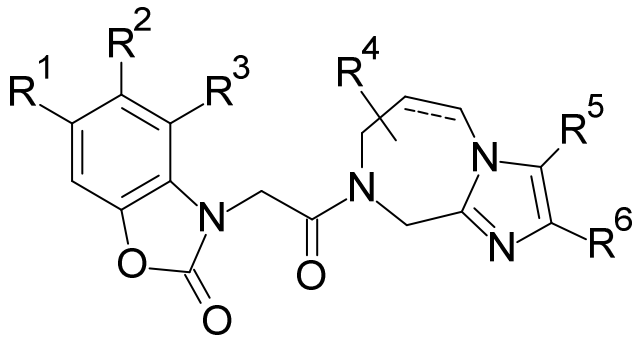
Claims

[Claim 1] A compound of the formula (I) or a salt thereof:

[Chem. 1]



(I)

in the formula,

R^1, R^2, and R^3 are the same as or different from each other, and are H, halogen, lower alkyl, or halo-lower alkyl;

R^4 is H, halogen, lower alkyl, or halo-lower alkyl;

R^5 is H;

R^6 is phenyl which may be substituted with R^{A1}'s which are the same as or different from each other, and

R^{A1} is a group selected from the group consisting of -OH, -O-lower alkyl, -CN, halogen, lower alkyl, halo-lower alkyl, lower alkylene-O-lower alkyl, -C(=O)-lower alkyl, and -C(=O)-lower alkylene-CN; or

R^5 and R^6 may form a benzene ring which may be substituted with R^{B1}'s which are the same as or different from each other, together with carbon atoms to which they are bonded

R^{B1} is a group selected from the group consisting of -OH, -O-lower alkyl, -CN, halogen, lower alkyl, halo-lower alkyl, lower alkylene-O-lower alkyl, -C(=O)-lower alkyl, and -C(=O)-lower alkylene-CN ; and

---- is a single bond or a double bond.

[Claim 2] The compound or a salt thereof according to claim 1, wherein R^5 is H, and R^6 is phenyl which may be substituted with R^{A1}'s which are the same as or different from each other, and

R^{A1} is a group selected from the group consisting of -OH, -O-lower alkyl, -CN, halogen, lower alkyl, halo-lower alkyl, lower alkylene-O-lower alkyl, -C(=O)-lower alkyl, and -C(=O)-lower alkylene-CN.

[Claim 3] The compound or a salt thereof according to claim 2, wherein ---- is a single bond.

[Claim 4] The compound or a salt thereof according to claim 3, wherein R^4 is H.

[Claim 5] The compound or a salt thereof according to claim 4, wherein R^1 is H, R^2 is H or halogen, and R^3 is halogen.

[Claim 6] The compound or a salt thereof according to claim 5, wherein R^6 is phenyl which may be substituted with one to four R^{A2}'s which are the same as or different from each other, and

R^{A2} is a group selected from the group consisting of halogen, lower alkyl, and halo-lower alkyl.

[Claim 7] The compound or a salt thereof according to claim 6, wherein R^6 is phenyl which may be substituted with one R^{A2}, and

R^{A2} is a group selected from the group consisting of halogen, lower alkyl, and halo-lower alkyl.

[Claim 8] The compound or a salt thereof according to claim 7, wherein R^2 is H.

[Claim 9] The compound or a salt thereof according to claim 8, wherein R^6 is phenyl which may be substituted with one R^{A2} at a para-position from its bond.

[Claim 10] The compound or a salt thereof according to claim 1, wherein the compound is selected from the group consisting of:

4-fluoro-3-(2-oxo-2-{2-[4-(trifluoromethyl)phenyl]-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl}ethyl)-1,3-benzoxazol-2(3H)-one,

4-fluoro-3-{2-[2-(2-fluorophenyl)-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl]-2-oxoethyl}-1,3-benzoxazol-2(3H)-one,

3-[2-(4,5-dihydro-1H-[1,4]diazepino[1,2-a]benzimidazol-2(3H)-yl)-2-oxoethyl]-4,5-difluoro-1,3-benzoxazol-2(3H)-one,

4-fluoro-3-[2-(8-fluoro-4,5-dihydro-1H-[1,4]diazepino[1,2-a]benzimidazol-2(3H)-yl)-2-oxoethyl]-1,3-benzoxazol-2(3H)-one,

4,5-difluoro-3-[2-oxo-2-(2-phenyl-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl)ethyl]-1,3-benzoxazol-2(3H)-one,

4-fluoro-3-{2-[2-(3-fluorophenyl)-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl]-2-oxoethyl}-1,3-benzoxazol-2(3H)-one, and

3-{2-[2-(4-chlorophenyl)-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl]-2-oxoethyl}-4-fluoro-1,3-benzoxazol-2(3H)-one.

[Claim 11]

The compound or a salt thereof according to claim 10, wherein the compound is selected from the group consisting of:

4-fluoro-3-(2-oxo-2-{2-[4-(trifluoromethyl)phenyl]-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl}ethyl)-1,3-benzoxazol-2(3H)-one,

4-fluoro-3-{2-[2-(2-fluorophenyl)-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl]-2-oxoethyl}-1,3-benzoxazol-2(3H)-one,

4,5-difluoro-3-[2-oxo-2-(2-phenyl-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl)ethyl]-1,3-benzoxazol-2(3H)-one,

4-fluoro-3-{2-[2-(3-fluorophenyl)-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl]-2-oxoethyl}-1,3-benzoxazol-2(3H)-one, and

3-{2-[2-(4-chlorophenyl)-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl]-2-oxoethyl}-4-fluoro-1,3-benzoxazol-2(3H)-one.

[Claim 12] The compound or a salt thereof according to claim 10, wherein the compound is 4-fluoro-3-(2-oxo-2-{2-[4-(trifluoromethyl)phenyl]-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl}ethyl)-1,3-benzoxazol-2(3H)-one.

[Claim 13] The compound or a salt thereof according to claim 10, wherein the compound is 3-{2-[2-(4-chlorophenyl)-6,7-dihydro-5H-imidazo[1,2-a][1,4]diazepin-8(9H)-yl]-2-oxoethyl}-4-fluoro-1,3-benzoxazol-2(3H)-one.

[Claim 14] A pharmaceutical composition comprising the compound or a salt thereof according to claim 1 and a pharmaceutically acceptable excipient.

[Claim 15] The pharmaceutical composition according to claim 14, which is a dopamine D1 receptor positive allosteric modulator.

[Claim 16] The pharmaceutical composition according to claim 14, for use in the prevention and/or treatment of cognitive impairment, schizophrenia negative symptom, cognitive impairment associated with schizophrenia (CIAS), Parkinson's disease,

Alzheimer's disease, Huntington's disease, depression, attention deficit hyperactivity disorder (ADHD), or drug dependency.

[Claim 17] Use of the compound or a salt thereof according to claim 1 in the manufacture of a pharmaceutical composition for the prevention and/or treatment of cognitive impairment, schizophrenia negative symptom, cognitive impairment associated with schizophrenia (CIAS), Parkinson's disease, Alzheimer's disease, Huntington's disease, depression, attention deficit hyperactivity disorder (ADHD), or drug dependency.

[Claim 18] The compound or a salt thereof according to claim 1 for use in the prevention and/or treatment of cognitive impairment, schizophrenia negative symptom, cognitive impairment associated with schizophrenia (CIAS), Parkinson's disease, Alzheimer's disease, Huntington's disease, depression, attention deficit hyperactivity disorder (ADHD), or drug dependency.