[CLAIMS]

[Claim 1]

A liquid formulation for stabilizing a long-acting GLP-1/glucagon receptor dual agonist peptide conjugate of Chemical Formula 1, the liquid formulation comprising:

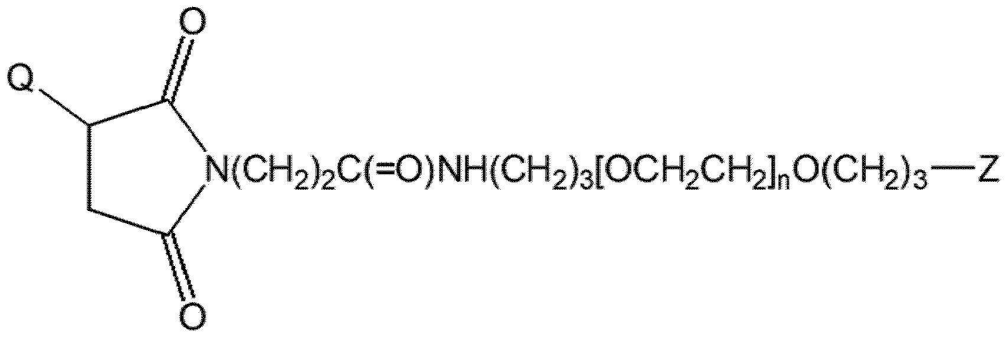
18 nmol/mL to 940 nmol/mL of the long-acting GLP-1/glucagon receptor dual agonist peptide conjugate of Chemical Formula 1,

5 mM to 25 mM of acetic acid and a salt thereof in an amount for maintaining the pH of the liquid formulation in the range of 4.8 to 5.5,

4% w/v to 10% w/v of sucrose, and

0.01% w/v to 0.1% w/v of a nonionic surfactant selected from poloxamer, polysorbate, or a combination thereof;

Wherein Chemical Formula 1 has the structure



wherein Q is a peptide comprising the amino acid sequence set forth in SEQ ID NOS: 2, 3, or 4;

Z is an immunoglobulin Fc fragment; and

n is a natural number, wherein the value of n is determined such that the average molecular weight of the $[OCH_2CH_2]_n$ region in the peptide conjugate is 10 kDa; and wherein the liquid formulation does not contain a sugar alcohol.

[Claim 2]

The liquid formulation of claim 1, wherein Q is represented by an amino acid sequence of SEQ ID NO: 3.

[Claim 3]

The liquid formulation of claim 1, wherein Q is amidated at the C-terminus thereof.

[Claim 4]

The liquid formulation of claim 1, wherein Q is linked via a sulfur atom of cysteine.

[Claim 5]

The liquid formulation of claim 1, wherein the immunoglobulin Fc fragment is derived from IgG4.

[Claim 6]

The liquid formulation of claim 1, wherein Z is a structure in which two polypeptide chains are linked by a disulfide bond, and are linked only through a nitrogen atom in one of the two chains.

[Claim 7]

The liquid formulation of any one of claims 1 to 6, wherein Z is a homodimer comprising two monomers, each monomer comprising the amino acid sequence of SEQ ID NO: 5.

[Claim 8]

The liquid formulation of claim 7, wherein Z is linked via a nitrogen atom of proline at the N-terminus thereof of one of the two monomers.

[Claim 9]

The liquid formulation of claim 1, wherein the immunoglobulin Fc fragment and

Q are non-glycosylated.

[Claim 10]

The liquid formulation of claim 1, wherein the pH of the liquid formulation is 4.9 to 5.3.

[Claim 11]

The liquid formulation of claim 10, wherein the pH of the liquid formulation is 5.0 to 5.2.

[Claim 12]

The liquid formulation of claim 18, wherein the nonionic surfactant is selected from the group consisting of poloxamer 188, polysorbate 20, polysorbate 40, polysorbate 60, polysorbate 80, and a combination thereof.

[Claim 13]

The liquid formulation of claim 1, the liquid formulation further comprises a stabilizer selected from the group consisting of arginine, glycine, methionine, and a combination thereof.

[Claim 14]

The liquid formulation of claim 8, wherein the liquid formulation comprises:

274 nmol/mL to 474 nmol/mL of a long-acting GLP-1/glucagon receptor dual agonist peptide conjugate of Chemical Formula 1 below, in which Q having an amidated C-terminus is linked via a sulfur atom of cysteine;

5 mM to 25 mM of acetic acid and a salt thereof in an amount for maintaining the pH of the liquid formulation in the range of 4.9 to 5.3,

8.5% w/v of sucrose, and

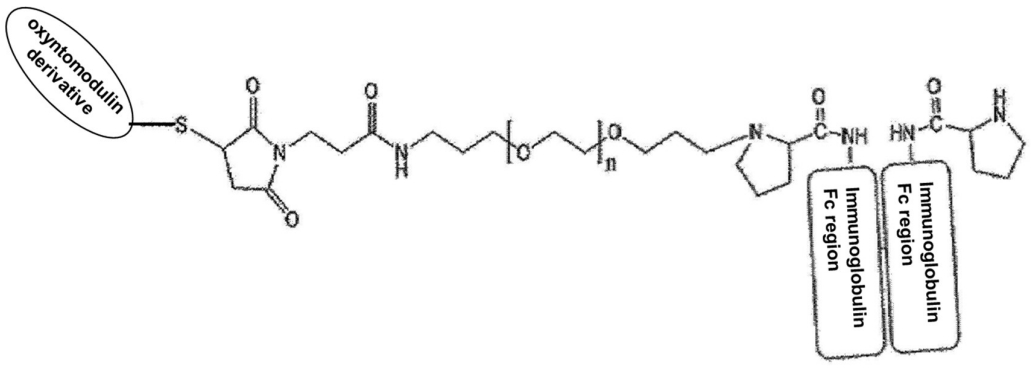
0.02% w/v of polysorbate 20.

[Claim 15]

The liquid formulation of claim 14, wherein the liquid formulation has a transparent appearance when stored for one week under harsh test conditions of 40°C ± 2°C and relative humidity of 75% ± 5%.

[Claim 16]

The liquid formulation of claim 1, wherein the long-acting GLP-1/glucagon receptor dual agonist protein conjugate comprises the formula below,



wherein the oxyntomodulin derivative is represented by the amino acid sequence set forth in SEQ ID NO: 2, 3, or 4 and n is a natural number, wherein the value of n is determined such that the average molecular weight of the $[OCH_2CH_2]_n$ region in the peptide conjugate is 10 kDa.

[Claim 17]

The liquid formulation of claim 16, wherein the Immunoglobulin Fc region is derived from IgG4.