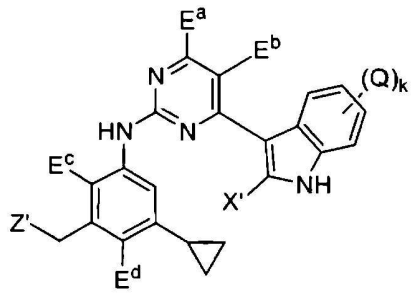
CLAIMS

1. A pharmaceutical composition for treating acute myeloid leukemia (AML), the pharmaceutical composition comprising a compound selected from Chemical Formula 1, a stereoisomer thereof, a tautomer thereof, and a combination thereof, or a pharmaceutically acceptable salt or solvate thereof,

administered in combination with a hypomethylating agent (HMA) or a pharmaceutically acceptable salt or solvate thereof,

wherein:

[Chemical Formula 1]



in Chemical Formula 1,

E^a is hydrogen, hydroxy, or C_{1-4} alkoxy;

E^b is hydrogen, halogen, C_{1-4} alkyl, or C_{1-4} fluoroalkyl;

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

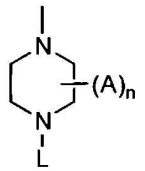
X' is hydrogen or hydroxy;

k is an integer of 1 to 2;

respective Q's are each independently hydroxy, halogen, C_{1-4} alkyl, hydroxy C_{1-4} alkyl, or C_{1-4} alkoxy; and

Z' is a monovalent functional group represented by Chemical Formula 2;

[Chemical Formula 2]



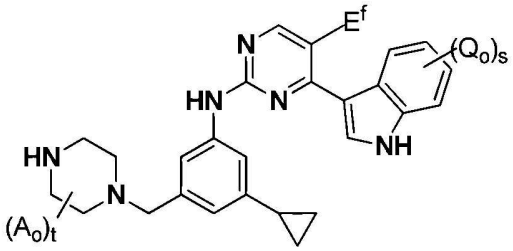
in Chemical Formula 2, n is an integer of 1 to 2;

respective A's are each independently a functional group selected from hydroxy, C_{1-4} alkyl, and hydroxy C_{1-4} alkyl, wherein at least one A is C_{1-4} alkyl; and

L is hydrogen, C_{1-4} alkyl, hydroxy, or hydroxy C_{1-4} alkyl.

2. The pharmaceutical composition of claim 1, wherein the compound of Chemical Formula 1 is selected from a compound of the following Chemical Formula 3, a stereoisomer thereof, a tautomer thereof, and a combination thereof:

[Chemical Formula 3]



in Chemical Formula 3,

E^f is fluorine, chlorine, bromine, or iodine;

Q_o is hydroxy, halogen, C_{1-4} alkyl, hydroxy C_{1-4} alkyl, or C_{1-4} alkoxy;

s is an integer of 1 to 2;

A_o is a functional group selected from hydroxy, C_{1-4} alkyl, and hydroxy C_{1-4} alkyl; and t is an integer of 1 to 2.

3. The pharmaceutical composition of claim 2, wherein the compound of Chemical Formula 1 is 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine, or a pharmaceutically acceptable salt or hydrate thereof.

4. The pharmaceutical composition of claim 1, wherein the HMA is any one selected from 4-amino-1-β-D-ribofuranosyl-1,3,5-triazin-2(1H)-one, 4-

amino-1-((2R,4R,5R)-4-hydroxy-5-(hydroxymethyl)tetrahydrofuran-2-yl)-1,3,5-triazin-2(1H)-one, and a pharmaceutically acceptable salt or hydrate thereof.

5. The pharmaceutical composition of claim 4, wherein the HMA is any one selected from 4-amino-1-β-D-ribofuranosyl-1,3,5-triazin-2(1H)-one, 4-amino-1-((2R,4R,5R)-4-hydroxy-5-(hydroxymethyl)tetrahydrofuran-2-yl)-1,3,5-triazin-2(1H)-one, and a pharmaceutically acceptable salt or hydrate thereof, and

a compound of Chemical Formula 1, a stereoisomer thereof, and a tautomer thereof.

6. The pharmaceutical composition of claim 5, wherein the HMA is 4-amino-1-β-D-ribofuranosyl-1,3,5-triazin-2(1H)-one, or 4-amino-1-((2R,4R,5R)-4-hydroxy-5-(hydroxymethyl)tetrahydrofuran-2-yl)-1,3,5-triazin-2(1H)-one or a pharmaceutically acceptable salt or hydrate thereof, and

the compound of Chemical Formula 1 is any one selected from a compound of Chemical Formula 3, a stereoisomer thereof, and a tautomer thereof.

7. The pharmaceutical composition of claim 6, wherein the HMA is 4-amino-1-β-D-ribofuranosyl-1,3,5-triazin-2(1H)-one, or 4-amino-1-((2R,4R,5R)-4-hydroxy-5-(hydroxymethyl)tetrahydrofuran-2-yl)-1,3,5-triazin-2(1H)-one, and

the compound of Chemical Formula 1 is 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine.

8. The pharmaceutical composition of claim 4, wherein the HMA is 4-amino-1-β-D-ribofuranosyl-1,3,5-triazin-2(1H)-one, and

a compound of Chemical Formula 1, a stereoisomer thereof, and a tautomer thereof.

9. The pharmaceutical composition of claim 5, wherein the HMA is 4-amino-1-β-D-ribofuranosyl-1,3,5-triazin-2(1H)-one, and

the compound of Chemical Formula 1 is any one selected from a compound of Chemical Formula 3, a stereoisomer thereof, and a tautomer thereof.

10. The pharmaceutical composition of claim 9, wherein the HMA is 4-amino-1-β-D-ribofuranosyl-1,3,5-triazin-2(1H)-one, and

the compound of Chemical Formula 1 is 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine.

11. The pharmaceutical composition of claim 4, wherein the HMA is 4-amino-1-((2R,4R,5R)-4-hydroxy-5-(hydroxymethyl)tetrahydrofuran-2-yl)-1,3,5-triazin-2(1H)-one, and

a compound of Chemical Formula 1, a stereoisomer thereof, and a tautomer thereof.

12. The pharmaceutical composition of claim 4, wherein the HMA is 4-amino-1-((2R,4R,5R)-4-hydroxy-5-(hydroxymethyl)tetrahydrofuran-2-yl)-1,3,5-triazin-2(1H)-one, and

the compound of Chemical Formula 1 is any one selected from a compound of Chemical Formula 3, a stereoisomer thereof, and a tautomer thereof.

13. The pharmaceutical composition of claim 12, wherein the HMA is 4-amino-1-((2R,4R,5R)-4-hydroxy-5-(hydroxymethyl)tetrahydrofuran-2-yl)-1,3,5-triazin-2(1H)-one, and

the compound of Chemical Formula 1 is 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine.

14. The pharmaceutical composition of claim 1 or 13, wherein the AML is AML with FLT3 mutations.

15. The pharmaceutical composition of claim 1 or 13, wherein the AML is mutant FLT3 polynucleotide-positive AML, FLT3 internal tandem duplication (ITD)-positive AML, or AML with FLT3 point mutations.

16. The pharmaceutical composition of claim 1, wherein the AML has a mutation in a tyrosine kinase domain (TKD) of an FLT3 amino acid sequence (FLT3-TKD).

17. The pharmaceutical composition of claim 16, wherein the FLT3-TKD mutation further comprises an internal tandem duplication (ITD).

18. The pharmaceutical composition of claim 16, wherein the FLT3-TKD mutation comprises any mutation selected from FLT3(D835Y), FLT3(F691L), FLT3(F691L/D835Y), FLT3(ITD/D835Y), FLT3(ITD/F691L), and a combination thereof.

19. The pharmaceutical composition of any one of claims 16 to 18, wherein the compound of Chemical Formula 1 is 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine, or a pharmaceutically acceptable salt or hydrate thereof.

20. The pharmaceutical composition of claims 1 or 13, wherein the compound of Chemical Formula 1 or a pharmaceutically acceptable salt or solvate thereof is administered with the HMA or a pharmaceutically acceptable salt or solvate thereof simultaneously, sequentially, in reverse order, or individually.

21. The pharmaceutical composition of claims 1 or 13, comprising the compound of Chemical Formula 1 or a pharmaceutically acceptable salt or solvate thereof and the HMA or a pharmaceutically acceptable salt or solvate thereof in a therapeutically effective amount, respectively.

22. A pharmaceutical composition for treating acute myeloid leukemia (AML), the pharmaceutical composition comprising a hypomethylating agent (HMA) or a pharmaceutically acceptable salt or solvate thereof,

administered in combination with a compound of Chemical Formula 1 or a pharmaceutically acceptable salt or solvate thereof.

23. The pharmaceutical composition of claim 1, wherein the compound of Chemical Formula 1 is any one selected from the group consisting of the following compounds:

1) 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-fluoro-1H-indol-3-yl)pyrimidin-2-amine,

2) 5-chloro-4-(6-chloro-1H-indol-3-yl)-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)pyrimidin-2-amine,

3) 2-((2R, 6S)-4-(3-((5-chloro-4-(6-fluoro-1H-indol-3-yl)pyrimidin-2-yl)amino)-5-cyclopropylbenzyl)-2,6-dimethylpiperazin-1-yl)ethan-1-ol,

4) 2-((2R, 6S)-4-(3-((5-chloro-4-(1H-indol-3-yl)pyrimidin-2-yl)amino)-5-cyclopropylbenzyl)-2,6-dimethylpiperazin-1-yl)ethan-1-ol,

5) 2-((2R, 6S)-4-(3-((5-chloro-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-yl)amino)-5-cyclopropylbenzyl)-2,6-dimethylpiperazin-1-yl)ethan-1-ol,

6) (R)-5-chloro-N-(3-cyclopropyl-5-((3-methylpiperazin-1-yl)methyl)phenyl)-4-(1H-indol-3-yl)pyrimidin-2-amine,

7) (R)-5-chloro-N-(3-cyclopropyl-5-((3-methylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

8) 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

9) 5-chloro-N-(3-cyclopropyl-5-(((3S, 5R)-3-ethyl-5-methylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

10) 5-chloro-N-(3-cyclopropyl-5-((3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

11) N-(3-cyclopropyl-5-(((3R,5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

12) N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-5-fluoro-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

13) N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(1H-indol-3-yl)-5-methylpyrimidin-2-amine,

14) N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-5-methyl-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

15) N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)-5-(trifluoromethyl)pyrimidin-2-amine,

16) (3-(5-chloro-2-((3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)amino)pyrimidin-4-yl)-1H-indol-6-yl)methanol,

17) 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(5-methoxy-6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

18) 3-(5-chloro-2-((3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)amino)pyrimidin-4-yl)-6-methyl-1H-indol-5-ol,

19) 3-(5-chloro-2-((3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)amino)pyrimidin-4-yl)-6-methylindolin-2-one,

20) 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-methoxy-6-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

21) 5-chloro-2-((3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)amino)-6-(6-methyl-1H-indol-3-yl)pyrimidin-4-ol,

22) 3-(5-chloro-2-((3-cyclopropyl-5-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)amino)pyrimidin-4-yl)-6-methyl-1H-indol-7-ol,

23) 2-((5-chloro-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-yl)amino)-4-cyclopropyl-6-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenol,

24) 4-((5-chloro-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-yl)amino)-2-cyclopropyl-6-(((3R, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenol,

25) (R)-5-chloro-N-(3-cyclopropyl-5-((3,3,5-trimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

26) ((2R, 6R)-4-(3-((5-chloro-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-yl)amino)-5-cyclopropylbenzyl)-6-methylpiperazin-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-1H-indol-3-yl)pyrimidin-2-amine,

28) 5-chloro-N-(3-cyclopropyl-5-(((3R, 5R)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

29) 5-chloro-N-(3-cyclopropyl-5-(((3S, 5S)-3,5-dimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

30) 5-chloro-N-(3-cyclopropyl-5-(((3R, 5S)-3,4,5-trimethylpiperazin-1-yl)methyl)phenyl)-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-amine,

31) (2R, 6S)-4-(3-((5-chloro-4-(6-methyl-1H-indol-3-yl)pyrimidin-2-yl)amino)-5-cyclopropylbenzyl)-2,6-dimethylpiperazin-1-ol, and

32) (2R, 6S)-4-(3-cyclopropyl-5-((4-(6-methyl-1H-indol-3-yl)pyrimidin-2-yl)amino)benzyl)-2,6-dimethylpiperazin-1-ol.