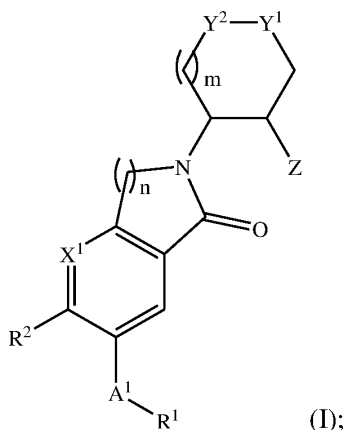


We Claim:

1. A compound of formula (I),



- 5 wherein:

R^1 is $-(C_{6-10})$ -aryl, $-(C_{5-10})$ -heteroaryl or $-(C_{3-14})$ -non-aromatic heterocyclyl; each of which is unsubstituted or substituted with one or more substituents selected from halogen, $-OH$, $-O-(C_{1-6})$ -alkyl, $-S-(C_{1-6})$ -alkyl, $-N(CH_3)_2$, $-(C_{1-6})$ -alkyl, $-(C_{3-6})$ -cycloalkyl, halo (C_{1-6}) -alkyl, $-NH_2$, $-CN$, $-CONH_2$, $-CONH-(C_{1-6})$ -alkyl and R^{1a} ;

- 10 R^{1a} is $-(C_{6-10})$ -aryl, $-(C_{5-10})$ -heteroaryl or $-(C_{3-14})$ -non-aromatic heterocyclyl; each of which is unsubstituted or substituted with one or more substituents selected from the group consisting of halogen, $-OH$, $-NH_2$, $-CN$, $-O-(C_{1-6})$ -alkyl, $-S-(C_{1-6})$ -alkyl, $-(C_{1-6})$ -alkyl and $-(C_{3-6})$ -cycloalkyl;

A^1 is CH_2 or CHF ;

- 15 R^2 is $-(C_{1-6})$ -alkyl;

X^1 is N or CR^3 ;

when X^1 is CR^3 ; then R^3 and R^2 combine together with the carbon atoms to which they are attached, form a non-aromatic 5- to 6-membered ring optionally containing one or more heteroatoms selected from nitrogen, oxygen and sulfur; wherein the said ring is

20 unsubstituted or substituted with one or more groups selected from halogen, (C_{1-6}) -alkyl and halo (C_{1-6}) -alkyl;

n is 1 or 2; m is 0 or 1;

Y^1 is CH_2 , O, NH or NCH_3 ;

Y^2 is CH_2 , O, NH or NCH_3 ; and

- 25 Z is H, OH or F;

or an isotopic form, a stereoisomer, a tautomer or a pharmaceutically acceptable salt thereof.

2. The compound as claimed in claim 1, wherein the compound is selected from the group consisting of:

- 5 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(4-pyrazol-1-ylbenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-[2-(1-methyl-1H-pyrazol-4-yl)pyridin-5-ylmethyl]-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 10 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-[4-(1-methyl-1H-pyrazol-4-yl)benzyl]-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(4-thiazol-4-ylbenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(2,3-difluorobenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 15 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(4-methoxybenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(2-methylpyridin-5-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 20 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(2-fluoropyridin-4-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(4-fluorobenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(3-fluorobenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 25 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(2-fluoropyridin-5-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(2-chloropyridin-5-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 30 6-(4-Hydroxytetrahydropyran-3-yl)-3-(4-methoxybenzyl)-2-methyl-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(4-methoxybenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;

- 6-(Tetrahydropyran-4-yl)-2-methyl-3-[2-(1-methyl-1H-pyrazol-4-yl)pyridin-5-ylmethyl]-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(Tetrahydropyran-4-yl)-2-methyl-3-[4-(2-methyl-oxazol-4-yl)-benzyl]-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 5 6-(Tetrahydropyran-4-yl)-2-methyl-3-(4-thiazol-4-ylbenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(3-chlorobenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(3,4-difluorobenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 10 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(2,3-difluorobenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(3-chlorobenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 15 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-[4-(2-methyl-oxazol-4-yl)-benzyl]-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-[4-chlorobenzyl]-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(3-methoxybenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 20 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(6-methoxypyridin-3-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(4-chlorobenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 25 6-(4-Hydroxy-tetrahydro-pyran-3-yl)-2-methyl-3-[4-methoxybenzyl]-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(2-fluoropyridin-4-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(6-fluoropyridin-3-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 30 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(2-chloropyridin-4-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;

- 6-(4-Hydroxytetrahydropyran-3-yl)-2-methyl-3-(4-pyrazol-1-yl-benzyl)-6,7-dihydro-pyrrolo[3,4-b]pyridin-5-one;
- 6-(4-Hydroxytetrahydropyran-3-yl)-2-methyl-3-[6-(1-methyl-1H-pyrazol-4-yl)-pyridin-3-ylmethyl]-6,7-dihydro-pyrrolo[3,4-b]pyridin-5-one;
- 5 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(4,4-difluoropiperidin-1-ylmethyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 1-[6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-5-oxo-6,7-dihydro-5H-pyrrolo[3,4-b]pyridin-3-ylmethyl]-4-phenyl-piperidine-4-carbonitrile;
- 1-[6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-5-oxo-6,7-dihydro-5H-pyrrolo[3,4-b]pyridin-3-ylmethyl]-4-pyridyl-piperidine-4-carbonitrile;
- 10 1-[6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-5-oxo-5,6,7,8-tetrahydro-[1,6]naphthyridin-3-ylmethyl]-4-phenyl-piperidine-4-carbonitrile;
- 6-(3-Fluoro-piperidin-4-yl)-2-methyl-3-(4-methoxybenzyl)-6,7-dihydro-pyrrolo[3,4-b]pyridin-5-one;
- 15 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(3-methoxybenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(Tetrahydro-pyran-4-yl)-2-methyl-3-(4-methoxybenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-3-(3-fluorobenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 20 6-(Tetrahydro-pyran-4-yl)-2-methyl-3-(4-thiazol-4-yl-benzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 6-(4-Hydroxy-tetrahydro-pyran-3-yl)-2-methyl-3-(4-pyrazol-1-yl-benzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
- 25 6-(Tetrahydro-pyran-4-yl)-2-methyl-3-(3-methoxybenzyl)-6,7-dihydropyrrolo[3,4-b]pyridin-5-one;
- 6-(4-Hydroxy-tetrahydro-pyran-3-yl)-2-methyl-3-(4-methoxybenzyl)-6,7-dihydro-pyrrolo[3,4-b]pyridin-5-one - Cis-isomer (Ist Eluting isomer, Peak-I);
- 6-(4-Hydroxy-tetrahydro-pyran-3-yl)-2-methyl-3-(4-methoxybenzyl)-6,7-dihydro-pyrrolo[3,4-b]pyridin-5-one - Cis,Cis-isomer (IInd Eluting isomer, Peak-II);
- 30 6-(Tetrahydro-pyran-4-yl)-2-methyl-3-(4-methoxybenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;

- 6-(Tetrahydro-pyran-4-yl)-2-methyl-3-(4-pyrazol-1-yl-benzyl)-6,7-dihydro-pyrrolo[3,4-b]pyridin-5-one;
6-(Tetrahydro-pyran-4-yl)-2-methyl-3-(4-pyrazol-1-yl-benzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
5 6-(4-Hydroxy-tetrahydro-pyran-3-yl)-2-methyl-3-(4-fluorobenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
6-(4-Hydroxy-tetrahydro-pyran-3-yl)-2-methyl-3-(3-fluorobenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one; and
6-(4-Hydroxy-tetrahydro-pyran-3-yl)-2-methyl-3-(2,3-difluorobenzyl)-7,8-dihydro-6H-[1,6]naphthyridin-5-one;
10 or a pharmaceutically acceptable salt thereof.

3. The compound as claimed in claim 1 or claim 2, wherein the pharmaceutically acceptable salt is selected from the group consisting of:
15 1-[6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-5-oxo-6,7-dihydro-5H-pyrrolo[3,4-b]pyridin-3-ylmethyl]-4-pyridyl-piperidine-4-carbonitrile L-(+)-Tartrate;
1-[6-(1S,2S-2-Hydroxycyclohexyl)-2-methyl-5-oxo-5,6,7,8-tetrahydro-[1,6]naphthyridin-3-ylmethyl]-4-phenyl-piperidine-4-carbonitrile L-(+)-Tartrate; and
20 6-(3-Fluoro-piperidin-4-yl)-2-methyl-3-(4-methoxybenzyl)-6,7-dihydro-pyrrolo[3,4-b]pyridin-5-one hydrochloride.

4. A pharmaceutical composition comprising the compound of formula (I) or a pharmaceutically acceptable salt thereof as claimed in any one of the claims 1 to 3 and pharmaceutically acceptable excipients.

- 25 5. The pharmaceutical composition as claimed in claim 4, for use in the treatment of disease or disorder mediated by muscarinic M1 receptor, wherein said disease or disorder is selected from the group consisting of cognitive disorders, Alzheimer's disease, schizophrenia, pain or sleep disorder.

- 30 6. A method of treatment of disease or disorder mediated by muscarinic M1 receptor, wherein the disease or disorder is selected from the group consisting of cognitive disorders, Alzheimer's disease, schizophrenia, pain or sleep disorder comprising administering to a

patient in need thereof, a therapeutically effective amount of the compound of formula (I) or a pharmaceutically acceptable salt thereof as claimed in any one of the claims 1 to 3.

7. The method of treating disease or disorder as claimed in claim 6, wherein the cognitive disorder is selected from the group consisting of dementia in Alzheimer's disease, dementia in Parkinson's disease, dementia in Huntington's disease, dementia associated with Down syndrome, dementia associated with Tourette's syndrome, dementia associated with post menopause, frontotemporal dementia, Lewy body dementia, Vascular dementia, dementia in HIV, dementia in Creutzfeldt-Jakob disease, substance-induced persisting dementia, dementia in Pick's disease, dementia in schizophrenia, senile dementia and dementia in general medical conditions.

8. The compound of formula (I) as claimed in any one of the claims 1 to 3, for use in the treatment of disease or disorder selected from cognitive disorders, Alzheimer's disease, schizophrenia, pain or sleep disorder.

9. Use of the compound of formula (I) as claimed in any one of the claims 1 to 3, for the manufacture of medicament for the treatment of disease or disorder selected from cognitive disorders, Alzheimer's disease, schizophrenia, pain or sleep disorder.

10. A combination comprising the compound of formula (I) as claimed in any one the claims 1 to 5, with one or more therapeutic agents selected from acetylcholinesterase inhibitors and NMDA receptor antagonist.

11. The combination as claimed in claim 10, wherein the acetylcholinesterase inhibitor is selected from the group consisting of donepezil, rivastigmine, tacrine and galantamine or a pharmaceutically acceptable salt thereof.

12. The combination as claimed in claim 10, wherein the NMDA receptor antagonist is memantine or a pharmaceutically acceptable salt thereof.

13. The combination as claimed in claim 10 to claim 12, for use in the treatment of cognitive disorders, Alzheimer's disease, schizophrenia, pain or sleep disorder in a patient.