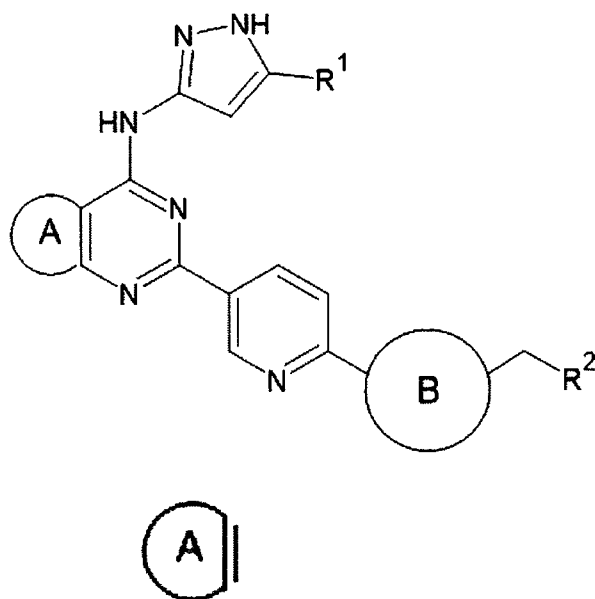


【CLAIMS】

【Claim 1】

A compound of the following Chemical Formula 1, an stereoisomer thereof, a solvate thereof, a hydrate thereof, or a pharmaceutically acceptable salt thereof:

5 [Chemical Formula 1]



wherein  is furan, thiophene, benzene, or cyclopentene,

R¹ is a straight or branched C₁-C₃ alkyl, wherein R¹ is unsubstituted or substituted with at least one halogen,

10 Ring B is diazabicycloheptane, piperazine, diazepane, or diazaspirooctane, wherein Ring B is unsubstituted or substituted with at least one straight or branched C₁-C₆ alkyl,

R² is pyridinyl, thiazolyl, phenyl, imidazolyl, pyrazinyl, quinolinyl, pyrimidinyl, or pyridonyl, wherein R² is unsubstituted or substituted with at least one

15 R³, and

R³ is at least one substituent selected from the group consisting of a straight or branched C₁-C₆ alkyl, a straight or branched C₁-C₆ haloalkyl, a straight or

branched C₁-C₆ alkoxy, a halogen, a C₁-C₃ alkanesulfonamido, an amino substituted with at least one straight or branched C₁-C₃ alkyl, and nitrile.

【Claim 2】

The compound, the stereoisomer thereof, the solvate thereof, the hydrate thereof, or the pharmaceutically acceptable salt thereof of claim 1, wherein Ring B is 3,6-diazabicyclo[3.1.1]heptane, 2,5-diazabicyclo[2.2.1]heptane, piperazine, diazepane or 4,7-diazaspiro[2,5]octane.

【Claim 3】

The compound, the stereoisomer thereof, the solvate thereof, the hydrate thereof, or the pharmaceutically acceptable salt thereof of claim 2, wherein Ring B is linked to another adjacent group through two nitrogen atoms.

【Claim 4】

The compound, the stereoisomer thereof, the solvate thereof, the hydrate thereof, or the pharmaceutically acceptable salt thereof of claim 1, wherein when R² is pyridinyl, thiazolyl, phenyl, pyrazinyl, pyrimidinyl, or pyridonyl, R² is substituted with at least one R³, or when R² is imidazolyl or quinoline, R² is not substituted, and

R³ is at least one substituent selected from the group consisting of a straight or branched C₁-C₃ alkyl, a straight or branched C₁-C₃ haloalkyl, a straight or branched C₁-C₃ alkoxy, a halogen, a C₁-C₃ alkanesulfonamido, an amino substituted with at least one straight or branched C₁-C₃ alkyl, and nitrile.

【Claim 5】

The compound, the stereoisomer thereof, the solvate thereof, the hydrate thereof, or the pharmaceutically acceptable salt thereof of claim 1, wherein the compound of Chemical Formula 1 is any one selected from the following compounds:

- <1> 2-(6-(6-((6-methoxypyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)furo[3,2-*d*]pyrimidin-4-amine; <2> 2-(6-(6-((6-methoxypyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)thieno[3,2-*d*]pyrimidin-4-amine; <3>
- 5 2-(6-(6-((6-methoxypyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <4> 2-(6-(6-((6-methoxypyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-(trifluoromethyl)-1*H*-pyrazol-3-yl)furo[3,2-*d*]pyrimidin-4-amine; <5> *N*-(5-methyl-1*H*-pyrazol-3-yl)-2-(6-(6-((5-methylthiazol-2-yl)methyl)-3,6-
- 10 diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)quinazolin-4-amine; <6> 2-(6-(3-((6-methoxypyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-6-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <7> 2-(6-(6-((6-methoxypyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)-6,7-dihydro-5*H*-cyclopenta[*d*]pyrimidin-4-amine; <8> *N*-(5-methyl-
- 15 1*H*-pyrazol-3-yl)-2-(6-(6-((6-(trifluoromethyl)pyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)quinazolin-4-amine; <9> 5-((3-(5-(4-((5-methyl-1*H*-pyrazol-3-yl)amino)quinazolin-2-yl)pyridin-2-yl)-3,6-diazabicyclo[3.1.1]heptan-6-yl)methyl)picolinonitrile; <10> *N*-(5-methyl-1*H*-pyrazol-3-yl)-2-(6-(6-((6-methylpyridin-3-yl)methyl)-3,6-
- 20 diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)quinazolin-4-amine; <11> 2-(6-(6-(3,5-difluoro-4-isopropoxybenzyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <12> 2-methoxy-5-((3-(5-(4-((5-methyl-1*H*-pyrazol-3-yl)amino)quinazolin-2-yl)pyridin-2-yl)-3,6-diazabicyclo[3.1.1]heptan-6-yl)methyl)benzonitrile; <13> 2-(6-(6-((1*H*-imidazol-5-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-
- 25

pyrazol-3-yl)quinazolin-4-amine; <14> 2-(6-(6-(4-methoxybenzyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <15> 2-(6-(6-((6-isopropoxy)pyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <16> 2-(6-(6-((5-chloro-6-methoxy)pyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <17> 2-(6-(6-((5-methoxy)pyrazin-2-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <18> *N*-(5-methyl-1*H*-pyrazol-3-yl)-2-(6-(6-(quinolin-6-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)quinazolin-4-amine; <19> *N*-(5-methyl-1*H*-pyrazol-3-yl)-2-(6-(6-((4-methylthiazol-2-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)quinazolin-4-amine; <20> 2-(6-(6-((6-(dimethylamino)pyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <21> *N*-(4-((3-(5-(4-((5-methyl-1*H*-pyrazol-3-yl)amino)quinazolin-2-yl)pyridin-2-yl)-3,6-diazabicyclo[3.1.1]heptan-6-yl)methyl)phenyl)methanesulfonamide; <22> 2-(6-(6-(4-fluorobenzyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <23> 2-(6-(6-((6-fluoropyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <24> 2-(6-(6-((6-ethoxy)pyridin-3-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <25> *N*-(5-methyl-1*H*-pyrazol-3-yl)-2-(6-(6-((2-methylpyrimidin-5-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-yl)quinazolin-4-amine; <26> *N*-(5-methyl-1*H*-pyrazol-3-yl)-2-(6-(6-((5-methylpyrazin-2-yl)methyl)-3,6-diazabicyclo[3.1.1]heptan-3-yl)pyridin-3-

yl)quinazolin-4-amine; <27> 1-methyl-4-((3-(5-(4-((5-methyl-1*H*-pyrazol-3-yl)amino)quinazolin-2-yl)pyridin-2-yl)-3,6-diazabicyclo[3.1.1]heptan-6-yl)methyl)pyridin-2(1*H*)-one; <28> 2-(6-((2*S*,5*R*)-4-((6-methoxypyridin-3-yl)methyl)-2,5-dimethylpiperazin-1-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <29> 2-(6-(4-((6-methoxypyridin-3-yl)methyl)-3,3-dimethylpiperazin-1-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <30> 2-(6-(4-((6-methoxypyridin-3-yl)methyl)-1,4-diazepan-1-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <31> 2-(6-((1*S*,4*S*)-5-((6-methoxypyridin-3-yl)methyl)-2,5-diazabicyclo[2.2.1]heptan-2-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <32> 2-(6-((2*R*,5*S*)-4-((6-methoxypyridin-3-yl)methyl)-2,5-dimethylpiperazin-1-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <33> (*S*)-2-(6-(4-((6-methoxypyridin-3-yl)methyl)-3-methylpiperazin-1-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <34> 2-(6-((1*R*,4*R*)-5-((6-methoxypyridin-3-yl)methyl)-2,5-diazabicyclo[2.2.1]heptan-2-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <35> 2-(6-((3*R*,5*S*)-4-((6-methoxypyridin-3-yl)methyl)-3,5-dimethylpiperazin-1-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; <36> (*R*)-2-(6-(4-((6-methoxypyridin-3-yl)methyl)-3-methylpiperazin-1-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine; and <37> 2-(6-(4-((6-methoxypyridin-3-yl)methyl)-4,7-diazaspiro[2.5]octan-7-yl)pyridin-3-yl)-*N*-(5-methyl-1*H*-pyrazol-3-yl)quinazolin-4-amine.

【Claim 6】

A method for preparing a compound of Chemical Formula 1, the method comprising: preparing a compound of Chemical Formula 3 from a compound of Chemical Formula 2;

preparing a compound of Chemical Formula 4 from the compound of Chemical Formula 3;

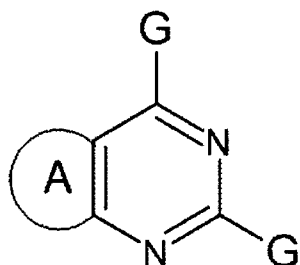
preparing a compound of Chemical Formula 5 from the compound of Chemical Formula 4;

5 preparing a compound of Chemical Formula 6 from the compound of Chemical Formula 5;

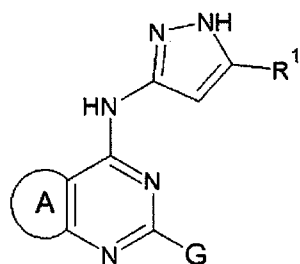
preparing a compound of Chemical Formula 7 from the compound of Chemical Formula 6; and

Preparing the compound of Chemical Formula 1 from the compound of Chemical Formula 7:

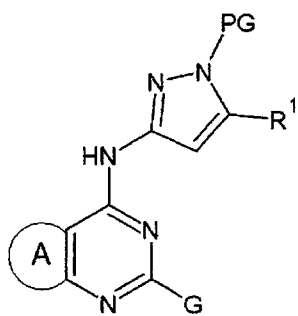
[Chemical Formula 2]



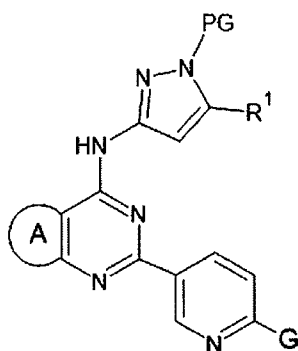
[Chemical Formula 3]



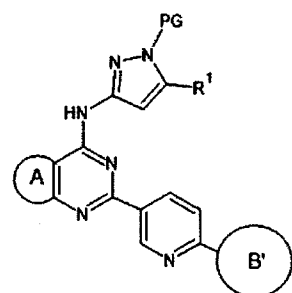
15 [Chemical Formula 4]



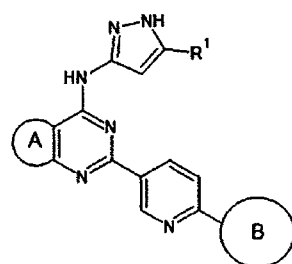
[Chemical Formula 5]



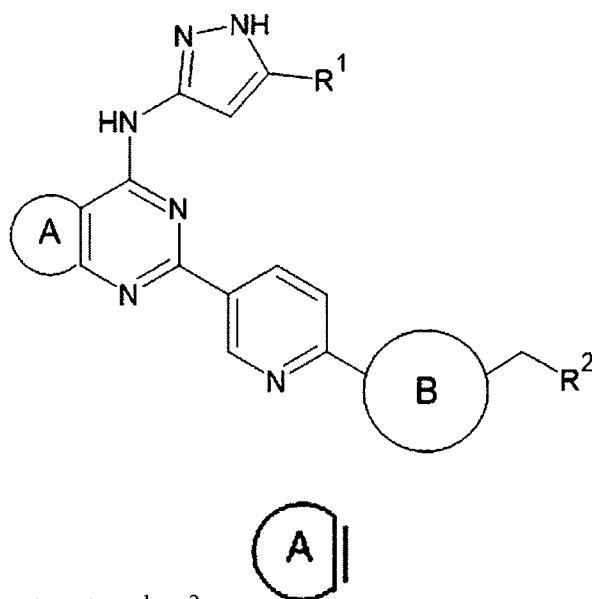
[Chemical Formula 6]



[Chemical Formula 7]



[Chemical Formula 1]



wherein R^1 , R^2 , , and Ring B are the same as those defined above,

G is a leaving group,

PG is a protecting group, and

- 5 Ring B' has the same structure as Ring B, but is a form in which one nitrogen atom is protected by a protecting group.

【Claim 7】

A pharmaceutical composition containing the compound of Chemical
Formula 1, the stereoisomer thereof, the solvate thereof, the hydrate thereof, or the
10 pharmaceutically acceptable salt thereof of claim 1 as an active ingredient for the
prevention or treatment of cancer.

【Claim 8】

The pharmaceutical composition of claim 7, wherein the compound exhibits
inhibitory activity against one or more protein kinases selected from the group
15 consisting of ABL1(H396P)-nonphosphorylated, ABL1(H396P)-phosphorylated,
ABL1(M351T)-phosphorylated, ABL1(Q252H)-phosphorylated, ABL1(T315I)-
nonphosphorylated, ABL1(T315I)-phosphorylated, ABL1(Y253F)-phosphorylated,
ABL1-phosphorylated, AMPK-alpha1, AURKA, AURKC, AXL, BLK, BTK,

CSNK2A1, CSNK2A2, DAPK3, DDR1, DDR2, DLK, EGFR(L747-E749del, A750P), EGFR(L858R,T790M), EGFR(T790M), EPHB6, FGFR1, FGR, FLT3, FLT3(D835H), FLT3(D835V), FLT3(D835Y), FLT3(ITD), FLT3(ITD,D835V), FLT3(ITD,F691L), FLT3(K663Q), FLT3(N841I), FLT3(R834Q), FLT3-
5 autoinhibited, FRK, GCN2(Kin.Dom.2,S808G), HCK, ICK, ITK, JAK1(JH1domain-catalytic), JAK1(JH2domain-pseudokinase), JAK2(JH1domain-catalytic), JAK3(JH1domain-catalytic), KIT(A829P), KIT(D816V), KIT(V559D), LCK, MAP3K2, MEK2, MEK3, MEK5, MERTK, MST1, PDGFRB, PLK4, RET, RET(M918T), RET(V804L), RET(V804M), RIOK3, SNARK, SRC, SYK, TRKA,
10 TRKB, TRKC, TYK2(JH1domain-catalytic), YES, and YSK4.

【Claim 9】

The pharmaceutical composition of claim 7, wherein the compound exhibits RET enzyme inhibitory activity.

【Claim 10】

15 The pharmaceutical composition of claim 7, wherein the cancer is one or more selected from the group consisting of pseudomyxoma, intrahepatic cholangiocarcinoma, hepatoblastoma, liver cancer, thyroid cancer, medullary thyroid carcinoma, colon cancer, testicular cancer, myelodysplastic syndrome, glioblastoma, oral cancer, lip cancer, mycosis fungoides, acute myelogenous leukemia, acute
20 lymphoblastic leukemia, basal cell carcinoma, ovarian epithelial cancer, ovarian germ cell cancer, male breast cancer, brain cancer, pituitary adenoma, multiple myeloma, gallbladder cancer, bile duct cancer, colorectal cancer, chronic myelogenous leukemia, chronic lymphocytic leukemia, retinoblastoma, choroidal melanoma, ampulla of Vater cancer, bladder cancer, peritoneal cancer, parathyroid

cancer, adrenal gland cancer, paranasal sinus cancer, non-small-cell lung cancer, tongue cancer, astrocytoma, small cell lung cancer, pediatric brain cancer, pediatric lymphoma, pediatric leukemia, small intestine cancer, meningioma, esophageal cancer, neuroglioma, renal pelvic cancer, renal cancer, heart cancer, duodenal cancer,

5 malignant soft tissue cancer, malignant bone cancer, malignant lymphoma, malignant mesothelioma, malignant melanoma, eye cancer, vulvar cancer, ureteral cancer, urothelial cancer, cancer of unknown primary site, gastric lymphoma, gastric cancer, gastric carcinoid tumors, gastrointestinal stromal cancer, Wilm's cancer, breast cancer, sarcoma, penile cancer, pharynx cancer, gestational trophoblastic disease,

10 cervical cancer, endometrial cancer, uterine sarcoma, prostate cancer, metastatic bone cancer, metastatic brain cancer, mediastinal cancer, rectal cancer, rectal carcinoid tumors, vaginal cancer, spinal cord cancer, acoustic neurinoma, pancreatic cancer, salivary gland cancer, Kaposi's sarcoma, Paget's disease, tonsil cancer, squamous cell cancer, lung adenocarcinoma, lung cancer, lung squamous cell cancer,

15 skin cancer, anal cancer, rhabdomyosarcoma, laryngeal cancer, pleural cancer, blood cancer, and thymus cancer.

【Claim 11】

The pharmaceutical composition of claim 7, wherein the cancer is a cancer, which expresses a RET fusion gene.

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