

[12] An inhibitor against at least two kinases selected from the group consisting of Akt, Rsk, and S6K comprising, as an active ingredient, the compound or the salt thereof according to any of [1] to [8].

[13] An inhibitor against Akt, Rsk, and S6K comprising, as an active ingredient, the compound or the salt thereof according to any of [1] to [8].

[14] A pharmaceutical composition for the treatment of a disease associated with Akt comprising, as an active ingredient, the compound or the salt thereof according to any of [1] to [8].

[15] A pharmaceutical composition for the treatment of a disease associated with Rsk comprising, as an active ingredient, the compound or the salt thereof according to any of [1] to [8].

[16] A pharmaceutical composition for the treatment of a disease associated with S6K comprising, as an active ingredient, the compound or the salt thereof according to any of [1] to [8].

[17] A pharmaceutical composition for the treatment of a disease associated with at least two kinases selected from the group consisting of Akt, Rsk, and S6K comprising, as an active ingredient, the compound or the salt thereof according to any of [1] to [8].

[18] A pharmaceutical composition for the treatment of a disease associated with Akt, Rsk, and S6K comprising, as an active ingredient, the compound or the salt thereof according to any of [1] to [8].

[18-1] A pharmaceutical composition for use in the treatment of a tumor comprising, as an active ingredient, the compound or the salt thereof according to any one of [1] to [8].

[19] An anti-tumor agent comprising, as an active ingredient, the compound or the salt thereof according to any of [1] to [8].

[0017]

The present invention further encompasses the following.

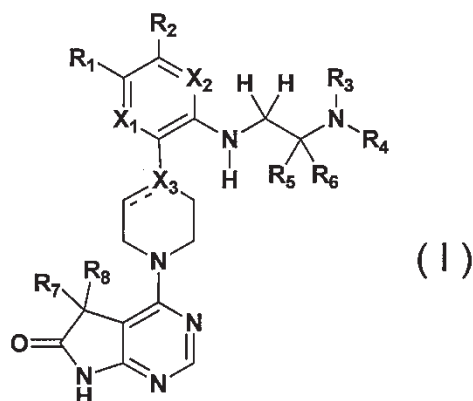
[20-1] The compound or the salt thereof according to any of [1] to [8] for use in the inhibition of Akt.

[20-2] The compound or the salt thereof according to any of [1] to [8] for use in the inhibition of Rsk.

[20-3] The compound or the salt thereof according to any of [1] to [8] for use in the inhibition of S6K.

CLAIMS

[Claim 1] A compound represented by Formula (I) or a salt thereof:



5 wherein

R₁ represents an optionally substituted 4- to 6-membered monocyclic unsaturated heterocyclic group having 1 to 3 hetero atoms selected from among N, S, and O;

R₂ represents a hydrogen atom, a halogen atom, a hydroxyl group, an amino group, a cyano group, a nitro group, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C2-C6 alkenyl group, a C2-C6 alkynyl group, or a C3-C6 cycloalkyl group;

R₃, R₄, and R₅, which may be the same or different, each represent a hydrogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, or a C3-C6 cycloalkyl group; or R₃ and R₄, together with a nitrogen atom to which they are bound, form a 4- to 6-membered monocyclic saturated heterocycle having 1 to 3 hetero atoms selected from among N, S, and O, and R₅ represents a hydrogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, or a C3-C6 cycloalkyl group; or R₄ and R₅, together with a nitrogen atom to which they are bound and a carbon atom adjacent thereto, form a 4- to 6-membered monocyclic saturated heterocycle having 1 to 3 hetero atoms selected from among N, S, and O, and R₃ represents a hydrogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, or a C3-C6 cycloalkyl group;

R₆ represents a hydrogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, or a C3-C6 cycloalkyl group;

R₇ and R₈, which may be the same or different, each represent a hydrogen atom, a halogen atom, a hydroxyl group, an amino group, a cyano group, a nitro group, a C1-C6 alkyl

group, a C1-C6 haloalkyl group, a C2-C6 alkenyl group, a C2-C6 alkynyl group, or a C3-C6 cycloalkyl group; or R₇ and R₈, together with a carbon atom to which they are bound, form a C3-C10 cycloalkyl group;

X₁ and X₂, which may be the same or different, each represent N or CR₉, and R₉ represents a hydrogen atom, a halogen atom, a hydroxyl group, an amino group, a cyano group, a nitro group, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C2-C6 alkenyl group, a C2-C6 alkynyl group, or a C3-C6 cycloalkyl group; and

X₃ represents N or CH when a broken line (-----) indicates a single bond, or C when a broken line indicates a double bond, provided that at least either one of X₁ or X₂ represents N.

[Claim 2] The compound or the salt thereof according to claim 1, wherein R₁ represents a 4- to 6-membered monocyclic unsaturated heterocyclic group having 1 to 3 hetero atoms selected from among N, S, and O, which may comprise 1 to 3 substituents selected from among a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, and a C3-C10 cycloalkyl group.

[Claim 3] The compound or the salt thereof according to claim 1 or 2, wherein R₂ represents a hydrogen atom or a halogen atom, R₆ represents a hydrogen atom, R₇ represents a C1-C6 alkyl group, R₈ represents a hydrogen atom or a C1-C6 alkyl group, X₁ represents N or CR₉, R₉ represents a hydrogen atom or a halogen atom, and X₂ represents N or CH.

[Claim 4] The compound or the salt thereof according to any one of claims 1 to 3, wherein R₁ represents a furanyl group, a thienyl group, a thiazolyl group, a thiadiazolyl group, an oxazolyl group, an oxadiazolyl group, a pyridinyl group, or a pyrazolyl group, which may comprise 1 to 3 substituents selected from among a halogen atom, a C1-C6 alkyl group, a C1-C6 haloalkyl group, a C1-C6 alkoxy group, and a C3-C10 cycloalkyl group.

[Claim 5] The compound or the salt thereof according to any one of claims 1 to 4, wherein R₃, R₄, and R₅, which may be the same or different, each represent a hydrogen atom

or a C1-C6 alkyl group; or R₃ and R₄, together with a nitrogen atom to which they are bound, form a 4- to 6-membered monocyclic saturated heterocycle having a nitrogen atom, and R₅ represents a hydrogen atom or a C1-C6 alkyl group; or R₄ and R₅, together with a nitrogen atom to which they are bound and a carbon atom adjacent thereto, form a 4- to 6-membered
5 monocyclic saturated heterocycle having a nitrogen atom, and R₃ represents a hydrogen atom or a C1-C6 alkyl group.

[Claim 6] The compound or the salt thereof according to any one of claims 1 to 5, wherein R₁ represents a pyridinyl group having a halogen atom or a C1-C6 alkoxy group, a
10 pyrazolyl group having a C1-C6 alkyl group and a C1-C6 haloalkyl group, an oxadiazolyl group having a C1-C6 haloalkyl group, or an unsubstituted furanyl group or thiazolyl group,

R₂, R₅ and R₆ each represent a hydrogen atom,

R₃ represents a hydrogen atom, and R₄ represents a C1-C6 alkyl group; or R₃ and R₄, together with a nitrogen atom to which they are bound, form a 4- to 6-membered monocyclic
15 saturated heterocycle having a nitrogen atom,

R₇ represents a C1-C6 alkyl group, R₈ represents a hydrogen atom or a C1-C6 alkyl group, and

X₁ and X₂, which may be different from each other, each represent N or CH; and

a broken line (-----) indicates a single bond and X₃ represents CH.

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[Claim 7] The compound or the salt thereof according to claim 6, wherein R₁ represents a pyrazolyl group having a C1-C6 alkyl group and a C1-C6 haloalkyl group, or an oxadiazolyl group having a C1-C6 haloalkyl group.

25 [Claim 8] The compound or the salt thereof according to any one of claims 1 to 7, wherein the compound is selected from the compounds indicated below:

4-(4-(6-(5-(difluoromethyl)-1,3,4-oxadiazol-2-yl)-3-((2-(pyrrolidin-1-yl)ethyl)amino)pyridin-2-yl)piperidin-1-yl)-5,5-dimethyl-5H-pyrrolo[2,3-d]pyrimidin-6(7H)-one;

4-(4-(3-((2-(tert-butylamino)ethyl)amino)-6-(5-(trifluoromethyl)-1,3,4-oxadiazol-2-yl)pyridin-2-yl)piperidin-1-yl)-5,5-dimethyl-5H-pyrrolo[2,3-d]pyrimidin-6(7H)-one; and

4-(4-(3-((2-(tert-butylamino)ethyl)amino)-6-(5-(difluoromethyl)-1,2,4-oxadiazol-3-yl)pyridin-2-yl)piperidin-1-yl)-5,5-dimethyl-5H-pyrrolo[2,3-d]pyrimidin-6(7H)-one.

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[Claim 9] An anti-tumor agent comprising, as an active ingredient, the compound or the salt thereof according to any one of claims 1 to 8.

10 [Claim 10] Use of the compound or the salt thereof according to any one of claims 1 to 8 in the manufacture of a medicament for the treatment of a tumor associated with Akt kinase, Rsk kinase or S6K kinase.

15 [Claim 11] A pharmaceutical composition for use in the treatment of a tumor comprising, as an active ingredient, the compound or the salt thereof according to any one of claims 1 to 8.