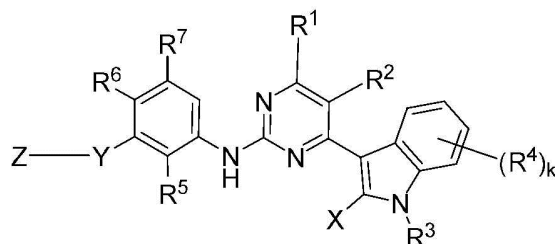


CLAIMS

[Claim 1] A compound selected from a compound represented by Formula 1, and a stereoisomer, tautomer, solvate, or pharmaceutically acceptable salt thereof.

[Formula 1]



wherein, in Formula 1,

R^1 is hydrogen, a halogen, a hydroxy group, a C_1 - C_4 alkoxy group, or -
 10 NR_aR_b ,

wherein R_a and R_b are each independently hydrogen or a C_1 - C_4 alkyl group;

R^2 is hydrogen, a halogen, a cyano group, a nitro group, an amino group, a carboxamide group, a formyl group, a halo C_1 - C_4 alkyl group, or a C_1 - C_4 alkyl
 15 group;

R^3 is hydrogen, a halogen, a hydroxy group, a halo C_1 - C_4 alkyl group, a C_1 - C_4 alkyl group, a C_2 - C_4 alkenyl group, or a C_2 - C_4 alkynyl group;

Each R^4 is independently hydrogen, a halogen, a hydroxy group, a cyano group, a nitro group, an amino group, $-S(=O)_l-R_c$, a halo C_1 - C_4 alkyl
 20 group, a C_1 - C_4 alkoxy group, a hydroxy C_1 - C_4 alkyl group, a C_1 - C_4 alkyl group, a C_2 - C_4 alkenyl group, a C_2 - C_4 alkynyl group, $-NR_dR_e$, $-CO_2R_e$, or $-CO-NR_dR_e$,

wherein R_c is a C_1 - C_4 alkyl group or $-NR_dR_e$,

R_d and R_e are each independently hydrogen or a C_1 - C_4 alkyl group,

l is an integer from 0 to 2, and

25 k is an integer from 0 to 4;

R^5 and R^6 are each independently hydrogen, a halogen, a hydroxy group, a nitro group, an amino group, a C_1 - C_4 alkoxy group, or a C_1 - C_4 alkyl group;

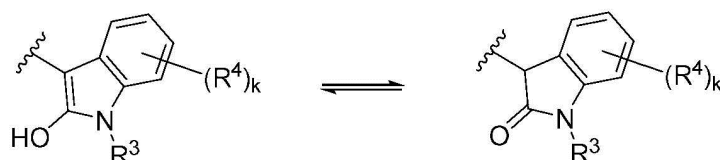
R^7 is a hydroxy C_1 - C_4 alkyl group, a C_1 - C_4 alkyl group, a C_2 - C_4 alkenyl group, a C_2 - C_4 alkynyl group, a C_3 - C_7 cycloalkyl group, or a C_3 - C_9 heterocycloalkyl group,

wherein the C_3 - C_7 cycloalkyl group or the C_3 - C_9 heterocycloalkyl is unsubstituted or substituted with a halogen, a C_1 - C_4 alkyl group, or a halo C_1 - C_4 alkyl group; and

X is H or OH;

wherein, when X is OH, the compound represented by Formula 1 includes a tautomeric structure represented by Formula 2,

[Formula 2]



R^3 , R^4 , and k in Formula 2 are the same as described in connection with Formula 1;

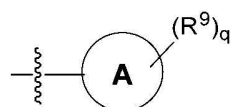
Y is $-(CH_2)_m-$, $-(CH_2)_m-O-(CH_2)_n-$, $-(CH_2)_m-CO-(CH_2)_n-$, $-(CH_2)_m-NR^8-(CH_2)_n-$, or $-(CH_2)_m-SO_2-(CH_2)_n-$,

wherein R^8 is hydrogen or a C_1 - C_4 alkyl group,

m and n are each independently an integer from 0 to 2; and

Z is represented by Formula 3;

[Formula 3]



wherein, in Formula 3,

$\textcircled{A}$ is a C_3 - C_{10} cycloalkyl group or a C_2 - C_{11} heterocycloalkyl group;

R^9 is a halogen, a hydroxy group, a cyano group, a nitro group, an amino group, a thiol group, a formyl group, a halo C_1 - C_4 alkyl group, a C_1 - C_4 alkoxy group, a linear or branched hydroxy C_1 - C_4 alkyl group, a linear or branched C_1 - C_4 alkyl group, a C_2 - C_4 alkenyl group, a C_2 - C_4 alkynyl group, a C_3 -

C₁₀ cycloalkyl group, a C₂-C₉ heterocycloalkyl group, a hydroxy C₂-C₉ heterocycloalkyl group, a linear or branched hydroxy C₁-C₄ alkylcarbonyl group, -NR¹⁰R¹¹, -COR¹², -COOR¹², or -SO₂R¹³,

q is an integer from 0 to 5,

5 wherein, when $\textcircled{\text{A}}$ is piperazine or piperidine, q is not 0, and

wherein two or more R⁹ are connected or fused with $\textcircled{\text{A}}$ to form a 7- to 12-membered bicycloalkyl group, heterobicycloalkyl group, spirocycloalkyl group, or spiroheterocycloalkyl group;

10 R¹⁰ and R¹¹ are each independently hydrogen, a hydroxy C₁-C₄ alkyl group, a halo C₁-C₄ alkyl group, a C₁-C₄ alkyl group, a C₂-C₄ alkenyl group, or a C₂-C₄ alkynyl group;

R¹² is hydrogen, a hydroxy group, a hydroxy C₁-C₄ alkyl group, a halo C₁-C₄ alkyl group, a C₁-C₄ alkyl group, a C₂-C₄ alkenyl group, a C₂-C₄ alkynyl group, a C₃-C₁₀ cycloalkyl group, or a C₂-C₉ heterocycloalkyl group;

15 R¹³ is hydroxy, a halo C₁-C₄ alkyl group, a C₁-C₄ alkyl group, a C₂-C₄ alkenyl group, a C₂-C₄ alkynyl group, a C₃-C₁₀ cycloalkyl group, a C₂-C₉ heterocycloalkyl group, aryl group, or -NR_fR_g, and

R_f and R_g are each independently hydrogen or a C₁-C₄ alkyl group.

20 [Claim 2] The compound of claim 1, wherein R³ is hydrogen, a hydroxy group, or a C₁-C₄ alkyl group.

[Claim 3] The compound of claim 1, wherein R⁴ is hydrogen, a halogen, a hydroxy group, a cyano group, a nitro group, an amino group, a halo C₁-C₄ alkyl group, a C₁-C₄ alkoxy group, a hydroxy C₁-C₄ alkyl group, a C₁-C₄ alkyl group, a C₂-C₄ alkenyl group, or a C₂-C₄ alkynyl group.

25

[Claim 4] The compound of claim 1, wherein R⁵ and R⁶ are each independently hydrogen, a halogen, a hydroxy group, a cyano group, or a C₁-C₄ alkyl group.

30

[Claim 5] The compound of claim 1, wherein R^7 is a C_3 - C_7 cycloalkyl group.

[Claim 6] The compound of claim 5, wherein R^7 is cyclopropyl.

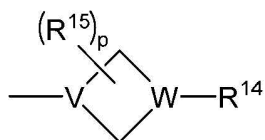
5

[Claim 7] The compound of claim 1, wherein Y is $-(CH_2)_m-$, wherein m is an integer selected from 1 and 2.

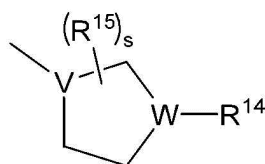
[Claim 8] The compound of claim 1, wherein R^{12} is hydrogen, a hydroxy C_1 - C_4 alkyl group, a halo C_1 - C_4 alkyl group, a C_1 - C_4 -alkyl group, a C_2 - C_4 alkenyl group, or a C_2 - C_4 alkynyl group; and R^{13} is hydroxy, a halo C_1 - C_4 alkyl group, a C_1 - C_4 alkyl group, a C_2 - C_4 alkenyl group, or a C_2 - C_4 alkynyl group.

[Claim 9] The compound of claim 1, wherein Z is any one selected from
15 Formula 11 to Formula 13:

[Formula 11]

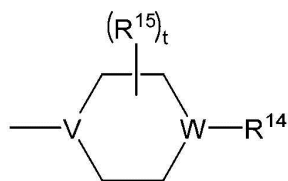


[Formula 12]



20

[Formula 13]



wherein, in Formulae 11 to 13,

V and W are each independently N or CH, provided that each of V and W is not CH at the same time,

R¹⁴ is hydrogen, a halogen, a linear or branched C₁-C₄ alkyl group, a linear or branched hydroxy C₁-C₄ alkyl, a hydroxy group, -NR¹⁶R¹⁷, a linear or branched hydroxy C₁-C₄ alkylcarbonyl group, a C₂-C₉ heterocycloalkyl group, a hydroxy C₂-C₉ heterocycloalkyl group, a linear or branched halo C₁-C₄ alkyl group, or a linear or branched C₁-C₄ alkoxy group,

each R¹⁵ is independently a linear or branched C₁-C₄ alkyl group, a linear or branched hydroxy C₁-C₄ alkyl group, or a halogen,

R¹⁴ and R¹⁵ are connected to each other, or R¹⁴ or R¹⁵ is fused with the cyclic compound represented by one of Formulae 11 to 13 to form a 7- to 12-membered bicycloalkyl group, heterobicycloalkyl group, spirocycloalkyl group, or spiroheterocycloalkyl group,

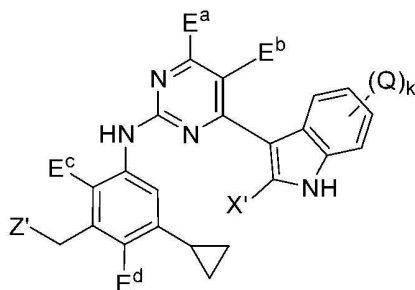
R¹⁶ and R¹⁷ are each independently hydrogen, a linear or branched C₁-C₄ alkyl group, or a linear or branched hydroxy C₁-C₄ alkyl group,

p is an integer from 0 to 4; and

s and t are each independently an integer from 0 to 5 when R¹⁴ is hydrogen, and an integer from 0 to 4 when R¹⁴ is not hydrogen.

[Claim 10] A compound selected from a compound represented by Formula 14, and a stereoisomer, tautomer, solvate, or pharmaceutically acceptable salt thereof.

[Formula 14]



wherein, in Formula 14,

E^a is hydrogen, a hydroxy, or a C₁-C₄ alkoxy group;

E^b is hydrogen, a halogen, a C_1 - C_4 alkyl group, or a C_1 - C_4 fluoroalkyl group;

E^c and E^d are each independently hydrogen or a hydroxy group;

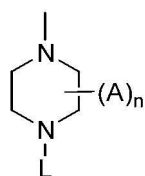
X' is hydrogen or a hydroxy group;

5 k is an integer from 0 to 4;

each Q is independently hydroxy, a halogen, a C_1 - C_4 alkyl group, a hydroxy C_1 - C_4 alkyl group, or a C_1 - C_4 alkoxy group; and

Z' is a monovalent functional group represented by Formula 15;

[Formula 15]



10

wherein, in Formula 15, n is an integer from 1 to 8;

each A is independently a functional group selected from hydroxy, a C_1 - C_4 alkyl group, and a hydroxy C_1 - C_4 alkyl group, wherein when n is two or more, two of the two or more A may be linked to each other to form an alkylene bridge to form Z' that is a 7- to 12-membered bridged heterobicycloalkyl ring, or two A may be spiro-connected to form a 7- to 12-membered spiroheterocycloalkyl ring; and

L is hydrogen, a C_1 - C_4 alkyl, a hydroxy group, or a hydroxy C_1 - C_4 alkyl group.

20

[Claim 11] The compound of claim 10, wherein E^b is a halogen, n is 2, and A is methyl.

[Claim 12] The compound of claim 10, wherein Z' is 3,5-dimethylpiperazine-1-yl.

25

[Claim 13] The compound of claim 10, wherein E^b is chlorine or fluorine.

[Claim 14] The compound of claim 1, wherein the compound of Formula 1 is selected from compounds below:

- 1) 5-chloro-*N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(6-fluoro-1*H*-indole-3-yl)pyrimidine-2-amine;
- 5 2) 5-chloro-4-(6-chloro-1*H*-indole-3-yl)-*N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)pyrimidine-2-amine;
- 3) 2-((2*R*, 6*S*)-4-(3-((5-chloro-4-(6-fluoro-1*H*-indole-3-yl)pyrimidine-2-yl)amino)-5-cyclopropylbenzyl)-2,6-dimethylpiperazine-1-yl)ethane-1-ol;
- 4) 2-((2*R*, 6*S*)-4-(3-((5-chloro-4-(1*H*-indole-3-yl)pyrimidine-2-yl)amino)-5-cyclopropylbenzyl)-2,6-dimethylpiperazine-1-yl)ethane-1-ol;
- 10 5) 2-((2*R*, 6*S*)-4-(3-((5-chloro-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-yl)amino)-5-cyclopropylbenzyl)-2,6-dimethylpiperazine-1-yl)ethane-1-ol;
- 6) (*R*)-5-chloro-*N*-(3-cyclopropyl-5-((3-methylpiperazine-1-yl)methyl)phenyl)-4-(1*H*-indole-3-yl)pyrimidine-2-amine;
- 15 7) (*R*)-5-chloro-*N*-(3-cyclopropyl-5-((3-methylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 8) 5-chloro-*N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 9) 5-chloro-*N*-(3-cyclopropyl-5-(((3*S*, 5*R*)-3-ethyl-5-methylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 20 10) 5-chloro-*N*-(3-cyclopropyl-5-(((3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 11) *N*-(3-cyclopropyl-5-(((3*R*,5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 25 12) *N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-5-fluoro-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 13) *N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(1*H*-indole-3-yl)-5-methylpyrimidine-2-amine;
- 14) *N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-5-methyl-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 30

- 15) *N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)-5-(trifluoromethyl)pyrimidine-2-amine;
- 16) (3-(5-chloro-2-((3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)amino)pyrimidine-4-yl)-1*H*-indole-6-yl)methanol;
- 17) 5-chloro-*N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(5-methoxy-6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 18) 3-(5-chloro-2-((3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)amino)pyrimidine-4-yl)-6-methyl-1*H*-indole-5-ol;
- 19) 3-(5-chloro-2-((3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)amino)pyrimidine-4-yl)-6-methylindoline-2-one;
- 20) 5-chloro-*N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-methoxy-6-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 21) 5-chloro-2-((3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)amino)-6-(6-methyl-1*H*-indole-3-yl)pyrimidine-4-ol;
- 22) 3-(5-chloro-2-((3-cyclopropyl-5-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)amino)pyrimidine-4-yl)-6-methyl-1*H*-indole-7-ol;
- 23) 2-((5-chloro-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-yl)amino)-4-cyclopropyl-6-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenol;
- 24) 4-((5-chloro-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-yl)amino)-2-cyclopropyl-6-(((3*R*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenol;
- 25) (*R*)-5-chloro-*N*-(3-cyclopropyl-5-((3,3,5-trimethylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 26) ((2*R*, 6*R*)-4-(3-((5-chloro-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-yl)amino)-5-cyclopropylbenzyl)-6-methylpiperazine-2-yl)methanol;
- 27) (*R*)-5-chloro-*N*-(3-cyclopropyl-5-((5-methyl-4,7-diazaspiro[2.5]octan-7-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;
- 28) 5-chloro-*N*-(3-cyclopropyl-5-(((3*R*, 5*R*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;

29) 5-chloro-*N*-(3-cyclopropyl-5-(((3*S*, 5*S*)-3,5-dimethylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;

30) 5-chloro-*N*-(3-cyclopropyl-5-(((3*R*, 5*S*)-3,4,5-trimethylpiperazine-1-yl)methyl)phenyl)-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-amine;

5 31) (2*R*, 6*S*)-4-(3-((5-chloro-4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-yl)amino)-5-cyclopropylbenzyl)-2,6-dimethylpiperazine-1-ol; and

32) (2*R*, 6*S*)-4-(3-cyclopropyl-5-((4-(6-methyl-1*H*-indole-3-yl)pyrimidine-2-yl)amino)benzyl)-2,6-dimethylpiperazine-1-ol.

10 [Claim 15] A pharmaceutical composition for the prevention or treatment of cancer, the composition comprising the compound of any one of claims 1-14 or a pharmaceutically acceptable salt thereof as an active ingredient.

15 [Claim 16] The pharmaceutical composition of claim 15, wherein the cancer comprises leukemia.

[Claim 17] The pharmaceutical composition of claim 16, wherein the leukemia comprises acute myelogenous leukemia, acute lymphocytic leukemia, or chronic myelogenous leukemia.

20

[Claim 18] A pharmaceutical composition for inhibiting FLT3 kinase activity, the pharmaceutical composition comprising: the compound of any one of claims 1 to 14 or a pharmaceutically acceptable salt thereof; and a pharmacologically acceptable excipient.