【CLAIMS】

【Claim 1】

A long-acting oxyntomodulin conjugate in which an oxyntomodulin derivative and an immunoglobulin Fc region are linked via a non-peptidyl polymer, wherein the oxyntomodulin derivative comprises the amino acid sequence of following Formula 1:

R1-X1-X2-GTFTSD-X3-X4-X5-X6-X7-X8-X9-X10-X11-X12-X13-X14-X15-X16-X17-X18-X19-X20-X21-X22-X23-X24-R2 (Formula 1)

wherein, R1 is histidine;

X1 is Aib(aminoisobutyric acid);

X2 is glutamic acid or glutamine;

X3 is leucine or tyrosine;

X4 is serine or alanine;

X5 is lysine or arginine;

X6 is glutamine or tyrosine;

X7 is leucine or methionine;

X8 is aspartic acid or glutamic acid;

X9 is glutamic acid, serine, alpha-methyl-glutamic acid or is deleted;

X10 is glutamine, glutamic acid, lysine, arginine, serine or is deleted;

X11 is alanine, arginine, valine or is deleted;

X12 is alanine, arginine, serine, valine or is deleted;

X13 is lysine, glutamine, arginine, alpha-methyl-glutamic acid or is deleted;

X14 is aspartic acid, glutamic acid, leucine or is deleted;

X15 is phenylalanine or is deleted;

X16 is isoleucine, valine or is deleted;

X17 is alanine, cysteine, glutamic acid, lysine, glutamine, alpha-methyl-glutamic acid or is deleted

X18 is tryptophan or is deleted;

X19 is alanine, isoleucine, leucine, serine, valine or is deleted;

X20 is alanine, methionine, glutamine, arginine or is deleted;

X21 is asparagine or is deleted;

X22 is alanine, glycine, threonine or is deleted;

X23 is cysteine, lysine or is deleted;

X24 is a peptide having 2 to 10 amino acids consisting of combinations of alanine, glycine and serine, or is deleted; and
R2 is KRNRNNIA (SEQ ID NO. 32), HSQGTFTSDYSKYLD (SEQ ID NO. 35), HSQGTFTSDYSRYLDK (SEQ ID NO. 36), HGEGTFTSDLSKQMEEEAVK (SEQ ID NO. 37) or is deleted.

【Claim 2】
The long-acting oxyntomodulin conjugate according to claim 1, wherein X19 is leucine, X20 is methionine, X21 is asparagine, and X22 is threonine in the amino acid sequence of Formula 1.

【Claim 3】
The long-acting oxyntomodulin conjugate according to claim 1, wherein X2 is glutamine in the amino acid sequence of Formula 1.

【Claim 4】
The long-acting oxyntomodulin conjugate according to claim 1, wherein X24 and R2 are deleted in the amino acid sequence of Formula 1.

【Claim 5】
The long-acting oxyntomodulin conjugate according to claim 1, wherein the oxyntomodulin derivative comprises the amino acid sequence selected from the group consisting of SEQ ID NOs. 23 to 28 and 33.

【Claim 6】
The long-acting oxyntomodulin conjugate according to claim 1, wherein the non-peptidyl polymer is selected from the group consisting of polyethylene glycol, polypropylene glycol, copolymers of ethylene glycol and propylene glycol, polyoxyethylated polyols, polyvinyl alcohol, polysaccharides, dextran, polyvinyl ethyl ether, polylactic acid (PLA), polylactic-glycolic acid (PLGA), lipid polymers, chitins, hyaluronic acid, polysaccharide and combinations thereof.

【Claim 7】

The long-acting oxyntomodulin conjugate according to claim 1, wherein an amine group or a thiol group of the immunoglobulin Fc region and the oxyntomodulin derivative are linked at both ends of the non-peptidyl polymer, respectively.

【Claim 8】

The long-acting oxyntomodulin conjugate according to claim 1, wherein the non-peptidyl polymer has reactive groups capable of binding with the immunoglobulin Fc region and a protein drug at both ends.

【Claim 9】

The long-acting oxyntomodulin conjugate according to claim 8, wherein the reactive group is selected from the group consisting of an aldehyde group, a propionaldehyde group, a butyraldehyde group, a maleimide group and a succinimide derivative.

【Claim 10】

The long-acting oxyntomodulin conjugate according to claim 8, wherein the reactive groups at both ends are the same as or different from each other.

【Claim 11】

The long-acting oxyntomodulin conjugate according to claim 1, wherein the non-peptidyl polymer is linked to a cysteine residue of the oxyntomodulin derivative.

【Claim 12】

The long-acting oxyntomodulin conjugate according to claim 1, wherein the immunoglobulin Fc region is a non-glycosylated Fc region.

【Claim 13】

The long-acting oxyntomodulin conjugate according to claim 1, wherein

the immunoglobulin Fc region is selected from the group consisting of a CH1 domain, a CH2 domain, a CH3 domain and a CH4 domain; a CH1 domain and a CH2 domain; a CH1 domain and a CH3 domain; a CH2 domain and a CH3 domain; a combination of one or more domains and an immunoglobulin hinge region or a portion thereof; and a dimer of each domain of the heavy-chain constant regions and the light-chain constant region.

【Claim 14】

The long-acting oxyntomodulin conjugate according to claim 1, wherein the immunoglobulin Fc region is a derivative in which a region capable of forming a disulfide bond is deleted, certain amino acid residues are eliminated at the N-terminal end of a native Fc form, a methionine residue is added at the N-terminal end of a native Fc form, a complement-binding site is deleted, or an antibody dependent cell mediated cytotoxicity (ADCC) site is deleted.

【Claim 15】

The long-acting oxyntomodulin conjugate according to claim 1, wherein the immunoglobulin Fc region is an Fc region derived from an immunoglobulin selected from the group consisting of IgG, IgA, IgD, IgE, and IgM.

【Claim 16】

The long-acting oxyntomodulin conjugate according to claim 15, wherein the immunoglobulin Fc region is an IgG4 Fc region.

【Claim 17】

The long-acting oxyntomodulin conjugate according to claim 1, wherein the immunoglobulin Fc region is a human IgG4-derived non-glycosylated Fc region.

【Claim 18】

A pharmaceutical composition for the prevention or treatment of obesity, comprising the long-acting oxyntomodulin conjugate of any one of claims 1 to 17.

【Claim 19】

The pharmaceutical composition according to claim 18, further comprising a pharmaceutically acceptable carrier.

【Claim 20】

The pharmaceutical composition according to claim 18, wherein the composition is administered alone or in combination with other pharmaceutical formulations showing prophylactic or therapeutic effects on obesity.

【Claim 21】

The pharmaceutical composition according to claim 20, wherein the pharmaceutical formulation is selected from the group consisting of a GLP-1 receptor agonist, a leptin receptor agonist, a DPP-IV inhibitor, a Y5 receptor antagonist, a Melanin-concentrating hormone (MCH) receptor antagonist, a Y2/3 receptor agonist, a MC3/4 receptor agonist, a gastric/pancreatic lipase inhibitor, a 5HT2c agonist, a β3A receptor agonist, an Amylin receptor agonist, a Ghrelin antagonist, and a Ghrelin receptor antagonist.