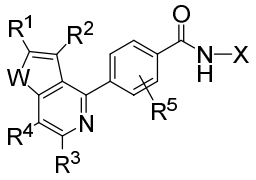
CLAIMS

1. A compound represented by Formula (I):



(I)

[wherein

R^1 represents a hydrogen atom, a halogen atom, or a C_{1-6} alkyl group;

R^2 represents a hydrogen atom, a halogen atom, a cyano group, a hydroxy group, a carbamoyl group, a C_{1-6} alkyl group, a halo C_{1-6} alkyl group, a hydroxy C_{1-6} alkyl group, or a C_{1-6} alkoxy group;

R^3 represents a hydrogen atom, a halogen atom, a cyano group, a hydroxy 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 C_{2-7} alkanoyl group, a C_{1-6} alkylsulfonyl group, a C_{1-6} alkoxy group, a halo C_{1-6} alkoxy group, a C_{1-6} alkylsulfonyloxy group, a halo C_{1-6} alkylsulfonyloxy group, a mono C_{1-6} alkylamino group, a di C_{1-6} alkylamino 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_{1-6} alkylcarbamoyl group, a di C_{1-6} alkylcarbamoyl group, a mono C_{1-6} alkylsulfamoyl group, a di C_{1-6} alkylsulfamoyl group, a

C_{3-6} cycloalkyl group, a cyclic ether group, a cyclic amino group, or a halo cyclic amino group;

R^4 represents a hydrogen atom, a halogen atom, a cyano group, a hydroxy 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 C_{1-6} alkoxy group, a halo C_{1-6} alkoxy group, a mono C_{1-6} alkylamino group, or a di C_{1-6} alkylamino group;

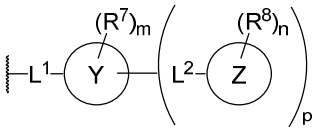
R^5 represents a hydrogen atom, a halogen atom, a cyano group, a hydroxy group, a C_{1-6} alkyl group, a halo C_{1-6} alkyl group, or a hydroxy C_{1-6} alkyl group;

W represents an oxygen atom, a sulfur atom, or a group represented by General Formula: $-N(R^6)-$;

R^6 represents a hydrogen atom or a C_{1-6} alkyl group; and

X represents 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 (C_{1-6} alkoxy) C_{1-6} alkyl group, a (halo C_{1-6} alkoxy) C_{1-6} alkyl group, an amino C_{1-6} alkyl group, a (mono C_{1-6} alkylamino) C_{1-6} alkyl group, a (di C_{1-6} alkylamino) C_{1-6} alkyl group, a carbamoyl C_{1-6} alkyl group, a (mono C_{1-6} alkylcarbamoyl) C_{1-6} alkyl group, a (di C_{1-6} alkylcarbamoyl) C_{1-6} alkyl group, a sulfamoyl C_{1-6} alkyl group, a (mono C_{1-6} alkylsulfamoyl) C_{1-6} alkyl group, a (di C_{1-6} alkylsulfamoyl) C_{1-6} alkyl group, or

a group represented by General Formula (II):



(wherein

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

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

ring Y represents a C_{6-10} aryl group, a heteroaryl group, a C_{3-10} cycloalkyl group, or a 4- to 10-membered heterocyclyl group (wherein the C_{3-10} cycloalkyl group and the 4- to 10-membered heterocyclyl group are optionally condensed with a benzene ring or a heteroaryl ring to form a condensed ring group, or optionally form a bicyclo ring group or a spiro ring group);

each R^7 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 imino group, an azide group, a hydrazino group, a nitro group, an oxetanylamino 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) C_{1-6} alkyl group, a C_{2-7} alkanoyl group, a halo C_{2-7} alkanoyl group, a hydroxy C_{2-7} alkanoyl group, a C_{1-6} alkylsulfonyl 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} 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} alkoxycarbonyl group, a mono C_{1-6} alkylcarbamoyl group, a di C_{1-6} alkylcarbamoyl 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} alkoxycarbonyl)amino group, a C_{3-6} cycloalkyl group, a hydroxy C_{3-6} cycloalkyl group, a (hydroxy C_{3-6} cycloalkyl) C_{1-6} alkoxy group, a C_{3-6} cycloalkylcarbonyl group, a cyclic ether group, a cyclic amino group, a halo cyclic amino group, or an oxo group;

L^2 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 represents a phenyl group, a heteroaryl group, or a 4- to 10-membered heterocyclyl group (the 4- to 10-membered heterocyclyl group is optionally condensed with a benzene ring or a heteroaryl ring to form a condensed ring group, or optionally forms a bicyclo ring group or a spiro ring group);

each R^8 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 morpholinocarbonyl 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 (C_{1-6} alkoxy) C_{1-6} alkyl group, a C_{2-7} alkanoyl group, a C_{1-6} alkylsulfonyl group, a C_{1-6} alkoxy group, a halo C_{1-6} alkoxy group, a mono C_{1-6} alkylamino group, a di C_{1-6} alkylamino 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} 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} alkoxycarbonyl)amino group, a C_{3-6} cycloalkyl group, a cyclic ether group, a cyclic amino group, a halo cyclic amino group, or an oxo group;

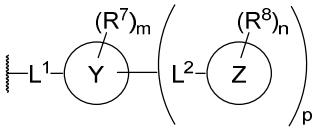
m represents 0, 1, 2, or 3;

n represents 0, 1, or 2; and

p represents 0 or 1.)]

or a pharmaceutically acceptable salt thereof.

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



(wherein

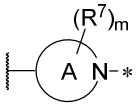
the wavy line represents the point of attachment to the nitrogen atom, and

L^1, ring Y, R^7, L^2, ring Z, R^8, m, n, and p are as defined above.).

3. The compound according to claim 1 or 2 or a pharmaceutically acceptable salt thereof, wherein L^1 is a single bond or a methylene group.

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

5. The compound according to claim 4 or a pharmaceutically acceptable salt thereof, wherein ring Y is a group represented by General Formula (III):



(wherein

the wavy line represents the point of attachment to L^1,

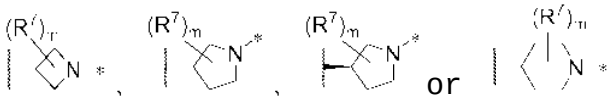
* represents the point of attachment to L^2,

R^7 and m are as defined above, and

ring A is a 4- to 10-membered nitrogen-containing heterocyclyl group.).

6. The compound according to claim 4 or 5 or a pharmaceutically acceptable salt thereof, wherein ring Y is

a group represented by General Formula:



(wherein

the wavy line represents the point of attachment to L^1,

* represents the point of attachment to L^2, and

R^7 and m are as defined above.).

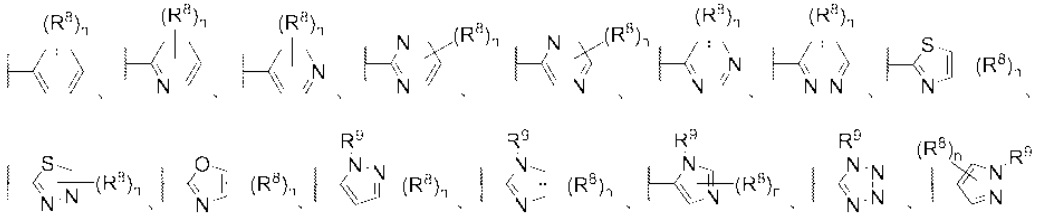
7. The compound according to any one of claims 4 to 6 or a pharmaceutically acceptable salt thereof, wherein m is 0.

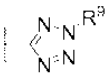
8. The compound according to any one of claims 4 to 7 or a pharmaceutically acceptable salt thereof, wherein L^2 is a single bond.

9. The compound according to any one of claims 4 to 8 or a pharmaceutically acceptable salt thereof, wherein ring Z is a phenyl group or a heteroaryl group.

10. The compound according to any one of claims 4 to 9 or a pharmaceutically acceptable salt thereof, wherein ring Z is a phenyl group or a 5- or 6-membered nitrogen-containing heteroaryl group.

11. The compound according to any one of claims 4 to 10 or a pharmaceutically acceptable salt thereof, wherein ring Z is a group represented by General Formula:



or 

(wherein

the wavy line represents the point of attachment to L^2,

R^8 and n are as defined above, and

R^9 is a C_{1-6} alkyl group, a halo C_{1-6} alkyl group, a hydroxy C_{1-6} alkyl group, a (C_{1-6} alkoxy) C_{1-6} alkyl group, or a C_{3-6} cycloalkyl group.

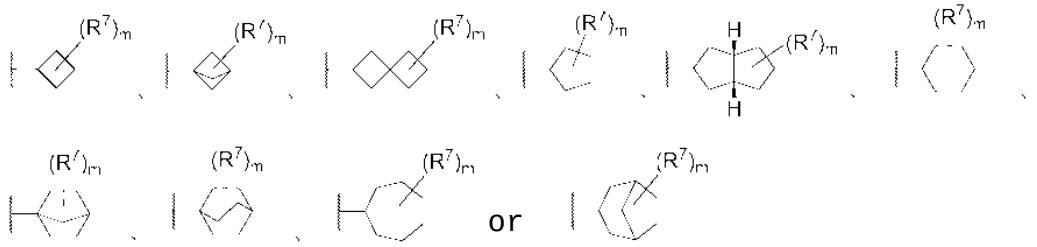
12. The compound according to any one of claims 1 to 3 or a pharmaceutically acceptable salt thereof, wherein p is 0.

13. The compound according to claim 12 or a pharmaceutically acceptable salt thereof, wherein ring Y is a C_{3-10} cycloalkyl group (the C_{3-10} cycloalkyl group is optionally condensed with a benzene ring or a heteroaryl ring to form a condensed ring group, or optionally forms a bicyclo ring group or a spiro ring group), or a 4- to 10-membered heterocyclyl group (the 4- to 10-membered heterocyclyl group is optionally condensed with a benzene ring or a heteroaryl ring to form a condensed ring group,

or optionally forms a bicyclo ring group or a spiro ring group.).

14. The compound according to claim 12 or 13 or a pharmaceutically acceptable salt thereof, wherein ring Y is a C_{3-10} cycloalkyl group (the C_{3-10} cycloalkyl group is optionally condensed with a benzene ring or a heteroaryl ring to form a condensed ring group, or optionally forms a bicyclo ring group or a spiro ring group).

15. The compound according to any one of claims 12 to 14 or a pharmaceutically acceptable salt thereof, wherein ring Y is a group represented by General Formula:

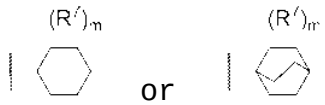


(wherein

the wavy line represents the point of attachment to L^1, and

R^7 and m are as defined above.).

16. The compound according to any one of claims 12 to 15 or a pharmaceutically acceptable salt thereof, wherein ring Y is a group represented by General Formula:



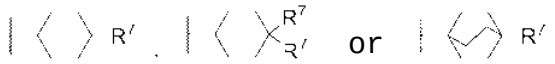
(wherein

the wavy line represents the point of attachment to L^1, and

R^7 and m are as defined above.).

17. The compound according to any one of claims 12 to 16 or a pharmaceutically acceptable salt thereof, wherein

ring Y is a group represented by General Formula:



(wherein

the wavy line represents the point of attachment to L^1, and

R^7 is as defined above.).

18. The compound according to any one of claims 12 to 16 or a pharmaceutically acceptable salt thereof, wherein m is 1 or 2.

19. The compound according to any one of claims 1 to 18 or a pharmaceutically acceptable salt thereof, wherein W is an oxygen atom or a group represented by General Formula: -$N(R^6)$- (wherein R^6 is as defined above.).

20. The compound according to any one of claims 1 to 19 or a pharmaceutically acceptable salt thereof, wherein W is

an oxygen atom.

21. The compound according to any one of claims 1 to 19 or a pharmaceutically acceptable salt thereof, wherein W is a group represented by General Formula: -N(R^6)- (wherein R^6 is as defined above.).

22. The compound according to any one of claims 1 to 19 or a pharmaceutically acceptable salt thereof, wherein W is -NH-.

23. The compound according to any one of claims 1 to 22 or a pharmaceutically acceptable salt thereof, wherein R^5 is a hydrogen atom or a fluorine atom.

24. The compound according to any one of claims 1 to 23 or a pharmaceutically acceptable salt thereof, wherein R^1, R^2, and R^4 are each independently a hydrogen atom, a halogen atom, or a C_{1-6} alkyl group.

25. The compound according to any one of claims 1 to 24 or a pharmaceutically acceptable salt thereof, wherein R^3 is a hydrogen atom, a halogen atom, a C_{1-6} alkyl group, or a hydroxy C_{1-6} alkyl group.

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

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

(2) N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]-4-

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

(3) 4-(furo[3,2-c]pyridin-4-yl)-N-[trans-4-(2-hydroxy-2-methylpropoxy) cyclohexyl]benzamide;

(4) 4-(furo[3,2-c]pyridin-4-yl)-N-[1-(1-methyl-1H-tetrazol-5-yl)piperidin-4-yl]benzamide;

(5) 4-(furo[3,2-c]pyridin-4-yl)-N-{trans-4-[(2,2,2-trifluoroethyl)amino]cyclohexyl}benzamide;

(6) 4-(furo[3,2-c]pyridin-4-yl)-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

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

(8) N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]-4-(6-methylfuro[3,2-c]pyridin-4-yl)benzamide;

(9) N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]-4-(7-methylfuro[3,2-c]pyridin-4-yl)benzamide;

(10) 4-(furo[3,2-c]pyridin-4-yl)-N-[1-(pyrimidin-2-yl)piperidin-4-yl]benzamide;

(11) 4-(furo[3,2-c]pyridin-4-yl)-N-[1-(2,2,2-trifluoroethyl)piperidin-4-yl]benzamide;

(12) (S)-4-(furo[3,2-c]pyridin-4-yl)-N-[1-(pyrimidin-2-yl)pyrrolidin-3-yl]benzamide;

(13) (S)-4-(furo[3,2-c]pyridin-4-yl)-N-{1-[5-(hydroxymethyl)pyrimidin-2-yl]pyrrolidin-3-yl}benzamide;

(14) N-(chroman-3-ylmethyl)-4-(furo[3,2-c]pyridin-4-yl)benzamide;

(15) 4-(furo[3,2-c]pyridin-4-yl)-N-(1-propionylpiperidin-4-yl)benzamide;

(16) N-[1-(cyclopropanecarbonyl)piperidin-4-yl]-4-(furo[3,2-c]pyridin-4-yl)benzamide;

(17) 4-(furo[3,2-c]pyridin-4-yl)-N-[1-(oxetan-3-yl)piperidin-4-yl]benzamide;

(18) N-[1-(1,3,4-thiadiazol-2-yl)piperidin-4-yl]-4-(furo[3,2-c]pyridin-4-yl)benzamide;

(19) 4-(furo[3,2-c]pyridin-4-yl)-N-[1-(2-hydroxy-2-methylpropanoyl)piperidin-4-yl]benzamide;

(20) 4-(furo[3,2-c]pyridin-4-yl)-N-(trans-4-hydroxycyclohexyl)benzamide;

(21) 4-(furo[3,2-c]pyridin-4-yl)-N-[trans-4-(1-hydroxycyclopropyl)cyclohexyl]benzamide;

(22) 4-(furo[3,2-c]pyridin-4-yl)-N-{trans-4-[(1-hydroxycyclopropyl)methoxy]cyclohexyl}benzamide;

(23) 4-(furo[3,2-c]pyridin-4-yl)-N-(trans-4-hydroxy-4-methylcyclohexyl)benzamide;

(24) 4-(furo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.2]octan-1-yl)benzamide;

(25) 4-(furo[3,2-c]pyridin-4-yl)-N-[trans-4-(methoxy-d_3)cyclohexyl]benzamide;

(26) 4-(furo[3,2-c]pyridin-4-yl)-N-(trans-4-isopropoxycyclohexyl)benzamide;

(27) N-{trans-4-[(2,2-

difluoroethyl)amino]cyclohexyl}-4-(furo[3,2-c]pyridin-4-yl)benzamide;

(28) 4-(furo[3,2-c]pyridin-4-yl)-N-[trans-4-(oxetan-3-ylamino)cyclohexyl]benzamide;

(29) 4-[6-(hydroxymethyl)furo[3,2-c]pyridin-4-yl]-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(30) 4-[6-(hydroxymethyl-d_2)furo[3,2-c]pyridin-4-yl]-N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide;

(31) 3-fluoro-4-(furo[3,2-c]pyridin-4-yl)-N-[trans-4-(2-hydroxy-2-methylpropoxy)cyclohexyl]benzamide;

(32) N-[trans-4-(1-hydroxycyclopropyl)cyclohexyl]-4-(6-methylfuro[3,2-c]pyridin-4-yl)benzamide;

(33) N-[1-(pyrimidin-2-yl)piperidin-4-yl]-4-(1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

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

(35) N-[trans-4-(2-hydroxypropan-2-yl)cyclohexyl]-4-(6-methyl-1H-pyrrolo[3,2-c]pyridin-4-yl)benzamide;

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

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

(38) N-[trans-4-(2-hydroxy-2-methylpropoxy)cyclohexyl]-4-(6-methylfuro[3,2-c]pyridin-4-yl)benzamide;

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

(40) N-(trans-4-hydroxy-4-methylcyclohexyl)-4-(6-methylfuro[3,2-c]pyridin-4-yl)benzamide;

(41) 3-fluoro-4-(furo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.2]octan-1-yl)benzamide;

(42) 3-fluoro-4-(furo[3,2-c]pyridin-4-yl)-N-(trans-4-hydroxy-4-methylcyclohexyl)benzamide;

(43) 3-fluoro-4-(furo[3,2-c]pyridin-4-yl)-N-{trans-4-[(1-hydroxycyclopropyl)methoxy]cyclohexyl}benzamide;

(44) 4-(furo[3,2-c]pyridin-4-yl)-N-[cis-4-(2-hydroxy-2-methylpropoxy)cyclohexyl]benzamide;

(45) 4-(furo[3,2-c]pyridin-4-yl)-N-(4-hydroxybicyclo[2.2.1]heptan-1-yl)benzamide;

(46) N-(4-cyanobicyclo[2.2.2]octan-1-yl)-4-(furo[3,2-c]pyridin-4-yl)benzamide;

(47) 4-[4-(furo[3,2-c]pyridin-4-yl)benzamide]bicyclo[2.2.2]octane-1-carboxamide;

(48) 4-(furo[3,2-c]pyridin-4-yl)-N-{cis-4-[(1-hydroxycyclopropyl)methoxy]cyclohexyl}benzamide; and

(49) 4-(furo[3,2-c]pyridin-4-yl)-N-[cis-4-(2-hydroxypropan-2-yl)cyclohexyl]benzamide.

27. A pharmaceutical composition, comprising:

the compound according to any one of claims 1 to 26 or a pharmaceutically acceptable salt thereof.

28. Use of a pharmaceutical composition comprising the compound according to any one of claims 1 to 26 or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for preventing or treating a disease involving H-PGDS.

29. The use according to claim 28, 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.

30. An H-PGDS inhibitor, comprising:

the compound according to any one of claims 1 to 26 or a pharmaceutically acceptable salt thereof.

31. A pharmaceutical composition comprising the compound according to any one of claims 1 to 26 or a pharmaceutically acceptable salt thereof for use in therapy.