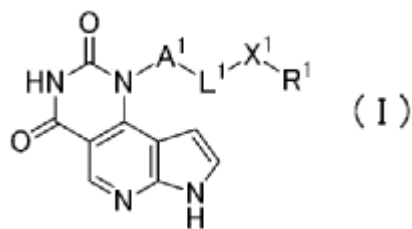


CLAIMS

1. A compound represented by the formula (I):



wherein A¹ is a C₃₋₇ cycloalkylene group,

- 5 L¹ is a C₁₋₆ alkylene group,

X¹ is O or NH, and

when X¹ is O, R¹ is a C₁₋₆ haloalkyl group, a cyano C₁₋₆ haloalkyl group or a cyano C₁₋₆ alkyl group, and

- 10 when X¹ is NH, R¹ is a cyano C₁₋₄ haloalkyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

2. The compound according to Claim 1, wherein L¹ is a methylene group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

3. The compound according to Claim 1 or 2, wherein A¹ is a cyclohexanediyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

- 15 4. The compound according to any one of Claims 1 to 3, wherein X¹ is O, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

5. The compound according to Claim 4, wherein R¹ is a C₁₋₄ haloalkyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

- 20 6. The compound according to Claim 4, wherein R¹ is a 3,3,3-trifluoropropyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

7. 1-{trans-4-[(3,3,3-Trifluoropropoxy)methyl]cyclohexyl}-1H-pyrrolo[3',2':5,6]pyrido[4,3-d]pyrimidine-2,4(3H,7H)-dione, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

- 25 8. The compound according to any one of Claims 1 to 3, wherein X¹ is NH, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

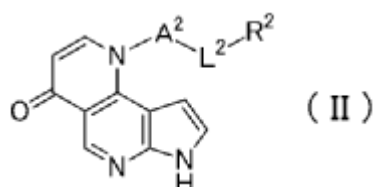
9. The compound according to Claim 8, wherein R¹ is a 3-cyano-1,1,1-trifluoropropan-2-yl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

10. 3-({[trans-4-(2,4-Dioxo-2,3,4,7-tetrahydro-1H-pyrrolo[3',2':5,6]pyrido[4,3-

d]pyrimidin-1-yl)cyclohexyl)methyl}amino)-4,4,4-trifluorobutanenitrile, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

11. (R)-3-([trans-4-(2,4-Dioxo-2,3,4,7-tetrahydro-1H-pyrrolo[3',2':5,6]pyrido[4,3-d]pyrimidin-1-yl)cyclohexyl)methyl}amino)-4,4,4-trifluorobutanenitrile, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

12. A compound represented by the formula (II):



wherein A^2 is a C_{3-7} cycloalkylene group,

L^2 is a C_{1-6} alkylene group, and

R^2 is a 5 to 10-membered aromatic heterocyclic group, wherein the heterocyclic group may be substituted with one or two identical or different substituents independently selected from the group consisting of halogen atoms, C_{1-4} alkyl groups and C_{1-4} haloalkyl groups, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

13. The compound according to Claim 12, wherein L^2 is a methylene group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

14. The compound according to Claim 12 or 13, wherein A^2 is a cyclohexanediyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

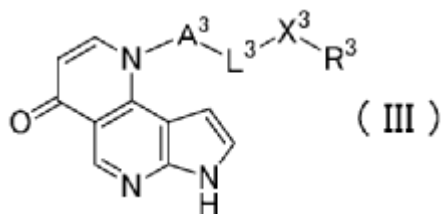
15. The compound according to any one of Claims 12 to 14, wherein R^2 is a 5 to 6-membered nitrogen-containing aromatic heterocyclic group, wherein the heterocyclic group may be substituted with one or two identical or different substituents independently selected from the group consisting of halogen atoms, methyl groups and trifluoromethyl groups, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

16. The compound according to any one of Claims 12 to 15, wherein R^2 is a pyrazolyl group, wherein the pyrazolyl group may be substituted with one or two identical or different substituents independently selected from the group consisting of halogen atoms, methyl groups and trifluoromethyl groups, a tautomer or pharmaceutically

acceptable salt of the compound or a solvate thereof.

17. 1-{trans-4-[(4-Methyl-1H-pyrazol-1-yl)methyl]cyclohexyl}-1H-pyrrolo[2,3-h][1,6]naphthyridin-4(7H)-one, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

5 18. A compound represented by the formula (III):



wherein A³ is a C₃₋₇ cycloalkylene group,

L³ is a C₁₋₆ alkylene group,

X³ is O or NH, and

10 when X³ is O, R³ is a C₁₋₆ haloalkyl group, a cyano C₁₋₆ haloalkyl group or a cyano C₁₋₆ alkyl group, and

when X³ is NH, R³ is a cyano C₁₋₆ haloalkyl group or a cyano C₁₋₆ alkyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

15 19. The compound according to Claim 18, wherein L³ is a methylene group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

20. The compound according to Claim 18 or 19, wherein A³ is a cyclohexanediyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

20 21. The compound according to any one of Claims 18 to 20, wherein X³ is O, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

22. The compound according to Claim 21, wherein R³ is a C₁₋₄ haloalkyl group or a cyano C₁₋₄ haloalkyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

25 23. The compound according to Claim 21, wherein R³ is a 2,2,2-trifluoroethyl group or a 3,3,3-trifluoropropyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

24. The compound according to Claim 21, wherein R³ is a 3-cyano-1,1,1-trifluoropropan-2-yl group or a 2-cyano-1,1,1-trifluoropropan-2-yl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.

25. 1-{trans-4-[(2,2,2-Trifluoroethoxy)methyl]cyclohexyl}-1H-pyrrolo[2,3-h][1,6]naphthyridin-4(7H)-one, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
26. 1-{trans-4-[(3,3,3-Trifluoropropoxy)methyl]cyclohexyl}-1H-pyrrolo[2,3-h][1,6]naphthyridin-4(7H)-one, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
27. 4,4,4-Trifluoro-3-{{trans-4-(4-oxo-4,7-dihydro-1H-pyrrolo[2,3-h][1,6]naphthyridin-1-yl)cyclohexyl}methoxy}butanenitrile, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
28. (R)-4,4,4-Trifluoro-3-{{trans-4-(4-oxo-4,7-dihydro-1H-pyrrolo[2,3-h][1,6]naphthyridin-1-yl)cyclohexyl}methoxy}butanenitrile, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
29. The compound according to any one of Claims 18 to 20, wherein X³ is NH, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
30. The compound according to Claim 29, wherein R³ is a cyano C₁₋₄ haloalkyl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
31. The compound according to Claim 29, wherein R³ is a 3-cyano-1,1,1-trifluoropropan-2-yl group, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
32. 4,4,4-Trifluoro-3-({[trans-4-(4-oxo-4,7-dihydro-1H-pyrrolo[2,3-h][1,6]naphthyridin-1-yl)cyclohexyl]methyl}amino)butanenitrile, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
33. (R)-4,4,4-Trifluoro-3-({[trans-4-(4-oxo-4,7-dihydro-1H-pyrrolo[2,3-h][1,6]naphthyridin-1-yl)cyclohexyl]methyl}amino)butanenitrile, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof.
34. A JAK inhibitor containing the compound as defined in any one of Claims 1 to 33, a tautomer or a pharmaceutically acceptable salt of the compound or a solvate thereof, as an active ingredient.
35. Use of a compound as defined in any one of Claims 1 to 33, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof, in the manufacture of a medicament for the prevention or treatment of rheumatoid arthritis, psoriasis, atopic dermatitis, contact dermatitis, eczematoid dermatitis, seborrheic

- dermatitis, lichen planus, pemphigus, pemphigoid, epidermolysis bullosa, hives, angioedema, angitis, erythema, dermal eosinophilia, lupus erythematosus, acne and alopecia areata, immune-mediated dermatoses, reversible airway obstruction, mucitis, angitis, asthma, Alzheimer disease, atherosclerosis, cancer, leukemia, rejection of the
- 5 following organ or tissue grafts: heart, kidney, liver, bone marrow, skin, horn, lung, pancreas, islet, small intestine, extremities, muscles, nerves, intervertebral disks, trachea, myoblasts and cartilage; the following graft-versus-host reaction after bone marrow transplantation and autoimmune diseases: rheumatic disease, systemic lupus erythematosus (SLE), Hashimoto's disease, multiple sclerosis, myasthenia gravis, type I
- 10 diabetes and diabetic complications; chronic myeloproliferative disorders and myelodysplastic syndrome against which inhibition of JAK is effective.
36. Use of a compound as defined in any one of Claims 1 to 33, a tautomer or pharmaceutically acceptable salt of the compound or a solvate thereof, in the manufacture of a medicament for the treatment of rheumatoid arthritis.
- 15 37. A compound as defined in any one of Claims 1 to 33, a tautomer or a pharmaceutically acceptable salt of the compound or a solvate thereof, as an active ingredient for use as a medicament.