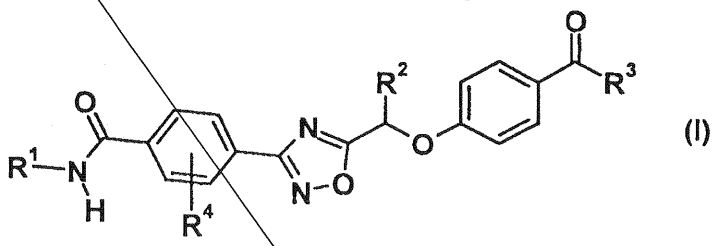
CLAIMS

1. A compound represented by general formula (I):

[Chemical Formula 1]



(I)

wherein R^1 represents a hydroxy C1-C6 alkyl group or a hydroxy C3-C6 cycloalkyl group, each of which may be substituted with 1 to 3 substituents selected from substituent subgroup α,

substituent subgroup α is a group consisting of a hydroxyl group and a carbamoyl group,

R^2 represents a methyl group or an ethyl group,

R^3 represents a C1-C6 alkyl group or a C3-C6 cycloalkyl group, each of which may be substituted with 1 to 3 halogen atoms, and

R^4 represents a halogen atom;

or a pharmaceutically acceptable salt thereof.

2. The compound according to claim 1, wherein R^1 represents a hydroxy C1-C3 alkyl group or a hydroxy C3-C4 cycloalkyl group, each of which may be substituted with 1 to 3 substituents selected from substituent subgroup α.

3. The compound according to claim 1, wherein R^1 represents a hydroxyethyl group, a hydroxypropyl group, a hydroxyisopropyl group, or a hydroxycyclopentyl group, each of which may be

substituted with one substituent selected from substituent subgroup α.

4. The compound according to any one of claims 1 to 3, wherein R^3 represents a C1-C4 alkyl group or a C3-C4 cycloalkyl group, each of which may be substituted with 1 to 3 halogen atoms.

5. The compound according to any one of claims 1 to 3, wherein R^3 represents an isopropyl group, a tert-butyl group, a cyclopropyl group, or a cyclobutyl group, each of which may be substituted with one halogen atom.

6. The compound according to any one of claims 1 to 5, wherein R^4 represents a fluorine atom.

7. A compound selected from the group consisting of the following compounds:

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-N-[(2S)-2,3-dihydroxypropyl]-2-fluorobenzamide;

N-[(1S)-2-amino-1-(hydroxymethyl)-2-oxoethyl]-4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluorobenzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R)-2-hydroxy-1-methylethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-

1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S)-2-hydroxy-1-methylethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-N-[(2R)-2,3-dihydroxypropyl]-2-fluorobenzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S)-2-hydroxy-1-methylethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R,2R)-2-hydroxycyclopentyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R)-2-hydroxy-1-methylethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S,2S)-2-hydroxycyclopentyl]benzamide;

4-(5-{(1R)-1-[4-(2,2-dimethylpropanoyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclobutylcarbonyl)phenoxy]propyl}-1

,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

2-fluoro-4-{5-[(1R)-1-{4-[(1-fluorocyclopropyl)carbonyl]phenoxy}propyl]-1,2,4-oxadiazol-3-yl}-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

2-fluoro-N-[(1R)-2-hydroxy-1-methylethyl]-4-{5-[(1R)-1-(4-isobutyrylphenoxy)propyl]-1,2,4-oxadiazol-3-yl}benzamide; and

2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]-4-{5-[(1R)-1-(isobutyrylphenoxy)propyl]-1,2,4-oxadiazol-3-yl}benzamide.

8.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-N-[(2S)-2,3-dihydroxypropyl]-2-fluorobenzamide, or a pharmaceutically acceptable salt thereof.

9.

N-[(1S)-2-Amino-1-(hydroxymethyl)-2-oxoethyl]-4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluorobenzamide, or a pharmaceutically acceptable salt thereof.

10.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R)-2-hydroxy-1-methylethyl]benzamide, or a pharmaceutically acceptable salt thereof.

11.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S)-2-hydroxy-1-methylethyl]benzamide, or a pharmaceutically acceptable salt thereof.

12.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-N-[(2R)-2,3-dihydroxypropyl]-2-fluorobenzamide, or a pharmaceutically acceptable salt thereof.

13.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide, or a pharmaceutically acceptable salt thereof.

14.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide, or a pharmaceutically acceptable salt thereof.

15.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S)-2-hydroxy-1-methylethyl]benzamide, or a pharmaceutically acceptable salt thereof.

16.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R,2R)-2-hydroxycyclopentyl]benzamide, or a pharmaceutically acceptable salt thereof.

17.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R)-2-hydroxy-1-methylethyl]benzamide, or a pharmaceutically acceptable salt thereof.

18.

4-(5-{(1R)-1-[4-(Cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S,2S)-2-hydroxycyclopentyl]benzamide, or a pharmaceutically acceptable salt thereof.

19.

4-(5-{(1R)-1-[4-(2,2-Dimethylpropanoyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide, or a pharmaceutically acceptable salt thereof.

20.

4-(5-{(1R)-1-[4-(Cyclobutylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide, or a pharmaceutically acceptable salt thereof.

21.

2-Fluoro-4-{5-[(1R)-1-{4-[(1-fluorocyclopropyl)carbonyl]phenoxy}propyl]-1,2,4-oxadiazol-3-yl}-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide or a pharmaceutically acceptable salt thereof.

22.

2-Fluoro-N-[(1R)-2-hydroxy-1-methylethyl]-4-{5-[(1R)-1-(4-isobutyrylphenoxy)propyl]-1,2,4-oxadiazol-3-yl}benzamide, or a pharmaceutically acceptable salt thereof.

23.

2-Fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]-4-{5-[(1R)-1-(isobutyrylphenoxy)propyl]-1,2,4-oxadiazol-3-yl}benzamide, or a pharmaceutically acceptable salt thereof.

24. A pharmaceutical composition comprising, as an active ingredient, the compound according to any one of claims 1 to 23, or a pharmaceutically acceptable salt thereof.

25. The pharmaceutical composition according to claim 24, for treating type 1 diabetes, type 2 diabetes, or obesity.

26. The pharmaceutical composition according to claim 24, for protecting β cells or the pancreas.

27. Use of the compound according to any one of claims 1 to 23 or a pharmaceutically acceptable salt thereof, for preparing a pharmaceutical composition.

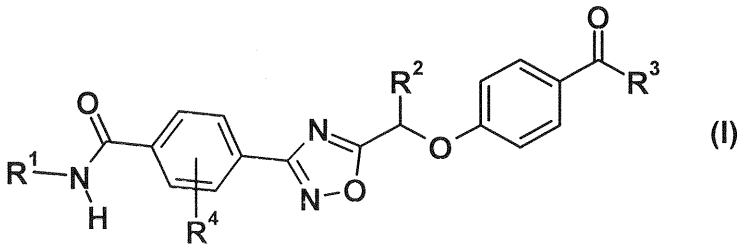
28. A method for treating a disease, the method comprising administering to a mammal the compound according to any one of claims 1 to 23 or a pharmaceutically acceptable salt thereof.

29. The method according to claim 28, wherein the mammal is a human being.

CLAIMS

1. A compound represented by general formula (I):

[Chemical Formula 1]



(I)

wherein R^1 represents a hydroxy C1-C6 alkyl group or a hydroxy C3-C6 cycloalkyl group, each of which may be substituted with 1 to 3 substituents selected from substituent subgroup α,

substituent subgroup α is a group consisting of a hydroxyl group and a carbamoyl group,

R^2 represents a methyl group or an ethyl group,

R^3 represents a C1-C6 alkyl group or a C3-C6 cycloalkyl group, each of which may be substituted with 1 to 3 halogen atoms, and

R^4 represents a halogen atom;

or a pharmaceutically acceptable salt thereof.

2. The compound according to claim 1, wherein R^1 represents a hydroxy C1-C3 alkyl group or a hydroxy C3-C4 cycloalkyl group, each of which may be substituted with 1 to 3 substituents selected from substituent subgroup α.

3. The compound according to claim 1, wherein R^1 represents a hydroxyethyl group, a hydroxypropyl group, a hydroxyisopropyl group, or a hydroxycyclopentyl group, each of which may be

substituted with one substituent selected from substituent subgroup α.

4. The compound according to any one of claims 1 to 3, wherein R^3 represents a C1-C4 alkyl group or a C3-C4 cycloalkyl group, each of which may be substituted with 1 to 3 halogen atoms.

5. The compound according to any one of claims 1 to 3, wherein R^3 represents an isopropyl group, a tert-butyl group, a cyclopropyl group, or a cyclobutyl group, each of which may be substituted with one halogen atom.

6. The compound according to any one of claims 1 to 5, wherein R^4 represents a fluorine atom.

7. The compound according to Claim 1, which is selected from the group consisting of the following compounds:

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-N-[(2S)-2,3-dihydroxypropyl]-2-fluorobenzamide;

N-[(1S)-2-amino-1-(hydroxymethyl)-2-oxoethyl]-4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluorobenzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R)-2-hydroxy-1-methylethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-

1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S)-2-hydroxy-1-methylethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-N-[(2R)-2,3-dihydroxypropyl]-2-fluorobenzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S)-2-hydroxy-1-methylethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R,2R)-2-hydroxycyclopentyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1R)-2-hydroxy-1-methylethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclopropylcarbonyl)phenoxy]ethyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[(1S,2S)-2-hydroxycyclopentyl]benzamide;

4-(5-{(1R)-1-[4-(2,2-dimethylpropanoyl)phenoxy]propyl}-1,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

4-(5-{(1R)-1-[4-(cyclobutylcarbonyl)phenoxy]propyl}-1

,2,4-oxadiazol-3-yl)-2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

2-fluoro-4-{5-[(1R)-1-{4-[(1-fluorocyclopropyl)carbonyl]phenoxy}propyl]-1,2,4-oxadiazol-3-yl}-N-[2-hydroxy-1-(hydroxymethyl)ethyl]benzamide;

2-fluoro-N-[(1R)-2-hydroxy-1-methylethyl]-4-{5-[(1R)-1-(4-isobutyrylphenoxy)propyl]-1,2,4-oxadiazol-3-yl}benzamide; and

2-fluoro-N-[2-hydroxy-1-(hydroxymethyl)ethyl]-4-{5-[(1R)-1-(isobutyrylphenoxy)propyl]-1,2,4-oxadiazol-3-yl}benzamide.

8. A pharmaceutical composition comprising, as an active ingredient, the compound according to any one of claims 1 to 7, or a pharmaceutically acceptable salt thereof.

9. The pharmaceutical composition according to claim 8, for use in treating type 1 diabetes, type 2 diabetes, or obesity.

10. The pharmaceutical composition according to claim 8, for use in protecting β cells or the pancreas.

11. Use of the compound according to any one of claims 1 to 7 or a pharmaceutically acceptable salt thereof, for preparing a pharmaceutical composition.

12. Use according to claim 11, wherein the pharmaceutical

composition is for treating type 1 diabetes, type 2 diabetes, or obesity.

13. Use according to claim 11, wherein the pharmaceutical composition is for protecting β cells or the pancreas.

14. A compound according to any one of claims 1 to 7 for use in the treatment of type 1 diabetes, type 2 diabetes, or obesity.

15. A compound according to any one of claims 1 to 7 for use in protecting β cells or the pancreas.