6636-6641

Non Patent Literature 15: A Nickless, et al., *Cell Biosci*. 2017, 7, 26

Non Patent Literature 16: Cheruiyot, et al., *Cancer Res*. 2021, 81(17), 4499-4513

Non Patent Literature 17: J P Becker, et al., *iScience* 2021, 24(4), 102389

Summary

Problems to be solved by the disclosure

[0005]

An object of the present disclosure is to provide novel compounds having SMG1 inhibitory activity and anticancer activity, or pharmaceutically acceptable salts thereof, and the like.

Means for solution of the problems

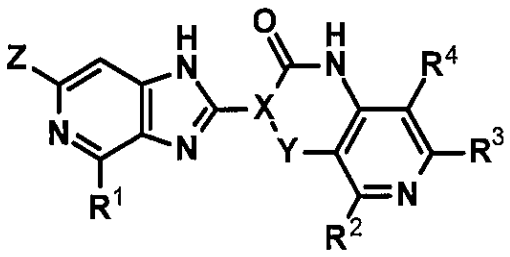
[0006]

To solve the above object, the present inventors synthesized compounds having various structures to search for compounds having an SMG1 inhibitory effect and exhibiting an anticancer effect. As a result, the present inventors found the compounds of the present disclosure and pharmaceutically acceptable salts thereof, thus completing the present disclosure. That is, the present disclosure is as described below.

[0007]

That is, the present disclosure includes the following examples.

[1] A compound represented by formula (1), or a pharmaceutically acceptable salt thereof:



(1)

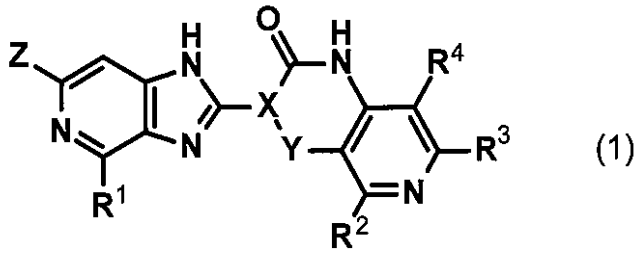
where in formula (1),

R^1 represents a hydrogen atom, a C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a hydroxyl group or a halogen atom, a C3-C6 cycloalkyl group, a phenyl group, where the phenyl group may be substituted with an amino group or a halogen atom,

cervical cancer, pancreatic cancer, skin cancer, adrenal cancer, biliary tract cancer, thymic cancer, mesothelioma, bladder cancer, and brain tumor.

[0007a]

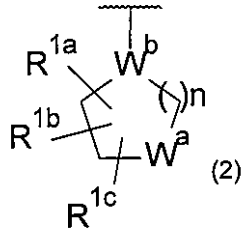
In an aspect of the present disclosure, there is provided a compound represented by formula (1), or a pharmaceutically acceptable salt thereof:



(1)

where in formula (1),

R^1 represents a hydrogen atom, a C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a hydroxyl group or a halogen atom, a C3-C6 cycloalkyl group, a phenyl group, where the phenyl group may be substituted with an amino group or a halogen atom, a 2-tert butylamino-2-oxoethyl group, a [dimethyl(oxido)-λ6-sulfanylidene]amino group, a group represented by the following formula (2):



(2)

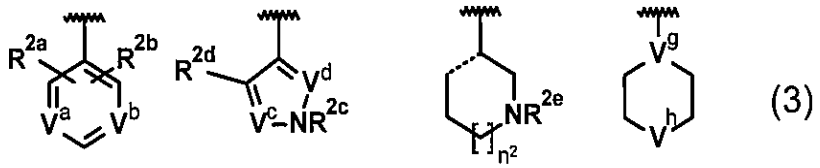
where in formula (2), W^a represents CH_2, an oxygen atom, or N-R^{1f}, W^b represents CH, a nitrogen atom, or C-OH, R^{1a}, R^{1b}, and R^{1c} each independently represent the same or different hydrogen atom, halogen atom, hydroxyl group, C1-C6 alkyl group optionally substituted with a halogen atom, amino group, or oxo group, and n represents 0, 1, or 2,

or -$NR^{1d}R^{1e}$;

R^{1d} and R^{1e} each independently represent the same or different hydrogen atom, C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a halogen atom or a 4- to 7-membered heterocyclic group, a 4- to 7-membered heterocyclic group, or a C3-C6 cycloalkyl group optionally substituted with a hydroxyl group;

R^{1f} represents a hydrogen atom, a C1-C6 alkyl group, or a C3-C6 cycloalkyl group;

R^{2} represents a hydrogen atom, a C1-C6 alkyl group, a C3-C6 cycloalkyl group optionally substituted with a C1-C6 alkyl group, a 2,4-dimethylpyrazolyl group, or any group selected from the following formula (3):



(3)

where in formula (3), the broken line represents a single bond or a double bond, V^{a} represents C-R^{2f} or a nitrogen atom, V^{b} represents C-R^{2g} or a nitrogen atom, V^{c} represents C-R^{2j} or a nitrogen atom, V^{d} represents C-R^{2k} or a nitrogen atom, V^{g} represents CH or a nitrogen atom, V^{h} represents $CHN(CH_3)_2$, N-R^{2l}, or an oxygen atom, and n^{2} represents 1 or 2,

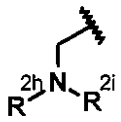
R^{2a} and R^{2b} each independently represent the same or different hydrogen atom, halogen atom, hydroxyl group, cyano group, C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a hydroxyl group, a halogen atom, or a 4- to 7-membered heterocyclic group, a C1-C6 alkoxy group, where the C1-C6 alkoxy group may be substituted with a halogen atom or deuterium, or a C3-C6 cycloalkyl group,

R^{2c} represents a C3-C6 cycloalkyl group or a C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a C3-C6 cycloalkyl group or a halogen atom,

R^{2d} represents a hydrogen atom, a C1-C6 alkyl group optionally substituted with a halogen atom, a C1-C6 alkoxy group, or a C3-C6 cycloalkyl group,

R^{2e} represents a C1-C6 alkylsulfonyl group, a C3-C6 cycloalkylsulfonyl group, a benzenesulfonyl group, where the benzenesulfonyl group may be substituted with a C1-C6 alkyl group or a halogen atom, a C3-C6 cycloalkylcarbonyl group, a C1-C6 alkylcarbonyl group, or a benzoyl group, where the benzoyl group may be substituted with a C1-C6 alkyl group or a halogen atom,

R^{2f} and R^{2g} each independently represent the same or different hydrogen atom, halogen atom, C1-C6 alkoxy group optionally substituted with a halogen atom, or C1-C6 alkyl group optionally substituted with a hydroxyl group, or the following formula (4)



(4)

where in formula (4), R^{2h} and R^{2i} each independently represent the same or different C1-C6 alkyl group, or R^{2h} and R^{2i} may be bonded to each other to form a 4- to 7-membered heterocyclic group optionally substituted with a C1-C6 alkyl group,

R^{2j} and R^{2k} each independently represent the same or different hydrogen atom, C1-C6 alkyl group optionally substituted with a halogen atom, or C3-C6 cycloalkyl group, or

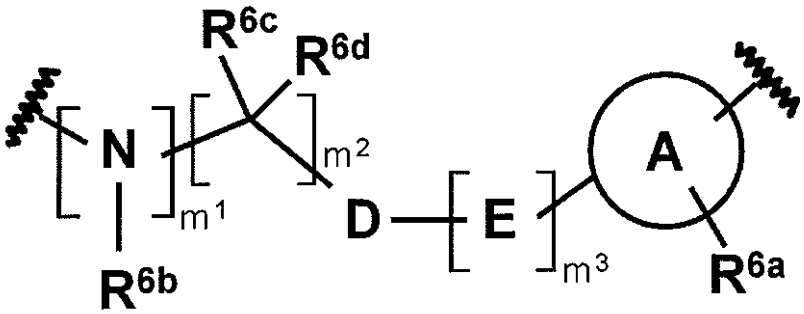
R^{2c} and R^{2k} may be bonded to each other to form a group shown below,



R^{2l} represents a C1-C6 alkyl group or a C3-C6 cycloalkyl group;

or alternatively, R^1 and R^2 may be bonded to each other to form a group represented by the following formula (5),

where the leftmost bond of each group represents the bond between the aromatic ring and R^1 of the compound represented by formula (1), and the rightmost bond represents the bond between the aromatic ring and R^2 of the compound represented by formula (1),



(5)

where in formula (5), A represents an aryl group, a heteroaryl group, or a 4- to 7-membered heterocyclic group, R^{6a} represents a hydrogen atom, a halogen atom, a C1-C6 alkyl group, a C3-C6 cycloalkyl group, or a C1-C6 alkoxy group, D represents $-NR^{6e}CO-$ or $-CONR^{6f}-$, E represents $-CR^{6g}R^{6h}-$, $-NR^{6i}-$, -O-, -S-, -SO-, or $-SO_2-$, and when there are a plurality of Es, the plurality of Es may be the same or different, R^{6b}, R^{6c}, R^{6d}, R^{6e}, R^{6f}, R^{6g}, R^{6h}, and R^{6i}

each independently represent a hydrogen atom, a C1-C6 alkyl group, or a C3-C6 cycloalkyl group, or R^{6b} and R^{6c}, R^{6b} and R^{6e}, or R^{6c} and R^{6d} may be bonded to each other to form a ring, m^1 represents 0 or 1, m^2 represents 1, 2, 3, 4, or 5, and m^3 represents 0, 1, 2, or 3;

R^3 represents a hydrogen atom, a halogen atom, a C1-C6 alkyl group, or a 1-methyl-3,6-dihydro-2H-pyrazin-5-yl group;

R^4 represents a hydrogen atom or a halogen atom;

X-Y represents C=CH or N-CH_2; and

Z represents a hydrogen atom, a halogen atom, a C1-C6 alkyl group optionally substituted with a halogen atom, a C1-C6 alkoxy group, a cyano group, or a C1-C6 alkoxycarbonyl group.

[0007b]

In another aspect of the present disclosure, there is provided 3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one, or a pharmaceutically acceptable salt thereof.

[0007c]

In a further aspect of the present disclosure, there is provided 3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one 1,2-ethanedisulfonate.

[0007d]

In another aspect of the present disclosure, there is provided 3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one methanesulfonate.

[0007e]

In a further aspect of the present disclosure, there is provided 3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one benzenesulfonate.

[0007f]

In another aspect of the present disclosure, there is provided 3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one adipate.

[0007g]

In a further aspect of the present disclosure, there is provided an SMG1 inhibitor comprising the compound as disclosed herein, or a pharmaceutically acceptable salt thereof, as an active ingredient.

[0007h]

In another aspect of the present disclosure, there is provided an NMD inhibitor comprising the compound as disclosed herein, or a pharmaceutically acceptable salt thereof, as an active ingredient.

[0007i]

In a further aspect of the present disclosure, there is provided a pharmaceutical composition comprising the compound as disclosed herein, or a pharmaceutically acceptable salt thereof, as an active ingredient, and optionally comprising a pharmaceutically acceptable carrier.

[0007j]

In another aspect of the present disclosure, there is provided a pharmaceutical composition as disclosed herein for use in treating cancer.

[0007k]

In a further aspect of the present disclosure, there is provided an anticancer agent comprising the compound as disclosed herein, or a pharmaceutically acceptable salt thereof, as an active ingredient.

[0007l]

In another aspect of the present disclosure, there is provided a compound as disclosed herein, or a pharmaceutically acceptable salt thereof, for use in treating cancer.

[0007m]

In a further aspect of the present disclosure, there is provided a compound as disclosed herein, or a pharmaceutically acceptable salt thereof, for use in treating cancer, which is to be administered in combination with an immune checkpoint inhibitor.

[0007n]

In another aspect of the present disclosure, there is provided a use of the compound as disclosed herein, or a pharmaceutically acceptable salt thereof, in the manufacture of a

medicament for the treatment of cancer.

Advantageous Effects of Invention

[0008]

The compound of the present invention, or a pharmaceutically acceptable salt thereof, exhibits SMG1 and NMD inhibitory activity, an anticancer effect as a single agent, and an anticancer effect in combination with an immune checkpoint inhibitor.

Brief Description of Drawings

[0009]

Fig. 1 is a diagram showing the diffraction pattern of powder X-ray diffraction (CuKα, λ = 1.54 angstroms, scan speed = 20°/min) of the salt crystal obtained in Example 138. The vertical axis of the figure indicates the diffraction intensity as relative line intensity, and the horizontal axis indicates the diffraction angle 2θ.

Fig. 2 is a diagram showing the diffraction pattern of powder X-ray diffraction (CuKα, λ = 1.54 angstroms, scan speed = 20°/min) of the salt crystal obtained in Example 155. The vertical axis of the figure indicates the diffraction intensity as relative line intensity, and the horizontal axis indicates the diffraction angle 2θ.

Fig. 3 is a diagram showing the diffraction pattern of powder X-ray diffraction (CuKα, λ = 1.54 angstroms, scan speed = 20°/min) of the salt crystal obtained in Example 156. The vertical axis of the figure indicates the diffraction intensity as relative line intensity, and the horizontal axis indicates the diffraction angle 2θ.

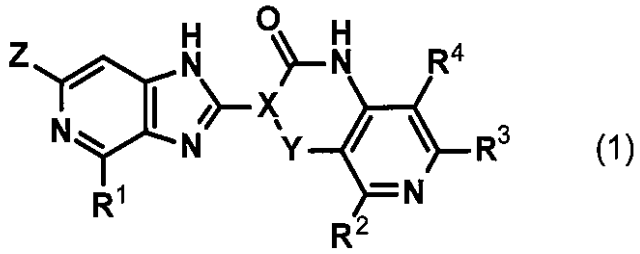
Fig. 4 is a diagram showing the diffraction pattern of powder X-ray diffraction (CuKα, λ = 1.54 angstroms, scan speed = 20°/min) of the salt crystal obtained in Example 157. The vertical axis of the figure indicates the diffraction intensity as relative line intensity, and the horizontal axis indicates the diffraction angle 2θ.

Fig. 5 is a diagram showing the antitumor effect of the compound of Example 32, administered alone and in combination with an immune checkpoint inhibitor (anti-mouse PD-L1 antibody), against subcutaneously implanted MC38 mouse colorectal cancer cell line in mice. In the figure, the horizontal `axis indicates the number of days from the first

What is claimed is:

Claim 1

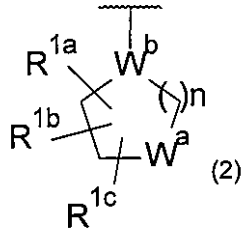
A compound represented by formula (1), or a pharmaceutically acceptable salt thereof:



(1)

where in formula (1),

R^1 represents a hydrogen atom, a C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a hydroxyl group or a halogen atom, a C3-C6 cycloalkyl group, a phenyl group, where the phenyl group may be substituted with an amino group or a halogen atom, a 2-tert butylamino-2-oxoethyl group, a [dimethyl(oxido)-λ6-sulfanylidene]amino group, a group represented by the following formula (2):



(2)

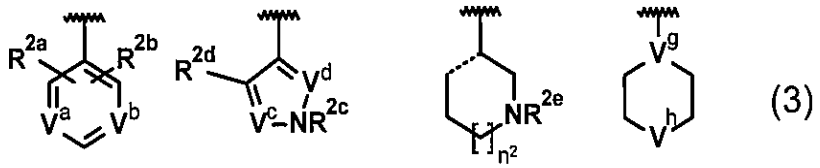
where in formula (2), W^a represents CH_2, an oxygen atom, or N-R^{1f}, W^b represents CH, a nitrogen atom, or C-OH, R^{1a}, R^{1b}, and R^{1c} each independently represent the same or different hydrogen atom, halogen atom, hydroxyl group, C1-C6 alkyl group optionally substituted with a halogen atom, amino group, or oxo group, and n represents 0, 1, or 2,

or -$NR^{1d}R^{1e}$;

R^{1d} and R^{1e} each independently represent the same or different hydrogen atom, C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a halogen atom or a 4- to 7-membered heterocyclic group, a 4- to 7-membered heterocyclic group, or a C3-C6 cycloalkyl group optionally substituted with a hydroxyl group;

R^{1f} represents a hydrogen atom, a C1-C6 alkyl group, or a C3-C6 cycloalkyl group;

R^2 represents a hydrogen atom, a C1-C6 alkyl group, a C3-C6 cycloalkyl group optionally substituted with a C1-C6 alkyl group, a 2,4-dimethylpyrazolyl group, or any group selected from the following formula (3):



(3)

where in formula (3), the broken line represents a single bond or a double bond, V^a represents C-R^{2f} or a nitrogen atom, V^b represents C-R^{2g} or a nitrogen atom, V^c represents C-R^{2j} or a nitrogen atom, V^d represents C-R^{2k} or a nitrogen atom, V^g represents CH or a nitrogen atom, V^h represents $CHN(CH_3)_2$, N-R^{2l}, or an oxygen atom, and n^2 represents 1 or 2,

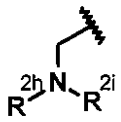
R^{2a} and R^{2b} each independently represent the same or different hydrogen atom, halogen atom, hydroxyl group, cyano group, C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a hydroxyl group, a halogen atom, or a 4- to 7-membered heterocyclic group, a C1-C6 alkoxy group, where the C1-C6 alkoxy group may be substituted with a halogen atom or deuterium, or a C3-C6 cycloalkyl group,

R^{2c} represents a C3-C6 cycloalkyl group or a C1-C6 alkyl group, where the C1-C6 alkyl group may be substituted with a C3-C6 cycloalkyl group or a halogen atom,

R^{2d} represents a hydrogen atom, a C1-C6 alkyl group optionally substituted with a halogen atom, a C1-C6 alkoxy group, or a C3-C6 cycloalkyl group,

R^{2e} represents a C1-C6 alkylsulfonyl group, a C3-C6 cycloalkylsulfonyl group, a benzenesulfonyl group, where the benzenesulfonyl group may be substituted with a C1-C6 alkyl group or a halogen atom, a C3-C6 cycloalkylcarbonyl group, a C1-C6 alkylcarbonyl group, or a benzoyl group, where the benzoyl group may be substituted with a C1-C6 alkyl group or a halogen atom,

R^{2f} and R^{2g} each independently represent the same or different hydrogen atom, halogen atom, C1-C6 alkoxy group optionally substituted with a halogen atom, or C1-C6 alkyl group optionally substituted with a hydroxyl group, or the following formula (4)



(4)

where in formula (4), R^{2h} and R^{2i} each independently represent the same or different C1-C6 alkyl group, or R^{2h} and R^{2i} may be bonded to each other to form a 4- to 7-membered heterocyclic group optionally substituted with a C1-C6 alkyl group,

R^{2j} and R^{2k} each independently represent the same or different hydrogen atom, C1-C6 alkyl group optionally substituted with a halogen atom, or C3-C6 cycloalkyl group, or

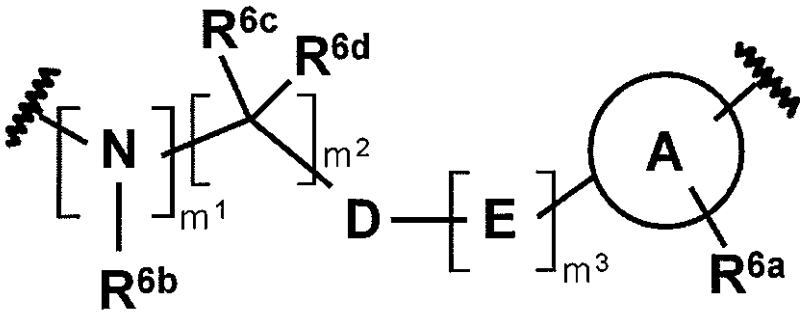
R^{2c} and R^{2k} may be bonded to each other to form a group shown below,



R^{2l} represents a C1-C6 alkyl group or a C3-C6 cycloalkyl group;

or alternatively, R^1 and R^2 may be bonded to each other to form a group represented by the following formula (5),

where the leftmost bond of each group represents the bond between the aromatic ring and R^1 of the compound represented by formula (1), and the rightmost bond represents the bond between the aromatic ring and R^2 of the compound represented by formula (1),



(5)

where in formula (5), A represents an aryl group, a heteroaryl group, or a 4- to 7-membered heterocyclic group, R^{6a} represents a hydrogen atom, a halogen atom, a C1-C6 alkyl group, a C3-C6 cycloalkyl group, or a C1-C6 alkoxy group, D represents $-NR^{6e}CO-$ or $-CONR^{6f}-$, E represents $-CR^{6g}R^{6h}-$, $-NR^{6i}-$, -O-, -S-, -SO-, or $-SO_2-$, and when there are a plurality of Es, the plurality of Es may be the same or different, R^{6b}, R^{6c}, R^{6d}, R^{6e}, R^{6f}, R^{6g}, R^{6h}, and R^{6i}

each independently represent a hydrogen atom, a C1-C6 alkyl group, or a C3-C6 cycloalkyl group, or R^{6b} and R^{6c}, R^{6b} and R^{6e}, or R^{6c} and R^{6d} may be bonded to each other to form a ring, m^1 represents 0 or 1, m^2 represents 1, 2, 3, 4, or 5, and m^3 represents 0, 1, 2, or 3;

R^3 represents a hydrogen atom, a halogen atom, a C1-C6 alkyl group, or a 1-methyl-3,6-dihydro-2H-pyrazin-5-yl group;

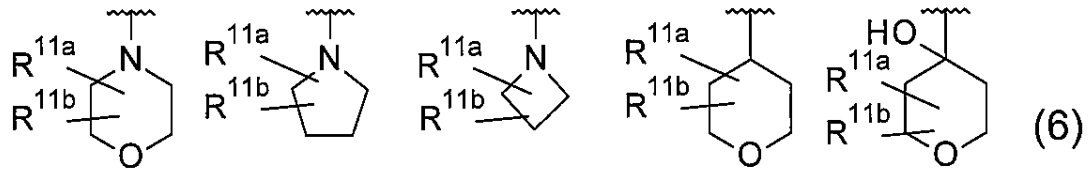
R^4 represents a hydrogen atom or a halogen atom;

X-Y represents C=CH or N-CH_2; and

Z represents a hydrogen atom, a halogen atom, a C1-C6 alkyl group optionally substituted with a halogen atom, a C1-C6 alkoxy group, a cyano group, or a C1-C6 alkoxycarbonyl group.

Claim 2

The compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein R^1 represents a hydrogen atom, a C1-C6 alkyl group, -$NR^{11d}R^{11e}$, or any group selected from the following formula (6):



(6)

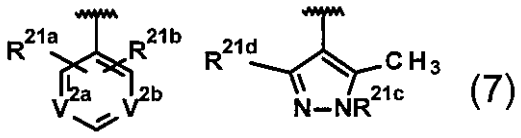
where in formula (6),

R^{11a} and R^{11b} each independently represent the same or different hydrogen atom, halogen atom, hydroxyl group, or C1-C6 alkyl group; and

R^{11d} and R^{11e} each independently represent the same or different hydrogen atom or C1-C6 alkyl group optionally substituted with a halogen atom.

Claim 3

The compound according to claim 1 or 2, or a pharmaceutically acceptable salt thereof, wherein R^2 represents a hydrogen atom, a C1-C6 alkyl group, a C3-C6 cycloalkyl group optionally substituted with a C1-C6 alkyl group, a 4-(dimethylamino)piperidin-1-yl group, or any group selected from the following formula (7):



(7)

where in formula (7),

V^{2a} represents C-R^{21e} or a nitrogen atom;

V^{2b} represents C-R^{21f} or a nitrogen atom;

R^{21a} and R^{21b} each independently represent the same or different hydrogen atom, halogen atom, hydroxyl group, C1-C6 alkyl group optionally substituted with a halogen atom, C1-C6 alkoxy group, where the C1-C6 alkoxy group may be substituted with a halogen atom or deuterium, or C3-C6 cycloalkyl group;

R^{21c} represents a C1-C6 alkyl group optionally substituted with a halogen atom;

R^{21d} represents a hydrogen atom or a C3-C6 cycloalkyl group;

R^{21e} represents a hydrogen atom or a halogen atom; and

R^{21f} represents a hydrogen atom or a halogen atom.

Claim 4

The compound according to any one of claims 1 to 3, or a pharmaceutically acceptable salt thereof, wherein

R^3 represents a hydrogen atom;

R^4 represents a hydrogen atom;

X-Y represents C=CH or N-CH_2; and

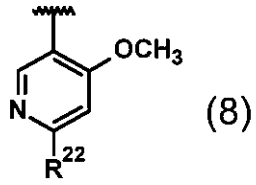
Z represents a halogen atom.

Claim 5

The compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein

R^1 represents any group selected from an ethyl group, a 2,2-difluoroethylamino group, or a [(2R)-1,1,1-trifluoropropan-2-yl]amino group;

R^2 represents a 2-methoxypyridin-3-yl group, a 1,5-dimethyl-1H-pyrazol-4-yl group, or a group represented by the following formula (8):



(8)

where in formula (8), R^{22} represents a C1-C6 alkyl group optionally substituted with a halogen atom, a C1-C6 alkoxy group optionally substituted with a halogen atom, or a C3-C6 cycloalkyl group;

R^3 represents a hydrogen atom;

R^4 represents a hydrogen atom;

X-Y represents C=CH or N-CH_2; and

Z represents a halogen atom.

Claim 6

The compound according to claim 1, or a pharmaceutically acceptable salt thereof, which is selected from the following compounds:

3-(6-chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one,

3-(6-chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-[4-methoxy-6-(trifluoromethyl)pyridin-3-yl]-1,6-naphthyridin-2(1H)-one,

3-(6-chloro-4-{[(2R)-1,1,1-trifluoropropan-2-yl]amino}-1H-imidazo[4,5-c]pyridin-2-yl)-5-(1,5-dimethyl-1H-pyrazol-4-yl)-1,6-naphthyridin-2(1H)-one,

3-(6-chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-[6-(1,1-difluoroethyl)-4-methoxypyridin-3-yl]-1,6-naphthyridin-2(1H)-one,

3-(6-chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-[6-(difluoromethoxy)-4-methoxypyridin-3-yl]-1,6-naphthyridin-2(1H)-one,

3-{6-chloro-4-[(2,2-difluoroethyl)amino]-1H-imidazo[4,5-c]pyridin-2-yl}-5-(2-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one, or

3-(6-chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-3,4-dihydropyrido[4,3-d]pyrimidin-2(1H)-one.

Claim 7

3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-

methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one, or a pharmaceutically acceptable salt thereof.

Claim 8

3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one 1,2-ethanedisulfonate.

Claim 9

3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one methanesulfonate.

Claim 10

3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one benzenesulfonate.

Claim 11

3-(6-Chloro-4-ethyl-1H-imidazo[4,5-c]pyridin-2-yl)-5-(6-cyclopropyl-4-methoxypyridin-3-yl)-1,6-naphthyridin-2(1H)-one adipate.

Claim 12

An SMG1 inhibitor comprising the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, as an active ingredient.

Claim 13

An NMD inhibitor comprising the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, as an active ingredient.

Claim 14

A pharmaceutical composition comprising the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, as an active ingredient, and optionally comprising a pharmaceutically acceptable carrier.

Claim 15

The pharmaceutical composition according to claim 14 for use in treating cancer.

Claim 16

The pharmaceutical composition according to claim 15, wherein the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, is to be administered in combination with an immune checkpoint inhibitor.

Claim 17

The pharmaceutical composition according to claim 16, wherein the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, and the immune checkpoint inhibitor are each contained as an active ingredient in different pharmaceutical formulations, and are to be administered simultaneously or at different times.

Claim 18

The pharmaceutical composition according to claim 16, wherein the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, and the immune checkpoint inhibitor are contained as active ingredients in a single pharmaceutical formulation.

Claim 19

The pharmaceutical composition according to any one of claims 16 to 18, wherein the immune checkpoint inhibitor is an anti-PD-1 antibody, an anti-PD-L1 antibody, or an anti-CTLA-4 antibody.

Claim 20

The pharmaceutical composition according to any one of claims 15 to 19, wherein the cancer is hematological cancer selected from the group consisting of leukemia, lymphoma, and multiple myeloma; sarcoma selected from the group consisting of osteosarcoma, chordoma, chondrosarcoma, and Ewing sarcoma; or solid cancer selected from the group consisting of gastric cancer, lung cancer, colorectal cancer, esophageal cancer, head and neck cancer, breast cancer, liver cancer, kidney cancer, tongue cancer, thyroid cancer, uterine cancer, ovarian cancer, prostate cancer, cervical cancer, pancreatic cancer, skin cancer, adrenal cancer, biliary tract cancer, thymic cancer, mesothelioma, bladder cancer, and brain tumor.

Claim 21

An anticancer agent comprising the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, as an active ingredient.

Claim 22

The compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, for use in treating cancer.

Claim 23

The compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, for use in treating cancer, which is to be administered in combination with an immune checkpoint inhibitor.

Claim 24

The compound for use according to claim 23, or a pharmaceutically acceptable salt thereof, wherein the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, and the immune checkpoint inhibitor are each contained as an active ingredient in different pharmaceutical formulations, and are to be administered simultaneously or at different times.

Claim 25

The compound for use according to claim 23, or a pharmaceutically acceptable salt thereof, wherein the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, and the immune checkpoint inhibitor are contained as active ingredients in a single pharmaceutical formulation and are to be administered.

Claim 26

The compound for use according to any one of claims 23 to 25, or a pharmaceutically acceptable salt thereof, wherein the immune checkpoint inhibitor is an anti-PD-1 antibody, an anti-PD-L1 antibody, or an anti-CTLA-4 antibody.

Claim 27

The compound for use according to any one of claims 23 to 26, or a pharmaceutically acceptable salt thereof, wherein the cancer is hematological cancer selected from the group consisting of leukemia, lymphoma, and multiple myeloma; sarcoma selected from the group consisting of osteosarcoma, chordoma, chondrosarcoma, and Ewing sarcoma; or solid cancer selected from the group consisting of gastric cancer, lung cancer, colorectal cancer, esophageal cancer, head and neck cancer, breast cancer, liver cancer, kidney cancer, tongue cancer, thyroid cancer, uterine cancer, ovarian cancer, prostate cancer, cervical cancer, pancreatic cancer, skin cancer, adrenal cancer, biliary tract cancer, thymic cancer, mesothelioma, bladder cancer, and brain tumor.

Claim 28

Use of the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for the treatment of cancer.

Claim 29

The use according to claim 28, wherein the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, is to be administered in combination with an immune checkpoint inhibitor.

Claim 30

The use according to claim 29, wherein the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, and the immune checkpoint inhibitor are each contained as an active ingredient in different pharmaceutical formulations, and are to be administered simultaneously or at different times.

Claim 31

The use according to claim 29, wherein the compound according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, and the immune checkpoint inhibitor are contained as active ingredients in a single pharmaceutical formulation and are to be administered.

Claim 32

The use according to any one of claims 28 to 31, wherein the immune checkpoint inhibitor is an anti-PD-1 antibody, an anti-PD-L1 antibody, or an anti-CTLA-4 antibody.

Claim 33

The use according to any one of claims 28 to 32, wherein the cancer is hematological cancer selected from the group consisting of leukemia, lymphoma, and multiple myeloma; sarcoma selected from the group consisting of osteosarcoma, chordoma, chondrosarcoma, and Ewing sarcoma; or solid cancer selected from the group consisting of gastric cancer, lung cancer, colorectal cancer, esophageal cancer, head and neck cancer, breast cancer, liver cancer, kidney cancer, tongue cancer, thyroid cancer, uterine cancer, ovarian cancer, prostate cancer, cervical cancer, pancreatic cancer, skin cancer, adrenal cancer, biliary tract cancer, thymic cancer, mesothelioma, bladder cancer, and brain tumor.