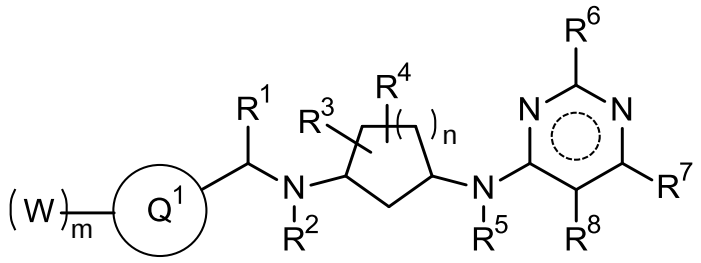
CLAIMS

1. A compound represented by the following general formula (1) or a pharmaceutically acceptable salt thereof:

[Formula 1]



(1)

wherein

the dotted circle indicates that the ring is aromatic,

R^1 and R^2 are each independently a hydrogen atom or a C_{1-6} alkyl group,

one of R^3 and R^4 is a hydrogen atom, a hydroxy group, a halogen atom, a C_{1-6} alkoxy group, a di(C_{1-6} alkyl)carbamoyl group, or an oxazolyl group, and

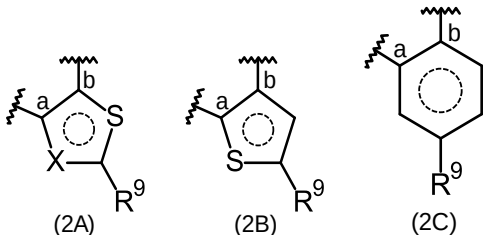
the other of R^3 and R^4 is a hydrogen atom, a hydroxy group, a halogen atom, or a C_{1-6} alkoxy group,

R^5 is a hydrogen atom, a C_{1-6} alkyl group, or a hydroxy C_{1-6} alkyl group,

R^6 is a hydrogen atom, a C_{1-6} alkyl group, a halogen atom, a C_{1-6} alkoxy group, an amino group, or a C_{1-6} alkylamino group,

R^7 and R^8 are taken together with the carbon atom to which R^7 is bonded and the carbon atom to which R^8 is bonded to form any of the following formulas (2A) to (2C):

[Formula 2]



(2A) (2B) (2C)

wherein

the dotted circle indicates that the ring is aromatic,

the carbon atom marked with a is the carbon atom to which R^8 is bonded,

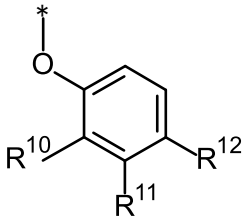
the carbon atom marked with b is the carbon atom to which R^7 is bonded,

X is CH or a nitrogen atom, and

R^9 is a halogeno C_{1-6} alkyl group, a C_{3-8} cycloalkyl group, a C_{3-8} cycloalkyl C_{1-6} alkyl group, a C_{1-6} alkoxy C_{1-6} alkyl group, or an oxetanyl group, or

R^7 is a hydrogen atom, and R^8 is the following formula (3):

[Formula 3]



(3)

wherein

* indicates a bonding site,

R^{10} is a di(C_{1-6} alkyl)carbamoyl group, a (C_{1-6} alkyl)pyrimidinyl group, a (C_{1-6} alkyl)phenyl group, or a (C_{1-6} alkyl)pyrazolyl group,

R^{11} is a hydrogen atom or a halogen atom, and

R^{12} is a halogen atom,

m is 1 or 0,

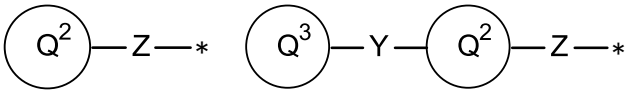
n is 1 or 2,

Ring Q^1 is a 6-membered aromatic ring optionally containing one nitrogen atom in the ring (the aromatic ring optionally has one or two substituents independently selected from the following Group A), a 5-membered aromatic heterocycle containing, in the ring, one or two heteroatoms independently selected from the group consisting of a nitrogen atom and a sulfur atom (the aromatic heterocycle optionally has one substituent independently selected from the following Group A), a C_{3-8} cycloalkane ring optionally having one substituent independently selected from the following Group A, a C_{4-8} cycloalkene ring optionally having one substituent

independently selected from the following Group A, a 4- to 8-membered saturated heterocycle containing one nitrogen atom in the ring (the saturated heterocycle optionally has one substituent independently selected from the following Group A), or a 9-membered bicyclic aromatic heterocycle containing one nitrogen atom in the ring (the bicyclic aromatic heterocycle optionally has one or two substituents independently selected from the following Group B), and

W is the following formula (4A) or (4B):

[Formula 4]



(4A) (4B)

wherein

* indicates a bonding site,

Ring Q^2 is a 6-membered aromatic ring optionally containing one nitrogen atom in the ring (the aromatic ring optionally has one to three substituents independently selected from the following Group C), a 6-membered aromatic heterocycle containing two nitrogen atoms in the ring (the aromatic heterocycle optionally has one to three substituents independently selected from the following Group C), a 5-membered aromatic heterocycle containing, in the ring, one to three heteroatoms independently selected from the group consisting of a nitrogen atom, an oxygen atom and a sulfur atom (the aromatic heterocycle optionally has one substituent independently selected from the following Group C), a 9- or 10-membered bicyclic aromatic or partially unsaturated heterocycle containing, in the ring, one to three heteroatoms independently selected from the group consisting of a nitrogen atom and an oxygen atom (the bicyclic aromatic or partially unsaturated heterocycle optionally has one or two substituents independently selected from the following Group D), a 5- to 8-membered saturated heterocycle containing, in the ring, one or two

heteroatoms independently selected from the group consisting of an oxygen atom and a nitrogen atom (the saturated heterocycle optionally has one substituent independently selected from the following Group E), or a C_{3-8} cycloalkane ring optionally having one substituent independently selected from the following Group E,

Ring Q^3 is a 4- to 8-membered saturated heterocycle containing one nitrogen atom or one oxygen atom in the ring (the saturated heterocycle optionally has one C_{1-6} alkylsulfonyl group), or a 6-membered aromatic ring optionally containing one nitrogen atom in the ring (the aromatic ring optionally has one substituent independently selected from the following Group F),

Y is a single bond or an oxygen atom, and

Z is a single bond, an oxygen atom, -NH-, $-SO_2-$, a C_{1-6} alkylene group, *-R^{13}-NHC(=O)-**, *-R^{14}-O-**, or *-R^{15}-NH-**, wherein * is bonded to Ring Q^2, ** is bonded to Ring Q^1, and R^{13}, R^{14} and R^{15} are each independently a C_{1-6} alkylene group,

Group A: a halogen atom, a hydroxy group, a C_{1-6} alkyl group, a C_{1-6} alkoxy group, a hydroxy C_{1-6} alkoxy group, a vinylsulfonylamino(C_{1-6} alkyl)carbamoyl group, and a prop-2-enoylamino(C_{1-6} alkyl)carbamoyl group,

Group B: a cyano group, a C_{1-6} alkyl group, a halogen atom, and a C_{1-6} alkoxy group,

Group C: a halogen atom, a C_{1-6} alkyl group, a C_{1-6} alkoxy group, a C_{1-6} alkyl(C_{1-6} alkylsulfonyl)amino group, a cyano group, a C_{1-6} alkylsulfonyl group, a C_{1-6} alkylamino group, a di(C_{1-6} alkyl)amino group, a halogeno C_{1-6} alkyl group, a C_{1-6} alkoxy C_{1-6} alkoxy group, a halogeno C_{1-6} alkoxy group, a C_{1-6} alkylsulfonyl C_{1-6} alkyl group, a di(C_{1-6} alkyl)sulfamoyl group, a C_{1-6} alkylenedioxy group, a (C_{1-6} alkyl)carbamoyl group, a hydroxy C_{1-6} alkyl group, a 2-C_{3-6} alkenoylamino group, a C_{1-6} alkyl (2-C_{3-6} alkenoyl)amino group, a hydroxy group, an oxo group, a ($^2H_3$)methoxy group, and a bis[($^2H_3$)methyl]amino group,

Group D: a halogen atom, a C_{1-6} alkyl group, and a C_{1-6}

alkylsulfonyl group,

Group E: an oxo group, a hydroxy group, and a C_{1-6} alkoxy group, and

Group F: a halogen atom, and a C_{1-6} alkoxy group.

2. The compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein R^1 is a hydrogen atom or a methyl group.

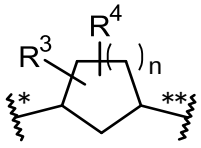
3. The compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein R^1 is a hydrogen atom.

4. The compound according to any one of claims 1 to 3, or a pharmaceutically acceptable salt thereof, wherein R^2 is a hydrogen atom or a methyl group.

5. The compound according to any one of claims 1 to 3, or a pharmaceutically acceptable salt thereof, wherein R^2 is a hydrogen atom.

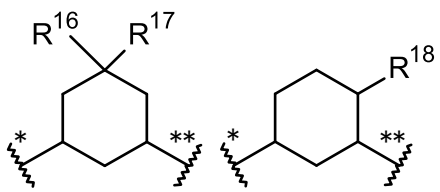
6. The compound according to any one of claims 1 to 5, or a pharmaceutically acceptable salt thereof, wherein the moiety represented by the following formula (5) in the formula (1) is the following formula (5A) or (5B):

[Formula 5]



(5)

[Formula 6]



(5A) (5B)

wherein

* is bonded to the nitrogen atom to which R^2 is bonded,

** is bonded to the nitrogen atom to which R^5 is bonded,

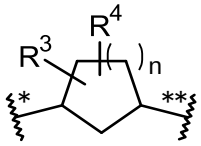
R^{16} is a hydrogen atom, a halogen atom, a hydroxy group, a di(C_{1-6} alkyl)carbamoyl group, an oxazol-2-yl group, or a C_{1-6} alkoxy group,

R^{17} is a hydrogen atom or a halogen atom, and

R^{18} is a C_{1-6} alkoxy group.

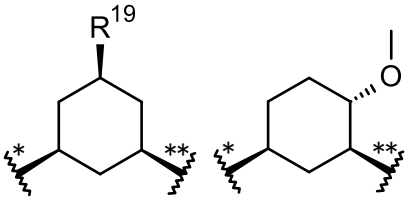
7. The compound according to any one of claims 1 to 5, or a pharmaceutically acceptable salt thereof, wherein the moiety represented by the following formula (5) in the formula (1) is the following formula (6A) or (6B):

[Formula 7]



(5)

[Formula 8]



(6A) (6B)

wherein

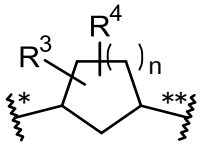
* is bonded to the nitrogen atom to which R^2 is bonded,

** is bonded to the nitrogen atom to which R^5 is bonded, and

R^{19} is a hydrogen atom, a hydroxy group, a dimethylcarbamoyl group, an oxazol-2-yl group, or a methoxy group.

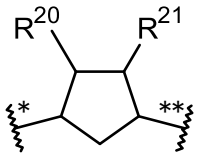
8. The compound according to any one of claims 1 to 5, or a pharmaceutically acceptable salt thereof, wherein the moiety represented by the following formula (5) in the formula (1) is the following formula (7A):

[Formula 9]



(5)

[Formula 10]



(7A)

wherein

* is bonded to the nitrogen atom to which R^2 is bonded,

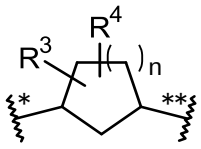
** is bonded to the nitrogen atom to which R^5 is bonded,

R^{20} is a hydrogen atom or a hydroxy group, and

R^{21} is a hydrogen atom, a hydroxy group, or a C_{1-6} alkoxy group.

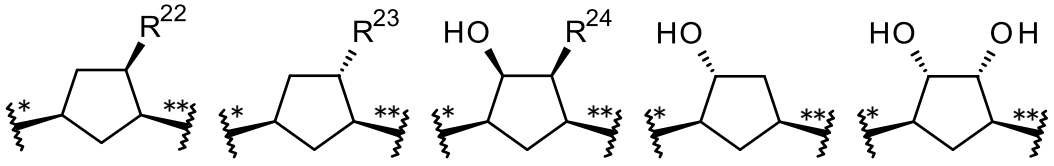
9. The compound according to any one of claims 1 to 5, or a pharmaceutically acceptable salt thereof, wherein the moiety represented by the following formula (5) in the formula (1) is any of the following formulas (8A) to (8E):

[Formula 11]



(5)

[Formula 12]



(8A) (8B) (8C) (8D) (8E)

wherein

* is bonded to the nitrogen atom to which R^2 is bonded,

** is bonded to the nitrogen atom to which R^5 is bonded,

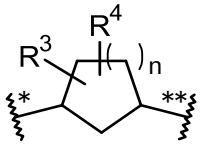
R^{22} is a hydrogen atom, a hydroxy group or a methoxy group,

R^{23} is a hydroxy group or a methoxy group, and

R^{24} is a hydrogen atom or a hydroxy group.

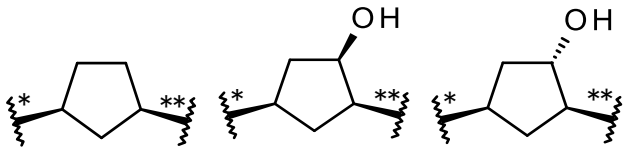
10. The compound according to any one of claims 1 to 5, or a pharmaceutically acceptable salt thereof, wherein the moiety represented by the following formula (5) in the formula (1) is any of the following formulas (9A) to (9C):

[Formula 13]



(5)

[Formula 14]



(9A) (9B) (9C)

wherein

* is bonded to the nitrogen atom to which R^2 is bonded, and

** is bonded to the nitrogen atom to which R^5 is bonded.

11. The compound according to any one of claims 1 to 10, or a pharmaceutically acceptable salt thereof, wherein R^5 is a hydrogen atom, a methyl group, an ethyl group, or a 2-hydroxyethyl group.

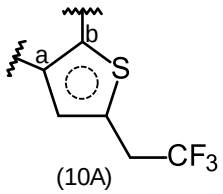
12. The compound according to any one of claims 1 to 10, or a pharmaceutically acceptable salt thereof, wherein R^5 is a methyl group.

13. The compound according to any one of claims 1 to 12, or a pharmaceutically acceptable salt thereof, wherein R^6 is a hydrogen atom, a methyl group, a chlorine atom, a methoxy group, an amino group, or a methylamino group.

14. The compound according to any one of claims 1 to 13, or a

pharmaceutically acceptable salt thereof, wherein R^7 and R^8 are taken together with the carbon atom to which R^7 is bonded and the carbon atom to which R^8 is bonded to form the following formula (10A):

[Formula 15]



(10A)

wherein

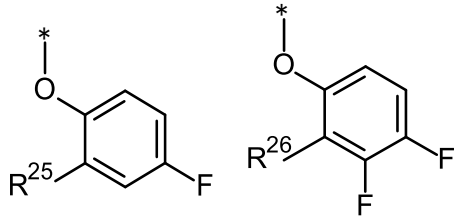
the dotted circle indicates that the ring is aromatic,

the carbon atom marked with a is the carbon atom to which R^8 is bonded, and

the carbon atom marked with b is the carbon atom to which R^7 is bonded.

15. The compound according to any one of claims 1 to 13, or a pharmaceutically acceptable salt thereof, wherein R^7 is a hydrogen atom, and R^8 is the following formula (11A) or (11B):

[Formula 16]



(11A) (11B)

wherein

* indicates a bonding site,

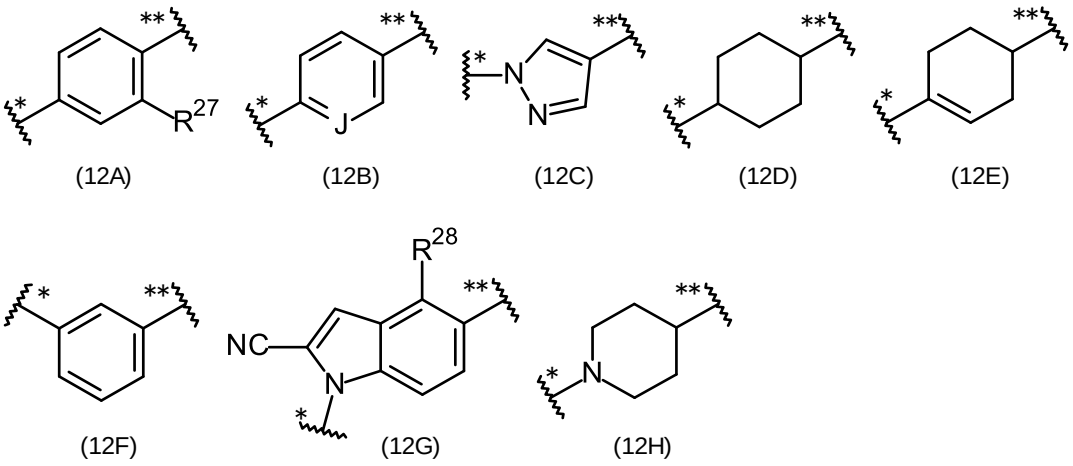
R^{25} is a diisopropylcarbamoyl group, a 4-isopropylpyrimidin-5-yl group, a 2-isopropylphenyl group, or a 1-isopropylpyrazol-5-yl group, and

R^{26} is a diisopropylcarbamoyl group.

16. The compound according to any one of claims 1 to 15, or a pharmaceutically acceptable salt thereof, wherein Ring Q^1 is any of the following (i) to (vii):

(i) a benzene ring optionally having one or two substituents independently selected from the above Group A;
(ii) a pyridine ring optionally having one or two substituents independently selected from the above Group A;
(iii) a 1,3-thiazole ring or a pyrazole ring (the 1,3-thiazole ring or pyrazole ring optionally has one substituent independently selected from the above Group A);
(iv) a cyclohexane ring optionally having one substituent independently selected from the above Group A;
(v) a cyclohexene ring optionally having one substituent independently selected from the above Group A;
(vi) a piperidine ring optionally having one substituent independently selected from the above Group A; or
(vii) an indole ring optionally has one or two substituents independently selected from the above Group B.

17. The compound according to any one of claims 1 to 15, or a pharmaceutically acceptable salt thereof, wherein
m is 1, and
Ring Q^1 is any of the following formulas (12A) to (12H):
[Formula 17]



wherein
* is bonded to Z,
** is bonded to the carbon atom to which R^1 is bonded,
R^{27} is a hydrogen atom, a halogen atom, a C_{1-6} alkoxy group, or a C_{1-6} alkyl group,

J is a nitrogen atom or CR^{29},

R^{29} is a halogen atom, and

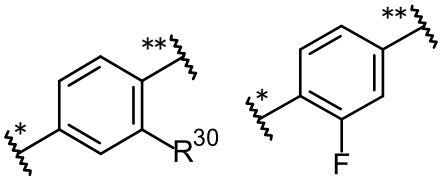
R^{28} is a hydrogen atom or a C_{1-6} alkyl group.

18. The compound according to any one of claims 1 to 15, or a pharmaceutically acceptable salt thereof, wherein

m is 1, and

Ring Q^1 is the following formula (13A) or (13B):

[Formula 18]



(13A) (13B)

wherein

* is bonded to Z,

** is bonded to the carbon atom to which R^1 is bonded, and

R^{30} is a hydrogen atom, a fluorine atom, a methyl group, or a methoxy group.

19. The compound according to any one of claims 1 to 18, or a pharmaceutically acceptable salt thereof, wherein Ring Q^2 is any of the following (i) to (vii):

(i) a benzene ring optionally having one to three substituents independently selected from the above Group C;

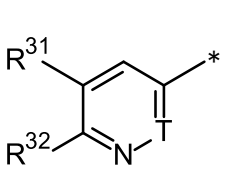
(ii) a pyridine ring optionally having one to three substituents independently selected from the above Group C;

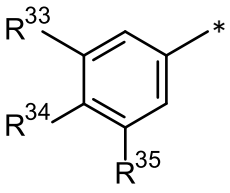
(iii) a pyridazine ring, a pyrazine ring or a pyrimidine ring (the pyridazine ring, pyrazine ring or pyrimidine ring optionally has one to three substituents independently selected from the above Group C);

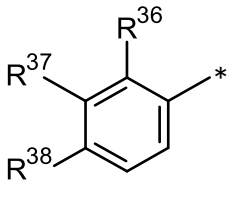
(iv) a pyrazole ring, an imidazole ring, a 1,3-thiazole ring, a 1,3-oxazole ring or a 4H-1,2,4-triazole ring (the pyrazole ring, imidazole ring, 1,3-thiazole ring, 1,3-oxazole ring or 4H-1,2,4-triazole ring optionally has one substituent

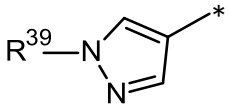
independently selected from the above Group C);
(v) an isoquinoline ring, an indazole ring, a benzimidazole ring, a 1H-pyrrolo[2,3-c]pyridine ring, a 1H-pyrrolo[3,2-c]pyridine ring, a furo[3,2-b]pyridine ring, a 1H-pyrazolo[3,4-c]pyridine ring or an indoline ring (the isoquinoline ring, indazole ring, benzimidazole ring, 1H-pyrrolo[2,3-c]pyridine ring, 1H-pyrrolo[3,2-c]pyridine ring, furo[3,2-b]pyridine ring, 1H-pyrazolo[3,4-c]pyridine ring or indoline ring optionally has one or two substituents independently selected from the above Group D);
(vi) a pyrrolidine ring, a piperidine ring, a morpholine ring or an azepane ring (the pyrrolidine ring, piperidine ring, morpholine ring or azepane ring optionally has one substituent independently selected from the above Group E); or
(vii) a cyclohexane ring optionally having one substituent independently selected from the above Group E.

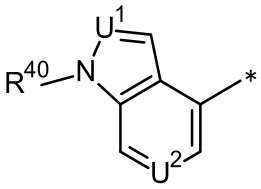
20. The compound according to any one of claims 1 to 18, or a pharmaceutically acceptable salt thereof, wherein
W is the above formula (4A); and
Ring Q^2 is any of the following formulas (14A) to (14F):
[Formula 19]

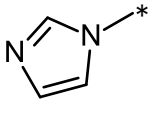

(14A)


(14B)


(14C)


(14D)


(14E)


(14F)

wherein
* indicates a bonding site,
T is CH or a nitrogen atom,

R^{31} is a hydrogen atom, a C_{1-6} alkoxy group, a halogeno C_{1-6} alkoxy group, or a ($^2H_3$)methoxy group,

R^{32} is a hydrogen atom, a C_{1-6} alkyl group, a halogen atom, a C_{1-6} alkoxy group, a cyano group, a di(C_{1-6} alkyl)amino group, a halogeno C_{1-6} alkyl group, a C_{1-6} alkylamino group, a C_{1-6} alkylsulfonyl group, a C_{1-6} alkoxy C_{1-6} alkoxy group, a halogeno C_{1-6} alkoxy group, a hydroxy C_{1-6} alkyl group, a C_{1-6} alkyl (2-C_{3-6} alkenoyl)amino group, a ($^2H_3$)methoxy group, or a bis[($^2H_3$)methyl]amino group, or

R^{31} and R^{32} are taken together to form an ethylenedioxy group,

R^{33} and R^{35} are each independently a hydrogen atom, a halogen atom, a C_{1-6} alkoxy group, a C_{1-6} alkyl(C_{1-6} alkylsulfonyl)amino group, a (C_{1-6} alkyl)carbamoyl group, a di(C_{1-6} alkyl)sulfamoyl group, a 2-C_{3-6} alkenoylamino group, or a C_{1-6} alkylsulfonyl C_{1-6} alkyl group,

R^{34} is a hydrogen atom or a halogen atom,

R^{36} is a halogen atom,

R^{37} is a C_{1-6} alkoxy group,

R^{38} is a halogen atom,

R^{39} is a C_{1-6} alkyl group or a C_{1-6} alkylsulfonyl group,

R^{40} is a C_{1-6} alkyl group or a C_{1-6} alkylsulfonyl group,

U^1 is CH or a nitrogen atom,

U^2 is CR^{41} or a nitrogen atom, and

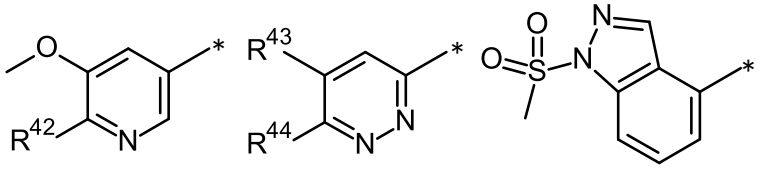
R^{41} is a hydrogen atom or a halogen atom.

21. The compound according to any one of claims 1 to 18, or a pharmaceutically acceptable salt thereof, wherein

W is the above formula (4A); and

Ring Q^2 is any of the following formulas (15A) to (15C):

[Formula 20]



(15A) (15B) (15C)

wherein

* indicates a bonding site,

R^{42} is a methyl group, a chlorine atom, a methoxy group, a cyano group, a dimethylamino group, or a bis[($^2H_3$)methyl]amino group,

R^{43} is a methoxy group or a ($^2H_3$)methoxy group, and

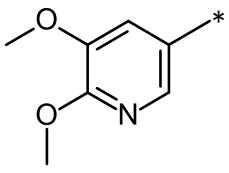
R^{44} is a chlorine atom, a methoxy group, a methoxyethoxy group, a dimethylamino group, a difluoromethoxy group, or a ($^2H_3$)methoxy group.

22. The compound according to any one of claims 1 to 18, or a pharmaceutically acceptable salt thereof, wherein

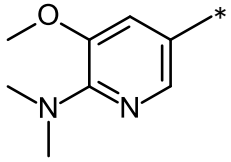
W is the above formula (4A); and

Ring Q^2 is any of the following formulas (16A) to (16G):

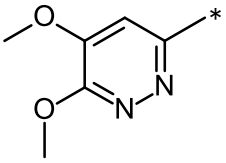
[Formula 21]



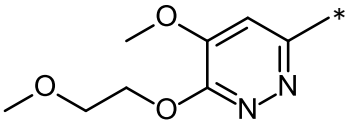
(16A)



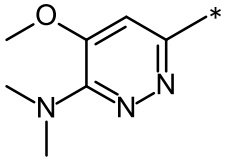
(16B)



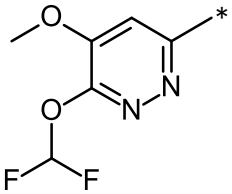
(16C)



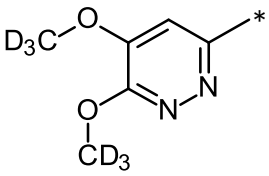
(16D)



(16E)



(16F)



(16G)

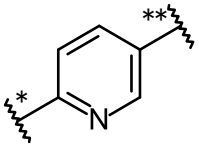
wherein * indicates a bonding site.

23. The compound according to any one of claims 1 to 18, or a pharmaceutically acceptable salt thereof, wherein

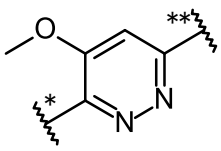
W is the above formula (4B); and

Ring Q^2 is the following formula (17A) or (17B):

[Formula 22]



(17A)



(17B)

wherein

* is bonded to Y, and

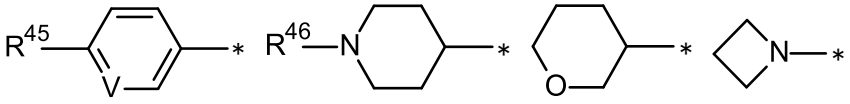
** is bonded to Z.

24. The compound according to any one of claims 1 to 19 and 23, or a pharmaceutically acceptable salt thereof, wherein

W is the above formula (4B); and

Ring Q^3 is any of the following formulas (18A) to (18D):

[Formula 23]



(18A) (18B) (18C) (18D)

wherein

* indicates a bonding site,

R^{45} is a hydrogen atom or a halogen atom,

R^{46} is a C_{1-6} alkylsulfonyl group, and

V is a nitrogen atom or CH.

25. The compound according to any one of claims 1 to 19 and 23, or a pharmaceutically acceptable salt thereof, wherein

W is the above formula (4B); and

Ring Q^3 is a phenyl group, an azetidin-1-yl group, a 3-pyridyl group, a 6-chloro-3-pyridyl group, a tetrahydropyran-3-yl group, or a 1-methylsulfonyl-4-piperidyl group.

26. The compound according to any one of claims 1 to 19 and 23 to 25, or a pharmaceutically acceptable salt thereof, wherein

W is the above formula (4B); and

Y is a single bond or an oxygen atom.

27. The compound according to any one of claims 1 to 26, or a pharmaceutically acceptable salt thereof, wherein Z is a single bond, -NH-, an oxygen atom, $-SO_2-$, $-CH_2-$, *-CH_2-NHC(=O)-**, *-CH_2CH_2-O-**, or *-CH_2-NH-**, wherein * is bonded to Ring Q^2, and ** is bonded to Ring Q^1.

28. The compound according to any one of claims 1 to 26, or a pharmaceutically acceptable salt thereof, wherein Z is a single bond.

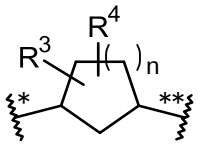
29. The compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein

R^1 is a hydrogen atom;

R^2 is a hydrogen atom;

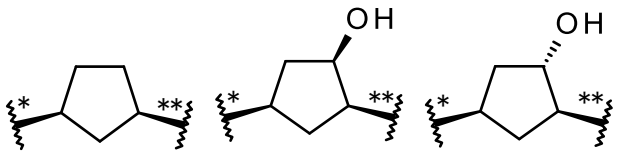
the moiety represented by the following formula (5) is any of the following formulas (9A) to (9C):

[Formula 24]



(5)

[Formula 25]



(9A) (9B) (9C)

wherein

* is bonded to the nitrogen atom to which R^2 is bonded, and

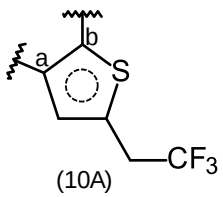
** is bonded to the nitrogen atom to which R^5 is bonded;

R^5 is a methyl group;

R^6 is a hydrogen atom, a methyl group, a chlorine atom, a methoxy group, an amino group, or a methylamino group;

R^7 and R^8 are taken together with the carbon atom to which R^7 is bonded and the carbon atom to which R^8 is bonded to form the following formula (10A):

[Formula 26]



(10A)

wherein

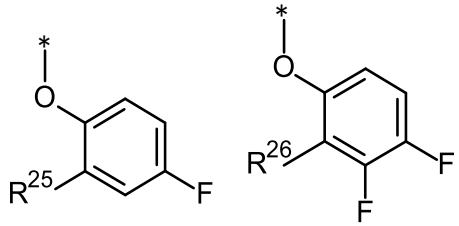
the dotted circle indicates that the ring is aromatic,

the carbon atom marked with a is the carbon atom to which R^8 is bonded, and

the carbon atom marked with b is the carbon atom to which R^7 is bonded, or

R^7 is a hydrogen atom, and R^8 is the following formula (11A) or (11B):

[Formula 27]



(11A) (11B)

wherein

* indicates a bonding site,

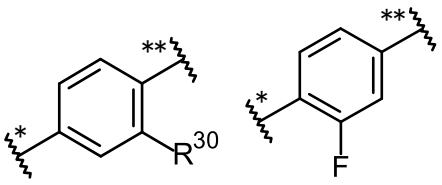
R^{25} is a diisopropylcarbamoyl group, a 4-isopropylpyrimidin-5-yl group, a 2-isopropylphenyl group, or a 1-isopropylpyrazol-5-yl group, and

R^{26} is a diisopropylcarbamoyl group;

m is 1;

Ring Q^1 is the following formula (13A) or (13B):

[Formula 28]



(13A) (13B)

wherein

* is bonded to Z,

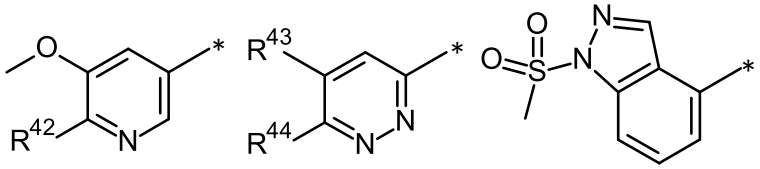
** is bonded to the carbon atom to which R^1 is bonded, and

R^{30} is a hydrogen atom, a fluorine atom, a methyl group, or a methoxy group;

W is the above formula (4A), and

Ring Q^2 is any of the following formulas (15A) to (15C):

[Formula 29]



(15A) (15B) (15C)

wherein

* indicates a bonding site,

R^{42} is a methyl group, a chlorine atom, a methoxy group, a cyano group, a dimethylamino group, or a bis[($^2H_3$)methyl]amino group,

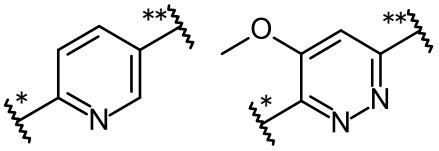
R^{43} is a methoxy group or a ($^2H_3$)methoxy group, and

R^{44} is a chlorine atom, a methoxy group, a methoxyethoxy group, a dimethylamino group, a difluoromethoxy group, or a ($^2H_3$)methoxy group, or

W is the above formula (4B),

Ring Q^2 is the following formula (17A) or (17B):

[Formula 30]



(17A) (17B)

wherein

* is bonded to Y, and

** is bonded to Z,

Ring Q^3 is a phenyl group, an azetidin-1-yl group, a 3-pyridyl group, a 6-chloro-3-pyridyl group, a tetrahydropyran-3-yl group, or a 1-methylsulfonyl-4-piperidyl group, and

Y is a single bond or an oxygen atom; and

Z is a single bond.

30. The compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein

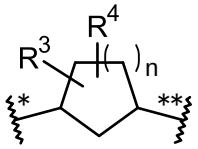
R^1 is a hydrogen atom;

R^2 is a hydrogen atom;

the moiety represented by the following formula (5) is any of

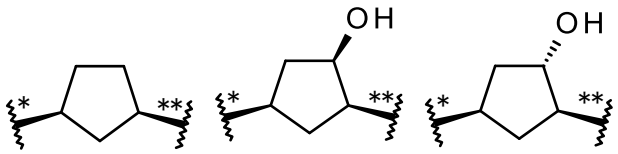
the following formulas (9A) to (9C):

[Formula 31]



(5)

[Formula 32]



(9A) (9B) (9C)

wherein

* is bonded to the nitrogen atom to which R^2 is bonded, and

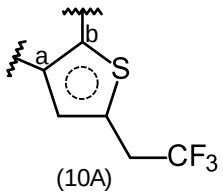
** is bonded to the nitrogen atom to which R^5 is bonded;

R^5 is a methyl group;

R^6 is a hydrogen atom, a methyl group, a chlorine atom, a methoxy group, an amino group, or a methylamino group;

R^7 and R^8 are taken together with the carbon atom to which R^7 is bonded and the carbon atom to which R^8 is bonded to form the following formula (10A):

[Formula 33]



(10A)

wherein

the dotted circle indicates that the ring is aromatic,

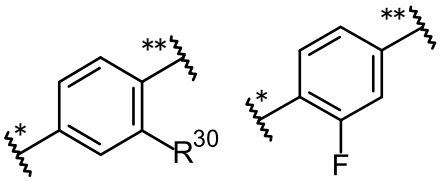
the carbon atom marked with a is the carbon atom to which R^8 is bonded, and

the carbon atom marked with b is the carbon atom to which R^7 is bonded;

m is 1;

Ring Q^1 is the following formula (13A) or (13B):

[Formula 34]



(13A) (13B)

wherein

* is bonded to Z,

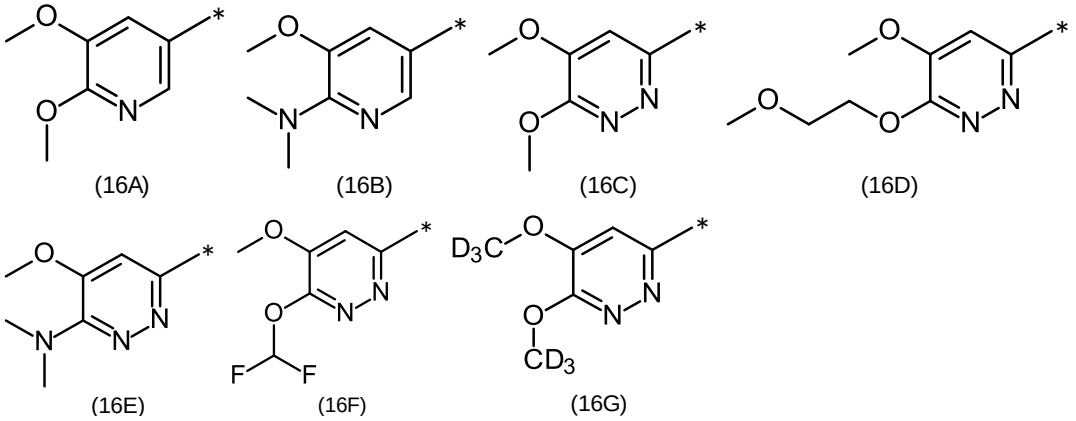
** is bonded to the carbon atom to which R^1 is bonded, and

R^{30} is a hydrogen atom, a fluorine atom, a methyl group, or a methoxy group;

W is the above formula (4A); and

Ring Q^2 is any of the following formulas (16A) to (16G):

[Formula 35]



(16A) (16B) (16C) (16D)

(16E) (16F) (16G)

wherein * indicates a bonding site; and

Z is a single bond.

31. Any compound selected from the following group, or a pharmaceutically acceptable salt thereof.

5-[4-({[(1R,3R,4S)-3-hydroxy-4-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentyl]amino}methyl)phenyl]-3-methoxypyridine-2-carbonitrile,

(1R,2S,4R)-4-[({4-[1-(methanesulfonyl)-1H-indazol-4-yl]phenyl}methyl)amino]-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-

yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-[({4-[6-(dimethylamino)-5-methoxypyridin-3-yl]phenyl}methyl)amino]-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(5-methoxy-6-methylpyridin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(1H-imidazol-1-yl)phenyl]methyl}amino)-2-{methyl[2-(methylamino)-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(6-chloro-5-methoxypyridin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(5,6-dimethoxypyridin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(6-fluoro-5-methoxypyridin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(5,6-dimethoxypyridin-3-yl)phenyl]methyl}amino)-2-{methyl[2-(methylamino)-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,

(1R,2S,4R)-4-({[4-(5,6-dimethoxypyridin-3-

yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol,
(1R,2S,4R)-4-({[4-(6-chloro-5-methoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,
2-[(4-{[(1S,2R,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-hydroxycyclopentyl](methyl)amino}pyrimidin-5-yl)oxy]-5-fluoro-N,N-di(propan-2-yl)benzamide,
(1R,2S,4R)-2-{[2-chloro-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)cyclopentan-1-ol,
(1R,3S)-N^3-{[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}-N^1-methyl-N^1-[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]cyclopentane-1,3-diamine,
(1R,2S,4R)-4-[({4-[6-(dimethylamino)-5-methoxypyridazin-3-yl]phenyl}methyl)amino]-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,
6-[4-({[(1R,3R,4S)-3-hydroxy-4-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentyl]amino}methyl)phenyl]-4-methoxypyridazine-3-carbonitrile,
(1S,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,
(1R,2S,4R)-4-[({4-[5-methoxy-6-(2-methoxyethoxy)pyridazin-3-yl]phenyl}methyl)amino]-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol,
(1R,2S,4R)-4-({[4-(4,5-dimethoxypyridin-2-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-

trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol,
(1R,2S,4R)-4-[({4-[6-(dimethylamino)-5-methoxypyridin-3-yl]phenyl}methyl)amino]-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol,
(1R,2S,4R)-4-[({4-[6-(difluoromethoxy)-5-methoxypyridazin-3-yl]phenyl}methyl)amino]-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol,
(1R,2S,4R)-4-{[(4-{5,6-bis[($^{2}H_3$)methyloxy]pyridazin-3-yl}phenyl)methyl]amino}-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol,
(1R,2S,4R)-4-({[4-(6-{bis[($^{2}H_3$)methyl]amino}-5-methoxypyridin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol, and
(1R,2S,4R)-4-{[(4-{5,6-bis[($^{2}H_3$)methyloxy]pyridazin-3-yl}phenyl)methyl]amino}-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol.

32. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol or a pharmaceutically acceptable salt thereof.

33. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol succinate.

34. The compound according to claim 1, which is (1R,2S,4R)-4-

({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol benzenesulfonate.

35. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol maleate.

36. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol fumarate.

37. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol or a pharmaceutically acceptable salt thereof.

38. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol fumarate.

39. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol mucate.

40. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol adipate.

41. The compound according to claim 1, which is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol succinate.

42. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol succinate, having at least five peaks at diffraction angles (2θ) selected from 4.66±0.2, 7.02±0.2, 14.10±0.2, 16.68±0.2, 17.46±0.2, 18.68±0.2, 21.34±0.2, 24.52±0.2, 25.54±0.2 and 28.22±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

43. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol benzenesulfonate, having at least five peaks at diffraction angles (2θ) selected from 10.92±0.2, 11.70±0.2, 12.40±0.2, 15.00±0.2, 17.38±0.2, 18.16±0.2, 22.18±0.2, 22.62±0.2, 23.86±0.2 and 24.20±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

44. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol maleate, having at least five peaks at diffraction angles (2θ) selected from 4.64±0.2, 7.02±0.2, 7.46±0.2, 11.14±0.2, 14.04±0.2, 16.76±0.2, 18.54±0.2, 19.76±0.2, 21.26±0.2 and 22.62±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

45. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{methyl[6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl]amino}cyclopentan-1-ol fumarate, having at least five peaks at diffraction angles (2θ) selected from 4.80±0.2, 7.94±0.2, 9.66±0.2, 11.56±0.2, 14.56±0.2, 17.62±0.2, 18.14±0.2, 20.46±0.2, 21.36±0.2 and 24.46±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

46. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol, having at least five peaks at diffraction angles (2θ) selected from 7.14±0.2, 8.76±0.2, 12.26±0.2, 14.30±0.2, 17.52±0.2, 23.40±0.2, 24.40±0.2, 24.86±0.2, 25.34±0.2 and 25.90±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

47. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol fumarate, having at least five peaks at diffraction angles (2θ) selected from 8.06±0.2, 12.22±0.2, 12.52±0.2, 15.14±0.2, 17.54±0.2, 18.56±0.2, 20.08±0.2, 23.48±0.2, 24.28±0.2 and 25.00±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

48. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-

yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol mucate, having at least five peaks at diffraction angles (2θ) selected from 6.56±0.2, 9.44±0.2, 9.94±0.2, 13.20±0.2, 18.22±0.2, 18.86±0.2, 19.60±0.2, 22.68±0.2, 25.10±0.2 and 28.70±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

49. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol adipate, having at least five peaks at diffraction angles (2θ) selected from 5.88±0.2, 6.20±0.2, 9.18±0.2, 10.34±0.2, 12.50±0.2, 13.70±0.2, 15.66±0.2, 17.82±0.2, 18.48±0.2 and 22.16±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

50. A crystal of the compound according to claim 1, wherein the compound is (1R,2S,4R)-4-({[4-(5,6-dimethoxypyridazin-3-yl)phenyl]methyl}amino)-2-{[2-methoxy-6-(2,2,2-trifluoroethyl)thieno[2,3-d]pyrimidin-4-yl](methyl)amino}cyclopentan-1-ol succinate, having at least five peaks at diffraction angles (2θ) selected from 4.60±0.2, 6.60±0.2, 7.74±0.2, 8.02±0.2, 9.26±0.2, 11.16±0.2, 12.00±0.2, 12.44±0.2, 13.22±0.2 and 19.66±0.2 in a powder X-ray diffraction diagram obtained through irradiation with copper Kα line (λ = 1.54 angstroms).

51. An inhibitor of the interaction between menin and one or more proteins selected from the group consisting of MLL1, MLL2, a MLL fusion protein and a MLL partial tandem duplication protein, which comprises, as an active ingredient, the compound

according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50.

52. A pharmaceutical composition comprising the compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50, and a pharmaceutically acceptable carrier.

53. The pharmaceutical composition according to claim 52, for the treatment and/or prophylaxis of diseases that can be treated and/or prevented by inhibiting the interaction between menin and one or more proteins selected from the group consisting of MLL1, MLL2, a MLL fusion protein and a MLL partial tandem duplication protein.

54. The pharmaceutical composition according to claim 52, for the treatment and/or prophylaxis of diabetes.

55. The pharmaceutical composition according to claim 52, for the treatment of cancer.

56. The pharmaceutical composition according to claim 55, wherein the cancer is blood cancer, prostate cancer, breast cancer, hepatoma or pediatric glioma.

57. The pharmaceutical composition according to claim 55, wherein the cancer is blood cancer.

58. The pharmaceutical composition according to claim 57, wherein the blood cancer is acute myelogenous leukemia (AML) or acute lymphocytic leukemia (ALL).

59. ~~A method for treating and/or preventing diabetes, comprising administering~~ Use of the compound according to any

one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50 in the manufacture of a medicament for treating and/or preventing diabetes.

~~60. A method for treating cancer, comprising administering the compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50.~~

~~61~~60. The compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50, for use in the treatment of cancer.

~~62~~61. Use of the compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50, for the manufacture of a medicament for the treatment of cancer.

~~63~~62. The pharmaceutical composition according to claim 57, wherein the blood cancer is acute myelogenous leukemia (AML) with NPM1 mutation.

~~64~~63. A pharmaceutical composition comprising one drug selected from the group consisting of a Bcl-2 inhibitor, a DNA methyltransferase inhibitor and a pyrimidine antimetabolite, and the compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50, which are to be administered in combination.

~~65~~64. The pharmaceutical composition according to claim ~~64~~63, wherein the one drug selected from the group consisting of a Bcl-2 inhibitor, a DNA methyltransferase inhibitor and a

pyrimidine antimetabolite, and the compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50 are separately comprised as active ingredients in different formulations and to be administered at the same time or different times.

~~66~~65. The pharmaceutical composition according to claim ~~64~~63, wherein the one drug selected from the group consisting of a Bcl-2 inhibitor, a DNA methyltransferase inhibitor and a pyrimidine antimetabolite, and the compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50 are comprised in a single formulation.

~~67~~66. The pharmaceutical composition according to any of claims ~~64~~ 63 to ~~66~~65, wherein the one drug selected from the group consisting of a Bcl-2 inhibitor, a DNA methyltransferase inhibitor and a pyrimidine antimetabolite is Venetoclax.

~~68~~67. The pharmaceutical composition according to any of claims ~~64~~ 63 to ~~66~~65, wherein the one drug selected from the group consisting of a Bcl-2 inhibitor, a DNA methyltransferase inhibitor and a pyrimidine antimetabolite is Azacitidine.

~~69~~68. The pharmaceutical composition according to any of claims ~~64~~ 63 to ~~66~~65, wherein the one drug selected from the group consisting of a Bcl-2 inhibitor, a DNA methyltransferase inhibitor and a pyrimidine antimetabolite is Cytarabine.

~~70~~69. A composition for inducing differentiation of leukemia cells, comprising the compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50.

~~71~~70. ~~A method for inducing differentiation of leukemia cells, comprising administering~~ Use of the compound according to any one of claims 1 to 41, or a pharmaceutically acceptable salt thereof, or the crystal according to any one of claims 42 to 50 in the manufacture of a medicament for inducing differentiation of leukemia cells.