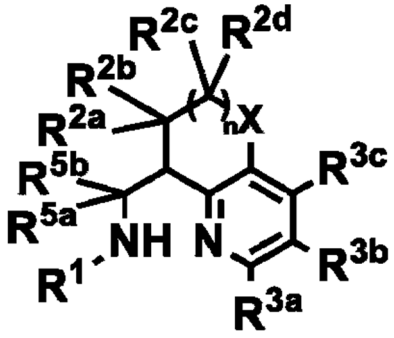
[CLAIMS]

[Claim 1]

A compound represented by formula I

[Chemical Formula 1]



I

or a pharmaceutically acceptable salt thereof,

wherein

X is an oxygen atom, a sulfur atom, NR, or CR'R",

n is 0 or 1,

R^1 is a hydrogen atom, optionally substituted C_{1-6} alkyl, or optionally substituted C_{3-6} alkenyl,

R^{2a}, R^{2b}, R^{2c}, R^{2d}, R, R', and R" are each independently a hydrogen atom, a halogen atom, optionally substituted C_{1-6} alkyl, or optionally substituted C_{6-10} aryl, or two of R^{2a}, R^{2b}, R^{2c}, R^{2d}, R, R', and R", together with a carbon atom or a nitrogen atom to which they are attached, form a 3- to 6-membered saturated carbocyclic ring or saturated heterocyclic ring,

R^{3a}, R^{3b}, and R^{3c} are each independently a hydrogen atom, optionally substituted C_{1-6} alkyl, a halogen atom, $-OR^4$, or optionally substituted C_{6-10} aryl,

R^4 is optionally substituted C_{1-6} alkyl or optionally substituted 3- to 6-membered saturated carbocyclic ring, and

R^{5a} and R^{5b} are each independently a hydrogen atom or optionally substituted C_{1-6} alkyl, or R^{5a} and R^{5b}, together with a carbon atom to which they are attached, form a 3- to 6-membered saturated carbocyclic ring,

wherein,

the optionally substituted C_{1-6} alkyl and optionally substituted C_{3-6} alkenyl are optionally substituted with a halogen atom, hydroxy, or C_{1-6} alkoxy, and

the optionally substituted C_{6-10} aryl and optionally substituted 3- to 6-membered saturated carbocyclic ring are optionally substituted with a halogen atom, hydroxy, C_{1-6} alkyl, or C_{1-6} alkoxy,

provided that the following (1) to (20) are excluded:

(1) a compound wherein n is 0, X is an oxygen atom, and R^{2a} and R^{2b} are hydrogen atoms;

(2) a compound wherein n is 1, X is an oxygen atom, and R^{2a}, R^{2b}, R^{2c}, R^{2d}, R^{3a}, R^{3b}, and R^{3c} are hydrogen atoms;

(3) a compound wherein n is 1, X is CH_2, R^1, R^{2a}, R^{2b}, R^{2c}, R^{2d}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{3a} is a hydrogen atom or CH_3;

(4) a compound wherein n is 1, X is an oxygen atom, R^1, R^{2a}, R^{2b}, R^{2c}, R^{2d}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{3a} is CH_3;

(5) a compound wherein n is 1, X is an oxygen atom, R^1, R^{2a}, R^{2b}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{2c} and R^{2d} are CH_3;

(6) a compound wherein n is 1, X is an oxygen atom, R^1, R^{2a}, R^{2b}, R^{2c}, R^{2d}, R^{3a}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{3b} is CH_3;

(7) a compound wherein n is 1, X is an oxygen atom, R^1, R^{2a}, R^{2b}, R^{2d}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{2c} is CH_3;

(8) a compound wherein n is 0, X is CH_2, R^1, R^{2a}, R^{2b}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{3a} is CH_3;

(9) a compound wherein n is 1, X is CH_2, R^1, R^{2a}, R^{2b}, R^{2d}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{2c} is CH_3;

(10) a compound wherein n is 1, X is CH_2, R^1, R^{2a}, R^{2b}, R^{2c}, R^{2d}, R^{3a}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{3b} is CH_3 and a bromine atom;

(11) a compound wherein n is 1, X is an oxygen atom, R^1, R^{2a}, R^{2b}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{2c} and R^{2d}, together with a carbon atom to which they are attached, form a cyclobutyl ring;

(12) a compound wherein n is 1, X is an oxygen atom, R^{2a}, R^{2b}, R^{2c}, R^{2d}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^1 is CH_3;

(13) a compound wherein n is 0, X is CH_2, R^{2a}, R^{2b}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^1 is a hydrogen atom, optionally substituted C_{1-6} alkyl, or optionally substituted C_{3-6} alkenyl;

(14) a compound wherein n is 1, X is CH_2, R^{2a}, R^{2b}, R^{2c}, R^{2d}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^1 is a hydrogen atom, optionally substituted C_{1-6} alkyl, or optionally substituted C_{3-6} alkenyl;

(15) a compound wherein n is 0, X is CH_2, R^{2a}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, R^{2b} is a hydrogen atom and CH_3, and R^1 is a hydrogen atom and CH_3;

(16) a compound wherein n is 1, X is CH_2, R^{2c}, R^{2d}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, R^{2a} and/or R^{2b} is CH_3, and R^1 is a hydrogen atom and CH_3;

(17) a compound wherein n is 1, X is CH_2, R^{2c}, R^{2d}, R^{3a}, R^{3b}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, R^{2a} and R^{2b}, together with a carbon atom, form cyclopropane, and R^1 is a hydrogen atom and CH_3;

(18) a compound wherein n is 0 or 1, X is CH_2, and R^{5a} or R^{5b} is optionally substituted C_{1-6} alkyl;

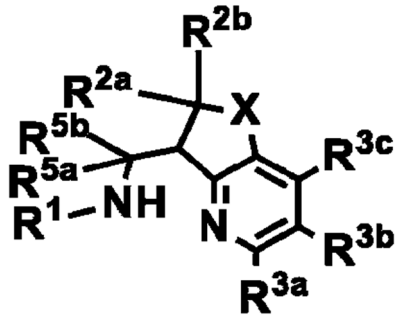
(19) a compound wherein n is 0, X is CH_2, R^1, R^{2a}, R^{2b}, R^{3a}, R^{3c}, R^{5a}, and R^{5b} are hydrogen atoms, and R^{3b} is a bromine atom; and

(20) a compound wherein n is 0 or 1, X is CH_2, R^{2a}, R^{2b}, R^{3a}, R^{3b}, R^{3c} are hydrogen atoms, R^{5a} and R^{5b} are 4-6 membered saturated carbon rings formed with the carbon atom to which they bond, and R^1 is a hydrogen atom.

[Claim 2]

The compound or the pharmaceutically acceptable salt thereof of claim 1, represented by the following formula:

[Chemical Formula 2]



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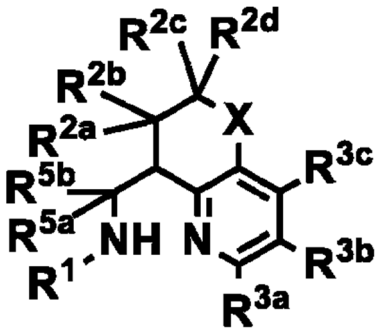
[Claim 3]

The compound or the pharmaceutically acceptable salt thereof of claim 1, represented by the following formula:

[Chemical Formula 3]



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[Claim 4]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein R^1 is a hydrogen atom, or C_{1-6} alkyl optionally substituted with a halogen atom.

[Claim 5]

The compound or the pharmaceutically acceptable salt thereof of claim 4, wherein R^1 is methyl.

[Claim 6]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein R^{2a} and R^{2b} are each independently hydrogen atoms, optionally substituted C_{1-6} alkyl, or R^{2a} and R^{2b}, together with a carbon atom to which they are attached, form a 3- to 6-membered saturated carbocyclic ring.

[Claim 7]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein R^{2a} is a hydrogen atom, and R^{2b} is optionally substituted C_{1-6} alkyl.

[Claim 8]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein X is CR'R", and R' and R" are each independently hydrogen atoms, or optionally substituted C_{1-6} alkyl.

[Claim 9]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 and 3, wherein n is 1, and R^{2c} and R^{2d} are each independently hydrogen atoms, optionally substituted C_{1-6} alkyl, or R^{2c} and R^{2d}, together with a carbon atom to which they are attached, form a 3- to 6-membered saturated carbocyclic ring.

[Claim 10]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein R^{3a}, R^{3b}, and R^{3c} are each independently a hydrogen atom, optionally substituted C_{1-6} alkyl, or a halogen atom.

[Claim 11]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein R^{3a}, R^{3b}, and R^{3c} are each a hydrogen atom.

[Claim 12]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein at least one of R^{3a}, R^{3b}, and R^{3c} is optionally substituted C_{1-6} alkyl or a halogen atom.

[Claim 13]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein R^{5a} and R^{5b} are each independently a hydrogen atom or optionally substituted C_{1-6} alkyl.

[Claim 14]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein R^{5a} and R^{5b} are each a hydrogen atom.

[Claim 15]

The compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, wherein X is an oxygen atom.

[Claim 16]

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

R^1 is C_{1-6} alkyl optionally substituted with a halogen atom, and

at least one of R^{3a}, R^{3b}, and R^{3c} is optionally substituted C_{1-6} alkyl or a halogen atom.

[Claim 17]

The compound or the pharmaceutically acceptable salt thereof of claim 16, wherein

R^1 is methyl, and

at least one of R^{3a}, R^{3b}, and R^{3c} is methyl, a fluorine atom, or a chlorine atom.

[Claim 18]

The compound or the pharmaceutically acceptable salt thereof of claim 1, wherein

X is an oxygen atom,

n is 0,

R^1 is C_{1-6} alkyl optionally substituted with a halogen atom,

R^{2a} is a hydrogen atom, and R^{2b} is optionally substituted C_{1-6} alkyl,

at least one of R^{3a}, R^{3b}, and R^{3c} is optionally substituted C_{1-6} alkyl or a halogen atom, and

R^{5a} and R^{5b} are each a hydrogen atom.

[Claim 19]

The compound or the pharmaceutically acceptable salt thereof of claim 1, selected from the following group of compounds:

1-[(2R,3S)-6-fluoro-2-methyl-2,3-dihydrofuro[3,2-b]pyridin-3-yl]methanamine;

1-[(2R,3S)-2-methyl-2,3-dihydrofuro[3,2-b]pyridin-3-yl]methanamine;

N-methyl-1-[(2R,3S)-2-methyl-2,3-dihydrofuro[3,2-b]pyridin-3-yl]methanamine;

1-[(2R,3S)-6-fluoro-2-methyl-2,3-dihydrofuro[3,2-b]pyridin-3-yl]-N-methylmethanamine;

1-[(2R,3S)-6-fluoro-2-methyl-2,3-dihydrofuro[3,2-b]pyridin-3-yl]-N-($^2H_3$)methylmethanamine;

rel-1-[(3'S)-5'-methyl-3'H-spiro[cyclopropane-1,2'-furo[3,2-b]pyridin]-3'-yl]methanamine;

rel-1-[(3'S)-5'-fluoro-3'H-spiro[cyclopropane-1,2'-furo[3,2-b]pyridin]-3'-yl]methanamine;

rel-1-[(3S)-2,2,5-trimethyl-2,3-dihydrofuro[3,2-b]pyridin-3-yl]methanamine;

rel-1-[(3'S)-3'H-spiro[cyclopropane-1,2'-furo[3,2-b]pyridin]-3'-yl]methanamine; and

rac-1-(5-fluoro-2,2-dimethyl-2,3-dihydrofuro[3,2-b]pyridin-3-yl)methanamine.

[Claim 20]

Use of the compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, and 19 in modulation of a TAAR1 receptor.

[Claim 21]

A therapeutic agent for use in the treatment of a psychiatric disease or central nervous system disease comprising the compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, and 19 as an active ingredient.

[Claim 22]

Use of the compound or the pharmaceutically acceptable salt thereof of any one of claims 1 to 3, and 19 for the manufacture of a therapeutic agent for the treatment of a psychiatric disease or central nervous system disease.

[Claim 23]

The therapeutic agent for the use of claim 21 or the use of claim 22, wherein the psychiatric disease or central nervous system disease is depression, schizophrenia, a positive symptom of schizophrenia, a negative symptom of schizophrenia, a bipolar disorder with a psychiatric characteristic, a depressive disorder with a psychiatric characteristic, a psychotic symptom associated with dementia, a psychotic symptom associated with

Alzheimer's disease, a psychotic symptom associated with Lewy body dementia, a psychotic symptom associated with Parkinsonian dementia, a psychotic symptom associated with Parkinson's disease, or irritation, agitation, or aggression associated with Alzheimer's disease.