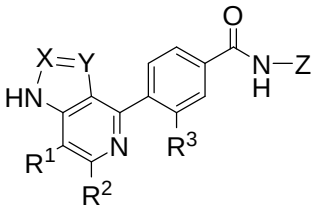
CLAIMS

1. A compound represented by Formula (I):



(I)

[wherein

-X= represents -CH= or -N=;

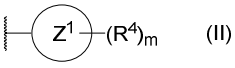
=Y- represents =CH- or =N-;

R^1 and R^2 each independently represent a hydrogen atom, a halogen atom, a cyano group, a hydroxy group, a sulfanyl group, an amino group, a carbamoyl group, a sulfamoyl group, a carboxy group, a C_{1-6} alkyl group, a C_{2-6} alkenyl group, a halo C_{1-6} alkyl group, a hydroxy C_{1-6} alkyl group, a hydroxyhalo C_{1-6} alkyl group, a C_{1-6} alkoxy group, a halo C_{1-6} alkoxy group, a hydroxy C_{1-6} alkoxy group, a (C_{1-6} alkoxy) C_{1-6} alkyl group, a (halo C_{1-6} alkoxy) C_{1-6} alkyl group, a C_{1-6} alkylthio group, a mono C_{1-6} alkylamino group, a di C_{1-6} alkylamino group, a mono (halo C_{1-6} alkyl) amino group, or a C_{3-6} cycloalkyl group;

R^3 represents a hydrogen atom or a halogen atom; and

Z is a group represented by

Formula (II):



(II)

(wherein

the wavy line represents the point of attachment to the nitrogen atom;

ring Z^1 represents a C_{6-10} aryl group, a C_{3-10} cycloalkyl group, a 5- to 10-membered heteroaryl group, or a 4- to 10-membered heterocyclyl group;

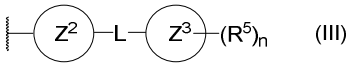
m represents 0, 1, or 2; and

R^4 represents (when there are multiple R^4's, each R^4 independently represents) a halogen atom, a cyano group, a hydroxy group, a sulfanyl group, an amino group, a carbamoyl group, a sulfamoyl group, a carboxy group, a formyl group, an azide group, a hydrazinyl group, a nitro group, a C_{1-6} alkyl group, a C_{2-6} alkenyl group, a halo C_{1-6} alkyl group, a hydroxy C_{1-6} alkyl group, a hydroxyhalo C_{1-6} alkyl group, a C_{1-6} alkoxy group, a halo C_{1-6} alkoxy group, a hydroxy C_{1-6} alkoxy group, a (C_{1-6} alkoxy) C_{1-6} alkyl group, a (halo C_{1-6} alkoxy) C_{1-6} alkyl group, a C_{1-6} alkylthio group, a mono C_{1-6} alkylamino group, a di C_{1-6} alkylamino group, a mono (halo C_{1-6} alkyl) amino group, a C_{2-7} alkanoyl group, a halo C_{2-7} alkanoyl group, a hydroxy C_{2-7} alkanoyl group, a C_{2-7} alkoxycarbonyl group, a mono C_{1-6} alkylcarbamoyl group, a di C_{1-6} alkylcarbamoyl group, a C_{1-6} alkylsulfonyl group, a C_{1-6} alkylsulfonyloxy group, a halo C_{1-6} alkylsulfonyloxy group, a mono C_{1-6} alkylsulfamoyl group, a di C_{1-6} alkylsulfamoyl group, a mono C_{2-7} alkanoylamino group, a (C_{2-7} alkanoyl) C_{1-6} alkylamino group, a di C_{2-7} alkanoylamino

group, a mono C_{1-6} alkylsulfonylamino group, a mono C_{2-7} alkoxycarbonylamino group, or an oxo group.)

or

Formula (III):



(III)

(wherein

the wavy line represents the point of attachment to the nitrogen atom;

ring Z^2 represents a C_{6-10} aryl group, a C_{3-10} cycloalkyl group, a 5- to 10-membered heteroaryl group, or a 4- to 10-membered heterocyclyl group;

L represents a single bond, a C_{1-6} alkanediyl group, a hydroxy C_{1-6} alkanediyl group, a carbonyl group, or a sulfonyl group;

ring Z^3 represents a C_{6-10} aryl group, a C_{3-10} cycloalkyl group, a 5- to 10-membered heteroaryl group, or a 4- to 10-membered heterocyclyl group;

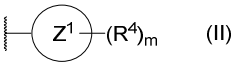
n represents 0, 1, or 2; and

R^5 represents (when there are multiple R^5's, each R^5 independently represents)

a halogen atom, a cyano group, a hydroxy group, a sulfanyl group, an amino group, a carbamoyl group, a sulfamoyl group, a carboxy group, a formyl group, an azide group, a hydrazinyl group, a nitro group, a C_{1-6} alkyl group, a C_{2-6} alkenyl group, a halo C_{1-6} alkyl group, a

hydroxy C_{1-6} alkyl group, a hydroxyhalo C_{1-6} alkyl group, a C_{1-6} alkoxy group, a halo C_{1-6} alkoxy group, a hydroxy C_{1-6} alkoxy group, a (C_{1-6} alkoxy) C_{1-6} alkyl group, a (halo C_{1-6} alkoxy) C_{1-6} alkyl group, a C_{1-6} alkylthio group, a mono C_{1-6} alkylamino group, a di C_{1-6} alkylamino group, a mono (halo C_{1-6} alkyl) amino group, a C_{2-7} alkanoyl group, a halo C_{2-7} alkanoyl group, a hydroxy C_{2-7} alkanoyl group, a C_{2-7} alkoxycarbonyl group, a mono C_{1-6} alkylcarbamoyl group, a di C_{1-6} alkylcarbamoyl group, a C_{1-6} alkylsulfonyl group, a C_{1-6} alkylsulfonyloxy group, a halo C_{1-6} alkylsulfonyloxy group, a mono C_{1-6} alkylsulfamoyl group, a di C_{1-6} alkylsulfamoyl group, a mono C_{2-7} alkanoylamino group, a (C_{2-7} alkanoyl) C_{1-6} alkylamino group, a di C_{2-7} alkanoylamino group, a mono C_{1-6} alkylsulfonylamino group, a mono C_{2-7} alkoxycarbonylamino group, an oxo group, a C_{3-6} cycloalkyl group, a cyclic ether group, a cyclic amino group, or a halo cyclic amino group.)] or a pharmaceutically acceptable salt thereof.

2. The compound according to claim 1 or a pharmaceutically acceptable salt thereof, wherein Z is a group represented by Formula (II):



(II)

(wherein

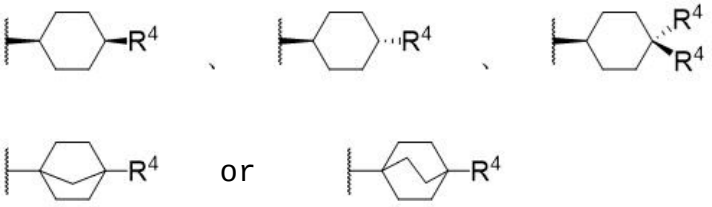
the wavy line represents the point of attachment to the nitrogen atom; and

ring Z^1, m, and R^4 are as defined above.).

3. The compound according to claim 1 or 2 or a pharmaceutically acceptable salt thereof, wherein ring Z^1 is a C_{3-10} cycloalkyl group.

4. The compound according to any one of claims 1 to 3 or a pharmaceutically acceptable salt thereof, wherein ring Z^1 is a

group represented by Formula:



(wherein

the wavy line represents the point of attachment to the nitrogen atom; and

R^4 is as defined above.).

5. The compound according to any one of claims 1 to 4 or a pharmaceutically acceptable salt thereof, wherein R^1 is a hydrogen atom, a halogen atom, a cyano group, a C_{1-6} alkyl group, or a halo C_{1-6} alkyl group, and R^2 is a hydrogen atom.

6. The compound according to any one of claims 1 to 5 or a pharmaceutically acceptable salt thereof, wherein R^4 represents (when there are multiple R^4's, each R^4 independently represents) a cyano group, a hydroxy group, a carbamoyl group, a C_{1-6} alkyl group, a hydroxy C_{1-6} alkyl group, or a hydroxy C_{1-6} alkoxy group.

7. The compound according to any one of claims 1 to 6 or a pharmaceutically acceptable salt thereof, wherein -X= is -CH=, and =Y- is =CH-.

8. The compound according to any one of claims 1 to 6 or a pharmaceutically acceptable salt thereof, wherein -X= is -N=, and =Y- is =CH-.

9. The compound according to claim 1 or a pharmaceutically acceptable salt thereof, which is selected from (1) to (49) below:

(1) N-(4-hydroxybicyclo[2.2.2]octan-1-yl)-4-(7-methyl-1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(2) N-(trans-4-hydroxy-4-methylcyclohexyl)-4-(7-methyl-1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(3) N-[trans-4-(1-hydroxycyclopropyl)cyclohexyl]-4-(7-methyl-1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(4) N-[trans-4-(2-hydroxy-2-

methylpropoxy)cyclohexyl]-4-(7-methyl-1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(5) 3-fluoro-N-(trans-4-hydroxy-4-methylcyclohexyl)-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(6) 3-fluoro-N-(4-hydroxybicyclo[2.2.2]octan-1-yl)-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(7) N-(4-cyanobicyclo[2.2.2]octan-1-yl)-3-fluoro-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(8) 4-[3-fluoro-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide]bicyclo[2.2.2]octane-1-carboxamide;

(9) 3-fluoro-N-[trans-4-(2-hydroxy-2-methylpropoxy)cyclohexyl]-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(10) 3-fluoro-N-(4-hydroxybicyclo[2.2.1]heptan-1-yl)-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(11) 3-fluoro-N-[trans-4-(1-hydroxycyclopropyl)cyclohexyl]-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(12) 3-fluoro-N-(trans-4-hydroxycyclohexyl)-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(13) 4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(14) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(15) 4-(7-cyano-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-

[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(16) 4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.2]octan-1-yl)benzamide;

(17) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.2]octan-1-yl)benzamide;

(18) 4-[7-(difluoromethyl)-1H-pyrrolo[3,2-c]pyridin-4-yl]-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(19) 4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.1]heptan-1-yl)benzamide;

(20) 4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(trans-4-hydroxycyclohexyl)benzamide;

(21) 4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(trans-4-hydroxy-4-methylcyclohexyl)benzamide;

(22) 4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-[trans-4-(2-hydroxy-2-methylpropoxy)cyclohexyl]benzamide;

(23) 4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(cis-4-hydroxycyclohexyl)benzamide;

(24) 4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(tetrahydropyran-4-yl)benzamide;

(25) N-(1,1-dioxotetrahydrothiopyran-4-yl)-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(26) N-(trans-4-cyanocyclohexyl)-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(27) N-(trans-4-carbamoylcyclohexyl)-4-(7-fluoro-1H-

pyrrolo[3,2-c]pyridin-4-yl)benzamide;

(28) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(tetrahydropyran-4-yl)benzamide;

(29) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(1,1-dioxotetrahydrothiopyran-4-yl)benzamide;

(30) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(trans-4-hydroxycyclohexyl)benzamide;

(31) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(cis-4-hydroxy-4-methylcyclohexyl)benzamide;

(32) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.1]heptan-1-yl)benzamide;

(33) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(cis-4-hydroxycyclohexyl)benzamide;

(34) 4-(7-chloro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(trans-4-hydroxy-4-methylcyclohexyl)benzamide;

(35) 3-fluoro-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(36) 3-fluoro-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.2]octan-1-yl)benzamide;

(37) 3-fluoro-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(trans-4-hydroxy-4-methylcyclohexyl)benzamide;

(38) 3-fluoro-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(tetrahydropyran-4-yl)benzamide;

(39) 3-fluoro-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-

4-yl)-N-(trans-4-hydroxycyclohexyl)benzamide;

(40) 3-fluoro-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(cis-4-hydroxy-4-methylcyclohexyl)benzamide;

(41) 3-fluoro-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.1]heptan-1-yl)benzamide;

(42) 3-fluoro-4-(7-fluoro-1H-pyrrolo[3,2-c]pyridin-4-yl)-N-(cis-4-hydroxycyclohexyl)benzamide;

(43) N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]-4-(1H-pyrazolo[4,3-c]pyridin-4-yl)benzamide;

(44) N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]-4-(1H-imidazo[4,5-c]pyridin-4-yl)benzamide;

(45) 4-(1H-[1,2,3]triazolo[4,5-c]pyridin-4-yl)-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(46) 4-(7-fluoro-1H-pyrazolo[4,3-c]pyridin-4-yl)-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(47) 4-(7-fluoro-1H-pyrazolo[4,3-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.2]octan-1-yl)benzamide;

(48) 4-(7-chloro-1H-pyrazolo[4,3-c]pyridin-4-yl)-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide; and

(49) 3-fluoro-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]-4-(1H-pyrazolo[4,3-c]pyridin-4-yl)benzamide.

10. A pharmaceutical composition, comprising: the compound according to any one of claims 1 to 9 or a pharmaceutically acceptable salt thereof.

11. Use of the compound according to any one of claims 1 to 9 or a pharmaceutically acceptable salt thereof in the manufacture of a pharmaceutical composition for preventing or treating a disease involving H-PGDS.

12. The pharmaceutical composition according to claim 11, wherein the disease involving H-PGDS is selected from the group consisting of asthma, chronic obstructive pulmonary disease, allergic rhinitis, sinusitis, eosinophilic pneumonia, atherosclerosis, rheumatoid arthritis, cystic fibrosis, actinic keratosis, chronic urticaria, dermatitis, muscular dystrophy, sarcopenia, disuse muscle atrophy, muscle damage, wounds, dermatomyositis, amyotrophic lateral sclerosis, cerebral infarction, myocardial infarction, ischemic bowel disease, ischemic renal disease, ischemic stomach disease, ischemic liver disease, diabetic ischemic limb, and Buerger's disease.

13. An H-PGDS inhibitor, comprising: the compound according to any one of claims 1 to 9 or a pharmaceutically acceptable salt thereof.

14. The compound according to any one of claims 1 to 9 or a pharmaceutically acceptable salt thereof for use as a

medicament.