 diabetes mellitus, dyslipidemia, metabolic syndrome, non-
alcoholic fatty liver disease, non-alcoholic steatohepatitis and obesity.
35. The compound of Claim 34, wherein the disease is type 2 diabetes mellitus or
obesity.
36. Use of a compound of any one of Claims 1 to 30 in the manufacture of a medicament
for treating a disease selected from the group consisting of type 2 diabetes mellitus,
dyslipidemia, metabolic syndrome, non-alcoholic fatty liver disease, non-alcoholic
steatohepatitis and obesity.
37. Use of the compound of Claim 36, wherein the disease is type 2 diabetes mellitus
or obesity.
38. A compound comprising SEQ ID NO:6, or a pharmaceutically acceptable salt
thereof.
39. A compound comprising SEQ ID NO:7, or a pharmaceutically acceptable salt
thereof.
40. A compound comprising SEQ ID NO:8, or a pharmaceutically acceptable salt
thereof.

41. A compound comprising SEQ ID NO:9, or a pharmaceutically acceptable salt thereof.
42. A compound comprising SEQ ID NO:10, or a pharmaceutically acceptable salt thereof.
43. A compound comprising SEQ ID NO:11, or a pharmaceutically acceptable salt thereof.