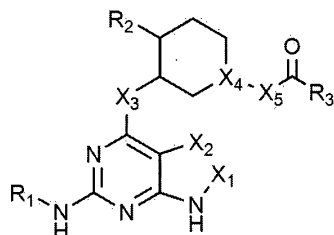


WHAT IS CLAIMED IS:

1. A compound represented by the following Chemical Formula 1, or a pharmaceutically acceptable salt thereof:

5 [Chemical Formula 1]



in Chemical Formula 1,

R₁ is C₆₋₁₀ aryl; or C₂₋₁₀ heteroaryl containing one to three of N, O, or S;

wherein R₁ is unsubstituted, or substituted with a substituent selected from the group consisting of piperazinyl unsubstituted or substituted with C₁₋₄ alkyl; benzyl unsubstituted or substituted with C₁₋₄ alkoxy; one or two C₁₋₄ alkyl unsubstituted or substituted with morpholino, -N(C₁₋₄ alkyl)₂, C₁₋₄ alkoxy, cyano, or -CONH(C₁₋₄ alkyl); C₁₋₄ haloalkyl; C₃₋₆ cycloalkyl; morpholino; -CO-(morpholino); morpholino and halogen; -N(C₁₋₄ alkyl)₂; -NHCO(C₂₋₄ alkenyl); -NHCO(pyrrolidinyl); C₁₋₄ alkoxy unsubstituted or substituted with -N(C₁₋₄ alkyl)₂; C₆₋₁₀ aryloxy; pyrazolyl unsubstituted or substituted with one or two C₁₋₄ alkyl; pyrrolidinyl; tetrahydropyranyl; and halogen,

R₂ is hydrogen, C₁₋₄ alkyl, or halogen;

R₃ is C₁₋₄ alkyl unsubstituted or substituted with cyano, or halogen; C₂₋₆ alkenyl unsubstituted or substituted with one or two substituents independently selected from the group consisting of cyano, C₃₋₆ cycloalkyl, and -N(C₁₋₄ alkyl)₂; or C₂₋₄ alkynyl unsubstituted or substituted with C₃₋₆ cycloalkyl,

X₁ is CR₄ or N,

wherein R₄ is hydrogen, C₁₋₄ alkyl, or halogen,

X₂ is CR₅, or N,

wherein R₅ is hydrogen, C₁₋₄ alkyl, C₁₋₄ alkoxy, C₁₋₄ haloalkyl, halogen, cyano, or C₁₋₄ alkylthio,

X_3 is NR_6 , O, or S,

wherein R_6 is hydrogen or C_{1-4} alkyl,

X_4 is CH, or N, and

X_5 is a bond, or NH.

5

2. The compound or a pharmaceutically acceptable salt thereof according to claim 1, wherein R_1 is benzothiazolyl, isothiazolyl, isoxazolyl, phenyl, pyrazolyl, or pyridinyl.

3. The compound or a pharmaceutically acceptable salt thereof according to claim 1, wherein R_1 is

10 unsubstituted benzothiazolyl;
isothiazolyl substituted by C_{1-4} alkyl;
isoxazolyl unsubstituted or substituted by C_{1-4} alkyl;
pyrazolyl substituted by benzyl substituted by C_{1-4} alkoxy, one or two C_{1-4} alkyl

15 unsubstituted or substituted by morpholino, $-N(C_{1-4} \text{ alkyl})_2$, C_{1-4} alkoxy, cyano, or $-CONH(C_{1-4} \text{ alkyl})$, C_{1-4} haloalkyl, C_{3-6} cycloalkyl, or tetrahydropyranyl;
phenyl substituted by piperazinyl substituted by C_{1-4} alkyl, morpholino, $-CO-$ (morpholino), morpholino and halogen, $-N(C_{1-4} \text{ alkyl})_2$, $-NHCO(C_{2-4} \text{ alkenyl})$, $-NHCO(\text{pyrrolidinyl})$, C_{1-4} alkoxy substituted by $-N(C_{1-4} \text{ alkyl})_2$, phenoxy, pyrazolyl

20 unsubstituted or substituted by one or two C_{1-4} alkyl, or pyrrolidinyl; or
unsubstituted pyridinyl.

4. The compound or a pharmaceutically acceptable salt thereof according to claim 1, wherein R_2 is hydrogen, methyl, or fluoro.

25

5. The compound or a pharmaceutically acceptable salt thereof according to claim 1, wherein R_3 is $-CH_2Cl$, $-CH_2CN$, $-CH=CH_2$, $-CH=CHCH_3$, $-C(CN)=CHCH(CH_3)_2$, $-C(CN)=CH(\text{cyclopentyl})$, $-C(CN)=CH(\text{cyclopropyl})$, $-C(CN)=CHC(CH_3)_3$, $-C(CN)=CHCH(CH_3)_2$, $-C\equiv CCH_3$, $-C\equiv CCH_2CH_3$, or $-C\equiv C-(\text{cyclopropyl})$.

30

6. The compound or a pharmaceutically acceptable salt thereof according to claim 1,
wherein X_1 is CH, or N.

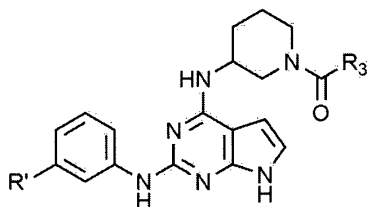
7. The compound or a pharmaceutically acceptable salt thereof according to claim 1,
5 wherein X_2 is CR_5 , and R_5 is hydrogen, methyl, fluoro, chloro, cyano, or methylthio.

8. The compound or a pharmaceutically acceptable salt thereof according to claim 1,
wherein X_3 is NH, $N(CH_3)$, S, or O.

9. The compound or a pharmaceutically acceptable salt thereof according to claim 1,
10 wherein X_4 is N, and X_5 is a bond, or
 X_4 is CH, and X_5 is NH.

10. The compound or a pharmaceutically acceptable salt thereof according to claim 1,
15 wherein the compound represented by Chemical Formula 1 is represented by the following
Chemical Formula 1-1:

[Chemical Formula 1-1]



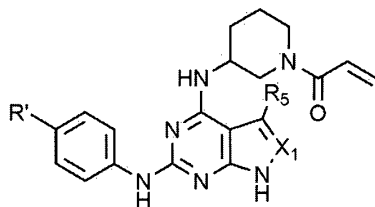
in Chemical Formula 1-1,

20 R' is $-NHCO(C_{2-4} \text{ alkenyl})$; $-NHCO(\text{pyrrolidinyl})$; or pyrazolyl unsubstituted or
substituted with two C_{1-4} alkyl,

R_3 is C_{1-4} alkyl unsubstituted or substituted with cyano; or C_{2-4} alkenyl unsubstituted or
substituted with cyano or $-N(C_{1-4} \text{ alkyl})$.

11. The compound or a pharmaceutically acceptable salt thereof according to claim 1,
25 wherein the compound represented by Chemical Formula 1 is represented by the following
Chemical Formula 1-2:

[Chemical Formula 1-2]



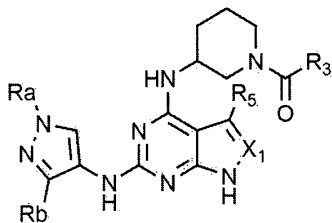
in Chemical Formula 1-2,

X₁ is CH, or N,

- 5 R' is piperazinyl unsubstituted or substituted with C₁₋₄ alkyl; morpholino; -CO-(morpholino); -N(C₁₋₄ alkyl)₂; C₁₋₄ alkoxy unsubstituted or substituted with -N(C₁₋₄ alkyl)₂; phenoxy; pyrazolyl unsubstituted or substituted with one or two C₁₋₄ alkyl; or pyrrolidinyl, and
 R₅ is hydrogen or halogen.

- 10 12. The compound or a pharmaceutically acceptable salt thereof according to claim 1, wherein the compound represented by Chemical Formula 1 is represented by the following Chemical Formula 1-3:

[Chemical Formula 1-3]



- 15 in Chemical Formula 1-3,

X₁ is CH, or N,

Ra is benzyl unsubstituted or substituted with C₁₋₄ alkoxy; C₁₋₄ alkyl unsubstituted or substituted with morpholino, -N(C₁₋₄ alkyl)₂, C₁₋₄ alkoxy, cyano, or -CONH(C₁₋₄ alkyl); C₁₋₄ haloalkyl; C₃₋₆ cycloalkyl; or tetrahydropyranyl,

- 20 Rb is hydrogen or C₁₋₄ alkyl,

R₃ is C₂₋₄ alkenyl unsubstituted or substituted with cyano or -N(C₁₋₄ alkyl)₂; or C₂₋₄ alkynyl, and

R₅ is hydrogen or halogen.

13. The compound or a pharmaceutically acceptable salt thereof according to claim 1 wherein the compound represented by Chemical Formula 1 is selected from the group consisting of:

- 1) (R)-1-(3-(2-(4-(4-methylpiperazin-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 2) (R)-N-(3-(4-(1-acryloylpiperidin-3-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-2-ylamino)phenyl)pyrrolidine-1-carboxamide,
- 3) (S)-N-(3-(4-(1-acryloylpiperidin-3-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-2-ylamino)phenyl)pyrrolidine-1-carboxamide,
- 4) (R)-1-(3-(2-(4-morpholinophenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 5) (R)-1-(3-(2-(4-(pyrrolidin-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 6) (R)-1-(3-(2-(4-(3,5-dimethyl-1H-pyrazol-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 7) (R)-1-(3-(2-(4-(2-(diethylamino)ethoxy)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 8) (R)-1-(3-(2-(4-(morpholine-4-carbonyl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 9) (R)-1-(3-(2-(4-(dimethylamino)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 10) (R)-1-(3-(2-(3-(3,5-dimethyl-1H-pyrazol-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 11) (S)-1-(3-(2-(4-(4-methylpiperazin-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 12) (R)-1-(3-(2-(benzo[d]thiazol-6-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 13) (R)-1-(3-(2-(4-phenoxyphenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 14) (R)-1-(3-(2-(1-methyl-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-

- ylamino)piperidin-1-yl)prop-2-en-1-one,
- 15) (R)-1-(3-(2-(1-(2,2-difluoroethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 16) (R)-1-(3-(2-(1-(difluoromethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 17) (R)-1-(3-(2-(1-(2-methoxyethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 18) (R)-1-(3-(2-(1-(2-morpholinoethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 19) (R)-1-(3-(2-(1-(2-(diethylamino)ethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 20) (R)-1-(3-(2-(1-(3-methoxybenzyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 21) (R)-1-(3-(2-(1-ethyl-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 22) (R)-1-(3-(2-(1,3-dimethyl-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 23) (R)-1-(3-(2-(isoxazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 24) (R)-2-(4-(4-(1-acryloylpiperidin-3-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-2-ylamino)-1H-pyrazol-1-yl)-N-methylacetamide,
- 25) (R)-1-(3-(2-(1-(2,2-difluoroethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)but-2-yn-1-one,
- 26) (R)-N-(3-(4-(1-(2-cyanoacetyl)piperidin-3-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-2-ylamino)phenyl)acrylamide,
- 27) 1-((3R,4R)-4-methyl-3-(methyl(2-(4-(4-methylpiperazin-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 28) 3-((3R,4R)-4-methyl-3-(methyl(2-(4-(4-methylpiperazin-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)-3-oxopropanenitrile,
- 29) N-(3-(2-(4-(4-methylpiperazin-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-

- 4-ylamino)cyclohexyl)acrylamide,
- 30) (R)-1-(3-(6-(4-(4-methylpiperazin-1-yl)phenylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 31) (R)-1-(3-(6-(1-(2,2-difluoroethyl)-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 32) (R)-1-(3-(6-(1-methyl-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 33) (R)-1-(3-(6-(1-ethyl-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 34) (R)-1-(3-(6-(1-(difluoromethyl)-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 35) (R)-2-(4-(4-(1-acryloylpiperidin-3-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-6-ylamino)-1H-pyrazol-1-yl)-N-methylacetamide,
- 36) (R)-1-(3-(5-chloro-2-(4-(4-methylpiperazin-1-yl)phenylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 37) (R)-1-(3-(5-chloro-2-(1-ethyl-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 38) (R)-1-(3-(5-chloro-2-(1-(difluoromethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 39) (R)-1-(3-(5-chloro-2-(1-(2,2-difluoroethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 40) (R)-1-(3-(5-chloro-2-(1-(2-morpholinoethyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 41) (R)-1-(3-(5-chloro-2-(1-(3-methoxybenzyl)-1H-pyrazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 42) (R)-1-(3-(3-chloro-6-(4-(4-methylpiperazin-1-yl)phenylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 43) (R)-1-(3-(3-chloro-6-(4-(3,5-dimethyl-1H-pyrazol-1-yl)phenylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 44) (R)-1-(3-(3-chloro-6-(1-(2,2-difluoroethyl)-1H-pyrazol-4-ylamino)-1H-

- pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 45) (R)-1-(3-(3-chloro-6-(1-methyl-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 46) (R)-1-(3-(3-chloro-6-(1-ethyl-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 5) 47) (R)-2-(4-(4-(1-acryloylpiperidin-3-ylamino)-3-chloro-1H-pyrazolo[3,4-d]pyrimidin-6-ylamino)-1H-pyrazol-1-yl)-N-methylacetamide,
- 48) (R)-1-(3-(3-chloro-6-(1-(tetrahydro-2H-pyran-4-yl)-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 10 49) (R)-1-(3-(3-chloro-6-(1-cyclopropyl-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 50) (R)-1-(3-(3-chloro-6-(1-isopropyl-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 51) (R)-1-(3-(3-chloro-6-(1-propyl-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 15 52) (R)-2-(4-(4-(1-acryloylpiperidin-3-ylamino)-3-chloro-1H-pyrazolo[3,4-d]pyrimidin-6-ylamino)-1H-pyrazol-1-yl)acetonitrile,
- 53) (R)-1-(3-(6-(1-*tert*-butyl-1H-pyrazol-4-ylamino)-3-chloro-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 20 54) (R)-1-(3-(3-chloro-6-(1-(2-morpholinoethyl)-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 55) (R)-1-(3-(3-chloro-6-(1-isobutyl-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 56) (R)-1-(3-(3-chloro-6-(1-(2,2,2-trifluoroethyl)-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 25 57) (R)-1-(3-(3-chloro-6-(1-(2-(diethylamino)ethyl)-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 58) (R)-1-(3-(3-chloro-6-(1-(3-methoxybenzyl)-1H-pyrazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-ylamino)piperidin-1-yl)prop-2-en-1-one,
- 30 59) (R)-1-(3-(3-chloro-6-(isoxazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-

- ylamino)piperidin-1-yl)prop-2-en-1-one,
- 60) (R)-2-(4-((4-((1-acryloylpiperidin-3-yl)amino)-5-chloro-7H-pyrrolo[2,3-d]pyrimidin-2-yl)amino)-1H-pyrazol-1-yl)-N-methylacetamide,
- 61) (R)-1-(3-((5-chloro-2-((4-morpholinophenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 5 d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 62) (R)-1-(3-((5-chloro-2-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 63) (R)-1-(3-((5-chloro-2-((1-isobutyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 10 64) (R)-1-(3-((3-chloro-6-((1-(difluoromethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 65) (R)-1-(3-((6-((1-isobutyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 66) (R)-1-(3-((6-((1-(*tert*-butyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 15 d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 67) (R)-1-(3-((6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 68) (R)-1-(3-((5-chloro-2-((4-(morpholine-4-carbonyl)phenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 20 69) (R)-1-(3-((5-chloro-2-((1-methyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 70) (R)-1-(3-((2-((1-(*tert*-butyl)-1H-pyrazol-4-yl)amino)-5-chloro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 71) (R)-1-(3-((6-((1-(tetrahydro-2H-pyran-4-yl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 25 pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 72) (R)-1-(3-((6-((1-(2-morpholinoethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 73) (R)-1-(3-((6-((1-propyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 30 74) (R)-1-(3-((6-((1-(2-methoxyethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-

- d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 75) (R)-1-(3-((2-((3-methylisothiazol-5-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 76) 1-((3S,4R)-3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)-4-fluoropiperidin-1-yl)prop-2-en-1-one,
- 5 d]pyrimidin-4-yl)amino)-4-fluoropiperidin-1-yl)prop-2-en-1-one,
- 77) 1-((3S,4R)-3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-fluoropiperidin-1-yl)prop-2-en-1-one,
- 78) (R)-1-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-5-fluoro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 10 79) (R,E)-3-cyclopropyl-2-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-5-fluoro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)acrylonitrile,
- 80) (R)-1-(3-((2-((4-(3,5-dimethyl-1H-pyrazol-1-yl)phenyl)amino)-5-methyl-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 81) (R)-1-(3-((2-(benzo[d]thiazol-6-ylamino)-5-methyl-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 15 d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 82) (R)-1-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-5-fluoro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 83) (R)-1-(3-((5-fluoro-2-((3-methylisothiazol-5-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 20 84) 1-((3R,4R)-3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-5-fluoro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 85) (R)-1-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-5-fluoro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 86) 1-((3S,4R)-3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-5-fluoro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)-4-fluoropiperidin-1-yl)prop-2-en-1-one,
- 25 d]pyrimidin-4-yl)amino)-4-fluoropiperidin-1-yl)prop-2-en-1-one,
- 87) (R,E)-3-cyclopropyl-2-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-5-fluoro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)acrylonitrile,
- 88) (R)-4-((1-acryloylpiperidin-3-yl)amino)-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidine-5-carbonitrile,
- 30 89) (R)-4-((1-acryloylpiperidin-3-yl)amino)-2-((1-cyclopropyl-1H-pyrazol-4-

- yl)amino)-7H-pyrrolo[2,3-d]pyrimidine-5-carbonitrile,
- 90) (R)-1-(3-((3-chloro-6-((1-(2,2-difluoroethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 91) (R)-1-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-
5 d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 92) 1-((3R,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 93) 1-((3R,4R)-3-((3-chloro-6-((1-(2,2-difluoroethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 10 94) 1-((3R,4R)-3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 95) (R)-1-(3-((5-chloro-2-((1-(2-(diethylamino)ethyl)-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 96) (R)-1-(3-((5-chloro-2-(isoxazol-4-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-
15 yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 97) (R)-1-(3-((5-chloro-2-((2-fluoro-4-morpholinophenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 98) (R)-1-(3-((5-chloro-2-((3-fluoro-4-morpholinophenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 20 99) (R)-1-(3-((5-chloro-2-((5-methylisoxazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 100) (R)-1-(3-((5-chloro-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)(methyl)amino)piperidin-1-yl)prop-2-en-1-one,
- 101) (R)-1-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-
25 yl)(methyl)amino)piperidin-1-yl)prop-2-en-1-one,
- 102) (R)-1-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)(methyl)amino)piperidin-1-yl)prop-2-en-1-one,
- 103) (R)-1-(3-((2-((1-(2,2-difluoroethyl)-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)(methyl)amino)piperidin-1-yl)prop-2-en-1-one,
- 30 104) (R)-1-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-

- yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 105) (R)-1-(3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 106) 1-((3R,4R)-3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-
5 d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 107) 1-((3R,4R)-3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-
d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 108) (R)-1-(3-((3-chloro-6-((1-(2,2-difluoroethyl)-1H-pyrazol-4-yl)amino)-1H-
pyrazolo[3,4-d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 109) (R)-1-(3-((5-chloro-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-
10 d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 110) (R)-1-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-
pyrazolo[3,4-d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 111) (R)-1-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-
15 d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 112) (R)-1-(3-((6-((1-(*tert*-butyl)-1H-pyrazol-4-yl)amino)-3-chloro-1H-
pyrazolo[3,4-d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 113) (R)-1-(3-((3-chloro-6-((1-isobutyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-
d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 114) (R)-1-(3-((3-chloro-6-((1-(2,2,2-trifluoroethyl)-1H-pyrazol-4-yl)amino)-1H-
20 pyrazolo[3,4-d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 115) (R)-1-(3-((3-chloro-6-((1-propyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-
d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 116) (R)-1-(3-((3-chloro-6-(isoxazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-
25 yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 117) (R)-1-(3-((3-chloro-6-(isoxazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-
yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 118) (R)-1-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-
d]pyrimidin-4-yl)(methyl)amino)piperidin-1-yl)prop-2-en-1-one,
- 119) (R)-1-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-
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- d]pyrimidin-4-yl)(methylamino)piperidin-1-yl)prop-2-en-1-one,
- 120) 1-((3R,4R)-3-((3-chloro-6-((1-(2,2,2-trifluoroethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 121) 1-((3R,4R)-3-((3-chloro-6-((1-propyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 5 122) 1-((3R,4R)-3-((3-chloro-6-((1-(2-(diethylamino)ethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 123) 1-((3R,4R)-3-((3-chloro-6-((1-(2-morpholinoethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 10 124) 1-((3R,4R)-3-((3-chloro-6-((1-isobutyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 125) 1-((3R,4R)-3-((3-chloro-6-((1-(3-methoxybenzyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 126) 2-(4-(((3R,4R)-1-acryloyl-4-methylpiperidin-3-yl)amino)-3-chloro-1H-pyrazolo[3,4-d]pyrimidin-6-yl)amino)-1H-pyrazol-1-yl)acetonitrile,
- 15 127) 1-((3R,4R)-3-((3-chloro-6-((1-(difluoromethyl)-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 128) 1-((3R,4R)-3-((3-chloro-6-((1-methyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 20 129) (R)-1-(3-((6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 130) (R)-1-(3-((6-(isoxazol-4-ylamino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 131) (R)-1-(3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)(methylamino)piperidin-1-yl)prop-2-en-1-one,
- 25 132) 1-((3R,4R)-3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 133) 1-((3R,4R)-3-((6-((1-(2,2-difluoroethyl)-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 30 one,

- 134) 2-(4-(((3R,4R)-1-acryloyl-4-methylpiperidin-3-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-6-yl)amino)-1H-pyrazol-1-yl)acetonitrile,
- 135) 1-((3R,4R)-3-((6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 5 136) (R)-1-(3-((5-chloro-2-((3-methylisothiazol-5-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 137) (R)-1-(3-((5-chloro-2-(pyridin-3-ylamino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 138) 3-((3S,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-fluoropiperidin-1-yl)-3-oxopropanenitrile,
- 10 d]pyrimidin-4-yl)amino)-4-fluoropiperidin-1-yl)-3-oxopropanenitrile,
- 139) (R)-3-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)-3-oxopropanenitrile,
- 140) (R,E)-1-(3-((5-chloro-2-((4-(4-methylpiperazin-1-yl)phenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)but-2-en-1-one,
- 15 141) 1-((R)-3-((5-chloro-2-((4-(4-methylpiperazin-1-yl)phenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)-3-cyclopropylprop-2-yn-1-ol,
- 142) 1-((R)-3-((5-chloro-2-((4-(4-methylpiperazin-1-yl)phenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)pent-2-yn-1-ol,
- 143) 1-((R)-3-((5-chloro-2-((4-(4-methylpiperazin-1-yl)phenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidin-1-yl)but-2-yn-1-ol,
- 20 144) (R)-1-(3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)thio)piperidin-1-yl)prop-2-en-1-one,
- 145) 1-((3R,4R)-3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 25 146) (R)-1-(3-((6-(isoxazol-4-ylamino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 147) (R)-1-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)oxy)piperidin-1-yl)prop-2-en-1-one,
- 148) (R)-4-((1-acryloylpiperidin-3-yl)oxy)-2-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidine-5-carbonitrile,
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- 149) (R)-4-((1-acryloylpiperidin-3-yl)oxy)-2-((1-(2,2-difluoroethyl)-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidine-5-carbonitrile,
- 150) (R)-4-((1-acryloylpiperidin-3-yl)oxy)-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidine-5-carbonitrile,
- 5 151) (R)-1-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)oxy)piperidin-1-yl)prop-2-en-1-one,
- 152) (R)-1-(3-((2-((4-morpholinophenyl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)oxy)piperidin-1-yl)prop-2-en-1-one,
- 153) (R)-1-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)oxy)piperidin-1-yl)prop-2-en-1-one,
- 10 154) (R,E)-2-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)oxy)piperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 155) (R,E)-2-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)oxy)piperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 15 156) (R,E)-4-((1-(2-cyano-4-methylpent-2-enoyl)piperidin-3-yl)oxy)-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidine-5-carbonitrile,
- 157) (R,E)-4-((1-(2-cyano-3-cyclopropylacryloyl)piperidin-3-yl)oxy)-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidine-5-carbonitrile,
- 158) (R,E)-2-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)oxy)piperidine-1-carbonyl)-4-methylpent-2-enenitrile,
- 20 159) 1-((3R,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)(methyl)amino)-4-methylpiperidin-1-yl)prop-2-en-1-one,
- 160) (E)-2-((3S,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-fluoropiperidine-1-carbonyl)-4-methylpent-2-enenitrile,
- 25 161) (E)-2-((3S,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-fluoropiperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 162) (R,E)-2-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)-4-methylpent-2-enenitrile,
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- 163) (R,E)-2-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)-4,4-dimethylpent-2-enenitrile,
- 164) (R,E)-2-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 5 165) (R,E)-2-(3-((3-chloro-6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)-3-cyclopentylacrylonitrile,
- 166) (R,E)-2-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 167) (R,E)-2-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)(methyl)amino)piperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 10 168) (R,E)-2-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)(methyl)amino)piperidine-1-carbonyl)-4-methylpent-2-enenitrile,
- 169) (E)-2-((3R,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidine-1-carbonyl)-3-
- 15 cyclopropylacrylonitrile,
- 170) (E)-2-((3R,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidine-1-carbonyl)-4-methylpent-2-enenitrile,
- 171) (R,E)-3-cyclopropyl-2-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)acrylonitrile,
- 20 172) (R,E)-2-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)-4-methylpent-2-enenitrile,
- 173) (R,E)-3-cyclopropyl-2-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)thio)piperidine-1-carbonyl)acrylonitrile,
- 25 174) (R,E)-2-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)thio)piperidine-1-carbonyl)-4-methylpent-2-enenitrile,
- 175) (R,E)-3-cyclopropyl-2-(3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)acrylonitrile,
- 176) (R,E)-3-cyclopropyl-2-(3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)thio)piperidine-1-carbonyl)acrylonitrile,
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- 177) (R,E)-2-(3-((5-chloro-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 178) (R,E)-2-(3-((5-chloro-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)-4-methylpent-2-enenitrile,
- 5 179) (R,E)-2-(3-((5-chloro-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)thio)piperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 180) (R,E)-2-(3-((5-chloro-2-((1-ethyl-1H-pyrazol-4-yl)amino)-7H-pyrrolo[2,3-d]pyrimidin-4-yl)thio)piperidine-1-carbonyl)-4-methylpent-2-enenitrile,
- 181) (R,E)-2-(3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-
10 d]pyrimidin-4-yl)thio)piperidine-1-carbonyl)-3-cyclopropylacrylonitrile,
- 182) (R,E)-3-cyclopropyl-2-(3-((2-((1-ethyl-1H-pyrazol-4-yl)amino)-5-fluoro-7H-pyrrolo[2,3-d]pyrimidin-4-yl)amino)piperidine-1-carbonyl)acrylonitrile,
- 183) 2-chloro-1-((3R,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-methylpiperidin-1-yl)ethan-1-one,
- 15 184) (R)-1-(3-((6-((1-(2,2-difluoroethyl)-1H-pyrazol-4-yl)amino)-3-methyl-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 185) (R)-1-(3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-3-methyl-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 186) (R)-1-(3-((6-((1-isobutyl-1H-pyrazol-4-yl)amino)-3-methyl-1H-pyrazolo[3,4-
20 d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 187) (R)-1-(3-((6-((1-(*tert*-butyl)-1H-pyrazol-4-yl)amino)-3-methyl-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 188) (R)-1-(3-((6-((1-cyclopropyl-1H-pyrazol-4-yl)amino)-3-methyl-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 25 189) (R)-1-(3-((6-((1-ethyl-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 190) (R)-1-(3-((6-((1-(2,2-difluoroethyl)-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,
- 191) (R)-1-(3-((6-((1-methyl-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-
30 pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one,

192) (R)-1-(3-((6-((1-(*tert*-butyl)-1H-pyrazol-4-yl)amino)-3-(methylthio)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)piperidin-1-yl)prop-2-en-1-one, and

193) 1-((3S,4R)-3-((3-chloro-6-((1-ethyl-1H-pyrazol-4-yl)amino)-1H-pyrazolo[3,4-d]pyrimidin-4-yl)amino)-4-fluoropiperidin-1-yl)prop-2-en-1-one.

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14. A pharmaceutical composition for the prevention or treatment of inflammatory disease, autoimmune disease, proliferative disease, hyperproliferative disease, immunity mediated disease, cancer or tumor, comprising the compound according to any one of claims 1 to 13 or a pharmaceutically acceptable salt thereof.

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