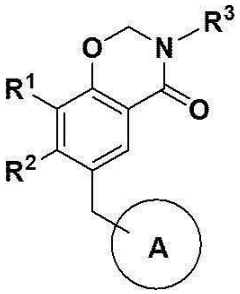
## CLAIMS

1. A compound represented by the formula



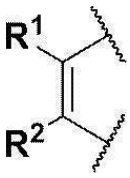
(I)

wherein

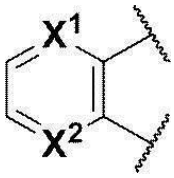
$R^1$ is a hydrogen atom, a halogen atom or a $C_{1-6}$ alkyl group;

$R^2$ is a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group or a $C_{1-6}$ alkoxy group; or

a partial structure:



is optionally



(wherein $X^1$ and $X^2$ are each CH);

$R^3$ is

(1) a $C_{3-10}$ cycloalkyl group optionally substituted by 1 to 3 hydroxy groups or

(2) a 3- to 14-membered non-aromatic heterocyclic group optionally substituted by 1 to 3 hydroxy groups; and

ring A is a $C_{6-14}$ aromatic hydrocarbon ring, a 3- to 14-membered non-aromatic heterocycle or a 5- to 14-membered aromatic heterocycle, each of which is optionally further substituted by 1 to 5 substituents selected from

(i) a halogen atom,

(ii) a cyano group,
(iii) a $C_{1-6}$ alkyl group,
(iv) a $C_{1-6}$ alkoxy group and
(v) a 5- to 14-membered aromatic heterocyclic group optionally substituted by 1 to 3 $C_{1-6}$ alkyl groups,
or a salt thereof.

2. The compound according to claim 1, wherein $R^1$ is a hydrogen atom, a halogen atom or a $C_{1-6}$ alkyl group;

$R^2$ is a $C_{1-6}$ alkyl group, a $C_{2-6}$ alkenyl group or a $C_{1-6}$ alkoxy group;

$R^3$ is

(1) a $C_{3-10}$ cycloalkyl group optionally substituted by 1 to 3 hydroxy groups or
(2) a 3- to 14-membered non-aromatic heterocyclic group optionally substituted by 1 to 3 hydroxy groups; and

ring A is a $C_{6-14}$ aromatic hydrocarbon ring, a 3- to 14-membered non-aromatic heterocycle or a 5- to 14-membered aromatic heterocycle, each of which is optionally further substituted by 1 to 5 substituents selected from
(i) a halogen atom,
(ii) a cyano group,
(iii) a $C_{1-6}$ alkyl group,
(iv) a $C_{1-6}$ alkoxy group and
(v) a 5- to 14-membered aromatic heterocyclic group optionally substituted by 1 to 3 $C_{1-6}$ alkyl groups,
or a salt thereof.

3. The compound according to claim 1, wherein $R^1$ is a hydrogen atom or a halogen atom;

$R^2$ is a $C_{1-6}$ alkyl group;

$R^3$ is

(1) a $C_{3-10}$ cycloalkyl group optionally substituted by 1 to 3 hydroxy groups or
(2) a 3- to 14-membered non-aromatic heterocyclic group

optionally substituted by 1 to 3 hydroxy groups; and

ring A is a $C_{6-14}$ aromatic hydrocarbon ring or a 5- to 14-membered aromatic heterocycle, each of which is optionally further substituted by 1 to 5 substituents selected from

(i) a halogen atom,

(ii) a $C_{1-6}$ alkyl group and

(iii) a 5- to 14-membered aromatic heterocyclic group optionally substituted by 1 to 3 $C_{1-6}$ alkyl groups,

or a salt thereof.

4. 8-Fluoro-3-((1S,2S)-2-hydroxycyclopentyl)-7-methyl-6-((6-(1H-pyrazol-1-yl)pyridin-3-yl)methyl)-2,3-dihydro-4H-1,3-benzoxazin-4-one, or a salt thereof.

5. 8-Chloro-6-((6-chloropyridin-3-yl)methyl)-3-((1S,2S)-2-hydroxycyclopentyl)-7-methyl-2,3-dihydro-4H-1,3-benzoxazin-4-one, or a salt thereof.

6. 3-(trans-2-Hydroxycyclohexyl)-7-methyl-6-((6-methylpyridin-3-yl)methyl)-2,3-dihydro-4H-1,3-benzoxazin-4-one, or a salt thereof.

7. 3-((3S,4S)-4-Hydroxytetrahydro-2H-pyran-3-yl)-7-methyl-6-(4-(1-methyl-1H-pyrazol-3-yl)benzyl)-2,3-dihydro-4H-1,3-benzoxazin-4-one, or a salt thereof.

8. A pharmaceutical composition comprising the compound according to claim 1 or a salt thereof.

9. The pharmaceutical composition according to claim 8, suitable for use as a cholinergic muscarinic M1 receptor positive allosteric modulator.

10. The pharmaceutical composition according to claim 8, suitable for use in the treatment of Alzheimer’s disease,

schizophrenia, cognitive impairment associated with schizophrenia, pain, sleep disorder, Parkinson’s disease dementia, Parkinson's disease or dementia with Lewy bodies.

11. The compound according to claim 1 or a salt thereof, for use for the prophylaxis or treatment of Alzheimer’s disease, schizophrenia, cognitive impairment associated with schizophrenia, pain, sleep disorder, Parkinson’s disease dementia, Parkinson's disease or dementia with Lewy bodies.

12. Use of the compound according to claim 1 or a salt thereof for the production of an agent for the prophylaxis or treatment of Alzheimer’s disease, schizophrenia, cognitive impairment associated with schizophrenia, pain, sleep disorder, Parkinson’s disease dementia, Parkinson's disease or dementia with Lewy bodies.

13. The compound according to claim 1 or a salt thereof, for use as a medicament.

14. Use of the compound according to claim 1 or a salt thereof in the manufacture of a medicament for the prophylaxis or treatment of Alzheimer’s disease, schizophrenia, cognitive impairment associated with schizophrenia, pain, sleep disorder, Parkinson’s disease dementia, Parkinson's disease or dementia with Lewy bodies.