azabicyclo[3.2.1]octan-8-yl group,
(iii-9) amino group,
(iii-10) methylamino group, ethylamino group, isopropylamino group, hydroxyethylamino group, dimethylamino group, phenyl methylamino group,
(iii-11) C1-C6 alkoxy group that may have one or more of either halogen, C3-C7 saturated cycloalkyl group, or monocyclic or bicyclic unsaturated heterocycloalkyl group having at least one heteroatom selected from the group consisting of N, S, and O as a substituent,
(iii-12) benzyloxy group that may have one or more carbamoyl group as a substituent
(iii-13) C1-C4 alkylthio group,
(iii-14) C1-C4 alkylsulfonyl group, or
(iii-15) aminosulfonyl group.

[0056]

When R_5 has one or more R_6, R_6 in Formula (A) is more preferably one of:
(iv-1) fluorine, chlorine
(iv-2) hydroxy group,
(iv-3) cyano group,
(iv-4) methyl group,
(iv-7) 3-fluoro pyrrolidinyl group, morpholinyl group, thiomorpholinyl group, 3-hydroxy azetidinyl group, azetidinyl group,
(iv-9) amino group,
(iv-10) methylamino group,
(iv-11) C1-C6 alkoxy group that may have one or more of either halogen or C3-C7 saturated cycloalkyl group as a substituent, or
(iv-13) C1-C4 alkylthio group.

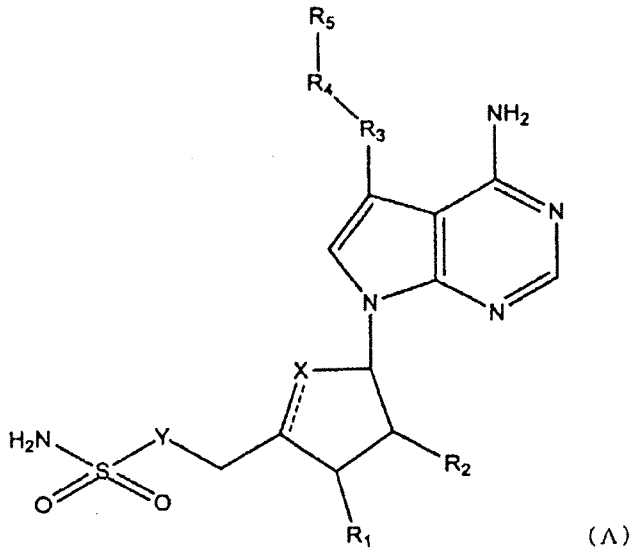
[0057]

When R_5 has one or more R_6, R_6 in Formula (A) is more preferably one of:
(v-1) fluorine,
(v-4) methyl group,

CLAIMS

[Claim 1]

A compound or a salt thereof, represented by Formula (A) below:



(A)

wherein:

is a single bond or a double bond;

X is -O-, $-CH_2-$, or -CH=;

Y is -NH- or -O-;

R_1 is hydrogen, fluorine, a hydroxy group, a cyano group, or an amino group;

R_2 is hydrogen, fluorine, a hydroxy group, a cyano group, or an amino group;

R_3 is a vinylene group, an ethynylene group, a C6-C14 arylene group, or a monocyclic or bicyclic heteroarylene group having at least one heteroatom selected from the group consisting of N, S, and O;

R_4 is a bond, a methylene group, or a C3-C7 cycloalkylidene group;

R_5 is a C3-C7 saturated cycloalkyl group that may have one or more R_6, a C6-C10 unsaturated cycloalkyl group that may

have one or more R_6, or a monocyclic or bicyclic unsaturated heterocycloalkyl group that has at least one heteroatom selected from the group consisting of N, S, and O, and that may have one or more R_6;

R_6 is

halogen,

a hydroxy group,

a cyano group,

a C1-C6 alkyl group that may have one or more phenoxy group as a substituent,

a carbamoyl group,

a C1-C6 alkoxycarbonyl group,

a monocyclic or bicyclic unsaturated heterocycloalkyl group having at least one heteroatom selected from the group consisting of N, S, and O,

a monocyclic or bicyclic saturated heterocycloalkyl group that has at least one heteroatom selected from the group consisting of N, S, and O, and that may have one or more of either halogen, hydroxy group, carboxyl group, or C1-C6 alkyl group as a substituent,

an amino group,

a mono- or di-(C1-C4 alkyl) amino group that may have one or more hydroxy group or phenyl group as a substituent,

a C1-C6 alkoxy group that may have one or more of either halogen, C3-C7 saturated cycloalkyl group, or monocyclic or bicyclic unsaturated heterocycloalkyl group having at least one heteroatom selected from the group consisting of N, S, and O as a substituent,

a benzyloxy group that may have one or more carbamoyl group as a substituent,

a C1-C6 alkylthio group,

a C1-C6 alkylsulfonyl group, or

an aminosulfonyl group,

when two or more R_6 are present, the plurality of R_6 may be the same or different.

[Claim 2]

The compound or a salt thereof according to Claim 1, wherein in Formula (A), R_1 is hydrogen, fluorine, or a hydroxy group;

R_2 is hydrogen, fluorine, or a hydroxy group; and

R_3 is an ethynylene group, or a monocyclic or bicyclic heteroarylene group having 1 to 4 of at least one kind of heteroatom selected from the group consisting of N, S, and O.

[Claim 3]

The compound or a salt thereof according to Claim 1 or 2, wherein in Formula (A), R_1 is a hydroxy group;

R_2 is hydrogen or a hydroxy group;

R_3 is an ethynylene group, or a monocyclic heteroarylene group having 2 of at least one kind of heteroatom selected from the group consisting of N, S and O;

R_5 is a C3-C7 saturated cycloalkyl group that may have one or more R_6, a C6-C10 unsaturated cycloalkyl group that may have one or more R_6, or a monocyclic or bicyclic unsaturated heterocycloalkyl group that has at least one heteroatom selected from the group consisting of N, S, and O, and that may have one or more R_6; and

R_6 is halogen; a hydroxy group; a cyano group; a C1-C6 alkyl group that may have one or more phenoxy group as a substituent; a carbamoyl group; a C1-C6 alkoxycarbonyl group; a monocyclic or bicyclic unsaturated heterocycloalkyl group having at least one heteroatom selected from the group consisting of N, S and O; a monocyclic or bicyclic saturated heterocycloalkyl group that has at least one heteroatom selected from the group consisting of N, S, and O, and that may have one or more of either halogen, hydroxy group, carboxyl group, or C1-C6 alkyl group as a substituent; an amino group; a mono- or di-(C1-C4 alkyl) amino group that may have one or more hydroxy group or phenyl group as a substituent; a C1-C6 alkoxy group that may have

one or more of either halogen, C3-C7 saturated cycloalkyl group, or monocyclic or bicyclic unsaturated heterocycloalkyl group having at least one heteroatom selected from the group consisting of N, S, and O as a substituent; a benzyloxy group that may have one or more carbamoyl group as a substituent; a C1-C4 alkylthio group; a C1-C4 alkylsulfonyl group; or an aminosulfonyl group (when two or more R_6 are present, the plurality of R_6 may be the same or different).

[Claim 4]

A compound or a salt thereof according to any one of Claims 1 to 3, wherein, in Formula (A), R_1 is a hydroxy group;

R_2 is hydrogen or a hydroxy group;

R_3 is an ethynylene group, or a monocyclic heteroarylene group having 2 of at least one kind of heteroatom selected from the group consisting of N, S and O;

R_5 is a C3-C7 saturated cycloalkyl group that may have one or more R_6; a C6-C10 unsaturated cycloalkyl group that may have one or more R_6, or a monocyclic or bicyclic unsaturated heterocycloalkyl group that has at least one heteroatom selected from the group consisting of N, S, and O, and that may have one or more R_6; and

R_6 is fluorine; chlorine; a hydroxy group; a cyano group; a C1-C6 alkyl group that may have one or more phenoxy group as a substituent; a carbamoyl group; a C1-C6 alkoxycarbonyl group; a pyridinyl group; an azetidinyl group; a hydroxy azetidinyl group; a thiomorpholinyl group; a dioxide thiomorpholinyl group; a methyl piperazinyl group; a hydroxy piperidinyl group; an oxopiperidinyl group; a piperidinyl group; a hydroxy pyrrolidinyl group; an oxopyrrolidinyl group; a pyrrolidinyl group; a carboxyl pyrrolidinyl group; a fluoro pyrrolidinyl group; a morpholinyl group; a 9-oxa-3-azabicyclo[3.3.1]nonan-3-yl group; a 3-oxa-8-

azabicyclo[3.2.1]octan-8-yl group; an amino group; a methylamino group; an ethylamino group; an isopropylamino group; a hydroxyethylamino group; a dimethylamino group; a phenyl methylamino group; a C1-C6 alkoxy group that may have one or more of either halogen, C3-C7 saturated cycloalkyl group, or monocyclic or bicyclic unsaturated heterocycloalkyl group having at least one heteroatom selected from the group consisting of N, S, and O as a substituent; a benzyloxy group that may have one or more carbamoyl group as a substituent; a C1-C4 alkylthio group; a C1-C4 alkylsulfonyl group; or an aminosulfonyl group (when two or more R_6 are present, the plurality of R_6 may be the same or different).

[Claim 5]

A compound or a salt thereof according to Claims 1 to 4, wherein, in Formula (A), R_1 is a hydroxy group;

R_2 is a hydroxy group;

R_3 is an ethynylene group;

R_4 is a bond;

R_5 is a C6-C10 unsaturated cycloalkyl group that may have one or more R_6; or a monocyclic or bicyclic unsaturated heterocycloalkyl group that has at least one heteroatom selected from the group consisting of N, S, and O, and that may have one or more R_6; and

R_6 is fluorine; chlorine; a hydroxy group; a cyano group; a methyl group; a 3-fluoro pyrrolidinyl group; a morpholinyl group; a thiomorpholinyl group; a 3-hydroxy azetidinyl group; an azetidinyl group; an amino group; a N-methylamino group; a C1-C6 alkoxy group that may have one or more of either halogen or C3-C7 saturated cycloalkyl group as a substituent; or a C1-C4 alkylthio group (when two or more R_6 are present, the plurality of R_6 may be the same or different).

[Claim 6]

A compound or a salt thereof according to Claims 1 to

5, wherein in Formula (A), Y is -NH-;

R_1 is a hydroxy group;

R_2 is a hydroxy group;

R_3 is an ethynylene group;

R_4 is a bond;

R_5 is a phenyl group or a naphthyl group that may have one or more R_6; or a monocyclic or bicyclic unsaturated heterocycloalkyl group that has at least one heteroatom selected from the group consisting of N, S and O, and that may have one or more R_6;

R_6 is fluorine; a methyl group; a 3-fluoro pyrrolidinyl; a 3-hydroxy azetidinyl; azetidinyl; an amino group; a N-methylamino group; a C1-C6 alkoxy group that may have one or more cyclopropyl group; or a C1-C4 alkylthio group (when two or more R_6 are present, the plurality of R_6 may be the same or different).

[Claim 7]

The compound or a salt thereof according to any one of Claims 1 to 6, wherein the compound or a salt thereof is at least one member selected from the group consisting of: 4-amino-5-[2-(2,6-difluoro phenyl)ethynyl]-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]pyrrolo[2,3-d]pyrimidine;

4-amino-5-[2-(4-amino-2,6-difluoro-phenyl)ethynyl]-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]pyrrolo[2,3-d]pyrimidine;

4-amino-5-[2-[2,6-difluoro-4-(methylamino)phenyl]ethynyl]-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]pyrrolo[2,3-d]pyrimidine;

4-amino-5-[2-[2,6-difluoro-4-[(3R)-3-fluoro pyrrolidin-1-yl]phenyl]ethynyl]-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]pyrrolo[2,3-

d]pyrimidine;
4-amino-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]-5-[2-(2-ethoxy-4,6-difluoro-phenyl)ethynyl]pyrrolo[2,3-d]pyrimidine;
4-amino-5-[2-[2,6-difluoro-4-(3-hydroxy azetidin-1-yl)phenyl]ethynyl]-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]pyrrolo[2,3-d]pyrimidine;
4-amino-5-[2-[4-(azetidin-1-yl)-2,6-difluoro-phenyl]ethynyl]-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]-tetrahydrofuran-2-yl]pyrrolo[2,3-d]pyrimidine;
4-amino-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]-5-[2-(2-ethoxy-6-fluoro-phenyl)ethynyl]pyrrolo[2,3-d]pyrimidine;
4-amino-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]-5-[2-(2-fluoro-6-propoxy-phenyl)ethynyl]pyrrolo[2,3-d]pyrimidine;
8-[2-[4-amino-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]pyrrolo[2,3-d]pyrimidin-5-yl]ethynyl]-7-fluoro-4-methyl-2,3-dihydro-1,4-benzoxazine;
4-amino-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]-5-[2-(2-ethylsulfanyl-6-fluoro-phenyl)ethynyl]pyrrolo[2,3-d]pyrimidine;
4-amino-5-[2-[2-(cyclopropyl methoxy)-6-fluoro-phenyl]ethynyl]-7-[(2R,3R,4S,5R)-3,4-dihydroxy-5-[(sulfamoylamino)methyl]tetrahydrofuran-2-yl]pyrrolo[2,3-d]pyrimidine;
4-amino-7-[(1R,2S,3R,4R)-2,3-dihydroxy-4-[(sulfamoylamino)methyl]cyclopentyl]-5-[2-(2-fluoro-6-methylsulfanyl-phenyl)ethynyl]pyrrolo[2,3-d]pyrimidine;
8-[2-[4-amino-7-[(1R,2S,3R,4R)-2,3-dihydroxy-4-[(sulfamoylamino)methyl]cyclopentyl]pyrrolo[2,3-d]pyrimidin-5-yl]ethynyl]-7-fluoro-4-methyl-2,3-dihydro-1,4-benzoxazine;
4-amino-7-[(1R,4R,5S)-4,5-dihydroxy-3-

[(sulfamoylamino)methyl]cyclopent-2-en-1-yl]-5-[2-(2-ethoxy-6-fluoro-phenyl)ethynyl]pyrrolo[2,3-d]pyrimidine; and
4-amino-7-[(1R,4R,5S)-4,5-dihydroxy-3-[(sulfamoylamino)methyl]cyclopent-2-en-1-yl]-5-[2-(2-fluoro-6-methylsulfanyl-phenyl)ethynyl]pyrrolo[2,3-d]pyrimidine; and salts of these compounds.

[Claim 8]

An NAE inhibitor comprising the compound or a salt thereof according to any one of Claims 1 to 7, as an active ingredient.

[Claim 9]

A pharmaceutical composition comprising the compound or a salt thereof according to any one of Claims 1 to 7.

[Claim 10]

An antitumor agent comprising the compound or a salt thereof according to any one of Claims 1 to 7.