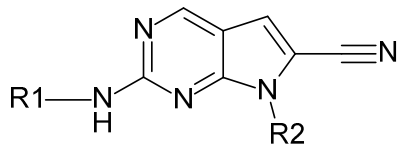
CLAIMS

What is claimed is:

1. A compound of Formula (I)



(I)

wherein:

R1 is selected from the group consisting of an aryl group, an ortho-fused bicyclic heteroaryl group and a heteroaryl group, wherein said ortho-fused bicyclic heteroaryl group is unsubstituted or substituted with one or more -(C_1-C_3)-alkyl group; and wherein said aryl and heteroaryl groups are unsubstituted or substituted with one or more substituents independently selected from the group consisting of

a) a deuterium atom,

b) a fluorine atom,

c) an alkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group, a fluorine atom, a deuterium atom, a cyano group, an alkyloxyl group, an alkylamino group, and a dialkylamino group,

d) a cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

e) a heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from an alkyl group, an alkyloxyl group, and an alkylcarbonyl group,

f) an alkyloxyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group and a fluorine atom,

g) an -O-cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

h) an -O-heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of an alkyl group, an alkyloxyl group, a hydroxy group, and an alkylcarbonyl group,

i) an -O-spirocycle group,

j) an alkylsulfonylalkyl group, and

k) an alkylsulfonyl group; and

R2 is selected from the group consisting of an alkyloxylalkyl group and a heterocycloalkyl group, wherein said heterocycloalkyl group represented by R2 is attached via a carbon atom and is unsubstituted or substituted with an alkyl group, an alkyloxyl group, or one or more fluorine;

or a pharmaceutically acceptable salt thereof.

2. The compound of claim 1, wherein

R1 is selected from the group consisting of an aryl group, an ortho-fused bicyclic heteroaryl group and a heteroaryl group, wherein said ortho-fused bicyclic heteroaryl group is unsubstituted or substituted with one or more -(C_1-C_3)-alkyl group; and wherein said aryl and heteroaryl groups are unsubstituted or substituted with one or more substituents independently selected from the group consisting of

a) a deuterium atom,

b) a fluorine atom,

c) an alkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group, a fluorine atom, a deuterium atom, a cyano group, an alkyloxyl group, an alkylamino group, and a dialkylamino group,

d) a cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom or -(C_1-C_3)-alkyl group,

e) a heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from an alkyl group, an alkyloxyl group, and an alkylcarbonyl group,

f) an alkyloxyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group and a fluorine atom,

g) an -O-cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom or -(C_1-C_3)-alkyl group,

h) an -O-heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group

consisting of an alkyl group, an alkyloxyl group, and an alkylcarbonyl group,

i) an -O-spirocycle group,

j) an alkylsulfonylalkyl group, and

k) an alkylsulfonyl group;

or a pharmaceutically acceptable salt thereof.

3. The compound of claim 1, wherein

R1 is selected from the group consisting of a phenyl group and a heteroaryl group, wherein said phenyl and heteroaryl groups are unsubstituted or substituted with one or more substituents independently selected from the group consisting of

a) a fluorine atom,

b) an alkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group, a fluorine atom, a deuterium atom, a cyano group, an alkyloxyl group, an alkylamino group, and a dialkylamino group,

c) a cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

d) a heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from an alkyl group, an alkyloxyl group, and an alkylcarbonyl group,

e) an alkyloxyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group and a fluorine atom,

f) an -O-cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

g) an -O-heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of an alkyl group, an alkyloxyl group, a hydroxy group, and an alkylcarbonyl group,

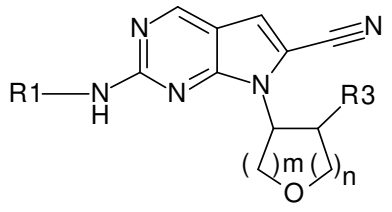
h) an -O-spirocycle group,

i) an alkylsulfonylalkyl group, and

j) an alkylsulfonyl group;

or a pharmaceutically acceptable salt thereof.

4. The compound of claim 1, having formula (Ia)



(Ia)

wherein:

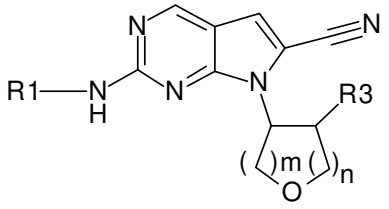
R3 is selected from the group consisting of a hydrogen atom, a -(C_1-C_3)-alkyl group and a -(C_1-C_3)-alkyloxyl group;

m represents 1, 2 or 3; and

n represents 0 or 1;

or a pharmaceutically acceptable salt thereof.

5. The compound of claim 1 having formula (Ia)



(Ia)

wherein

R1 is selected from the group consisting of a phenyl group and a heteroaryl group, wherein said phenyl and heteroaryl groups are unsubstituted or substituted with one or more substituents independently selected from the group consisting of

a) a fluorine atom,

b) an alkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group, a fluorine atom, a deuterium atom, a cyano group, an alkyloxyl group, an alkylamino group, and a dialkylamino group,

c) a cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

d) a heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from an alkyl group, an alkyloxyl group, and an alkylcarbonyl group,

e) an alkyloxyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group and a fluorine atom,

f) an -O-cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

g) an -O-heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of an alkyl group, an alkyloxyl group, a hydroxy group, and an alkylcarbonyl group,

h) an -O-spirocycle group,

i) an alkylsulfonylalkyl group, and

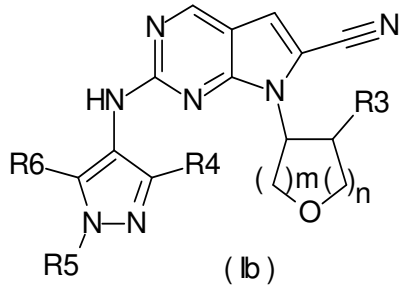
j) an alkylsulfonyl group;

m represents 1 or 2; and

n represents 0 or 1;

or a pharmaceutically acceptable salt thereof.

6. The compound of any one of claims 1 to 5, having formula (Ib)



(Ib)

wherein:

R3 is selected from the group consisting of a hydrogen atom, a -(C_1-C_3)-alkyl group and a -(C_1-C_3)-alkyloxyl group;

R4 is selected from the group consisting of

a) an alkyloxyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group and a fluorine atom,

b) an -O-cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

c) an -O-heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of an alkyl group, an alkyloxyl group, a hydroxy group, and an alkylcarbonyl group, and

d) an -O-spirocycle group;

R5 is selected from the group consisting of

a) a hydrogen atom,

b) an alkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group, a fluorine atom, a deuterium atom, a cyano group, an alkyloxyl group, an alkylamino group, and a dialkylamino group,

c) a cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

d) a heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from an alkyl group, an alkyloxyl group, and an alkylcarbonyl group,

e) an alkylsulfonylalkyl group, and

f) an alkylsulfonyl group;

R6 is selected from the group consisting of a hydrogen atom and a deuterium atom;

m represents 1, 2 or 3; and

n represents 0 or 1;

or a pharmaceutically acceptable salt thereof.

7. The compound of claim 6, wherein

R3 is selected from the group consisting of a -(C_1-C_3)-alkyl group and a -(C_1-C_3)-alkyloxyl group;

R6 is a hydrogen atom;

m represents 1 or 2; and

n represents 0 or 1;

or a pharmaceutically acceptable salt thereof.

8. The compound of claim 6, wherein

R3 is selected from the group consisting of a -(C_1-C_3)-alkyl group and a -(C_1-C_3)-alkyloxyl group;

R4 is selected from the group consisting of

a) an alkyloxyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group and a fluorine atom,

b) an -O-cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group, and

c) an -O-heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of an alkyl group, an alkyloxyl group, a hydroxy group, and an alkylcarbonyl group;

R5 is selected from the group consisting of

a) an alkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group, a fluorine atom, a deuterium atom, a cyano group, an alkyloxyl group, an alkylamino group, and a dialkylamino group,

b) a cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group, and

c) a heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from an alkyl group, an alkyloxyl group, and an alkylcarbonyl group ;

R6 is a hydrogen atom;

m represents 1; and

n represents 1;

or a pharmaceutically acceptable salt thereof.

9. The compound of claim 6, wherein

R3 is a -(C_1-C_3)-alkyl group;

R4 is selected from the group consisting of

a) an -O-cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group, and

b) an -O-heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group

consisting of an alkyl group, an alkyloxyl group, a hydroxy group, and an alkylcarbonyl group,

R5 is an alkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group, a fluorine atom, a deuterium atom, a cyano group, an alkyloxyl group, an alkylamino group, and a dialkylamino group;

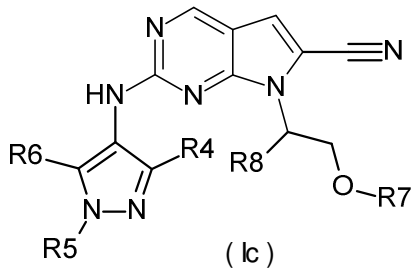
R6 is a hydrogen atom;

m represents 1; and

n represents 1;

or a pharmaceutically acceptable salt thereof.

10. The compound of claim 1, having formula (Ic)



(Ic)

wherein:

R4 is selected from the group consisting of

a) an alkyloxyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group and a fluorine atom,

b) an -O-cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

c) an -O-heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of an alkyl group, an alkyloxyl group, a hydroxy group, and an alkylcarbonyl group, and

d) an -O-spirocycle group;

R5 is selected from the group consisting of

a) a hydrogen atom,

b) an alkyl group which is unsubstituted or substituted with one or more substituents independently selected from the group consisting of a hydroxy group, a fluorine atom, a deuterium atom, a cyano group, an alkyloxyl group, an alkylamino group, and a dialkylamino group,

c) a cycloalkyl group which is unsubstituted or substituted with one or more fluorine atom, a hydroxy group or -(C_1-C_3)-alkyl group,

d) a heterocycloalkyl group which is unsubstituted or substituted with one or more substituents independently selected from an alkyl group, an alkyloxyl group, and an alkylcarbonyl group,

e) an alkylsulfonylalkyl group, and

f) an alkylsulfonyl group;

R6 is selected from the group consisting of a hydrogen atom and a deuterium atom;

R7 is a -(C_1-C_3)-alkyl group; and

R8 is a -(C_1-C_3)-alkyl group;

or a pharmaceutically acceptable salt thereof.

11. A compound selected from the group consisting of:

2-((1-methyl-3-(((2R,3S)-2-methyloxetan-3-yl)oxy)-1H-pyrazol-4-yl)amino)-7-((3R,4R)-4-methyltetrahydrofuran-3-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;

2-((1-methyl-3-(((2S,3R)-2-methyloxetan-3-yl)oxy)-1H-pyrazol-4-yl)amino)-7-((3R,4R)-4-methyltetrahydrofuran-3-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;

2-[[1-methyl-3-(oxetan-3-yloxy)pyrazol-4-yl]amino]-7-[(3R,4R)-4-methyltetrahydrofuran-3-yl]pyrrolo[2,3-d]pyrimidine-6-carbonitrile;

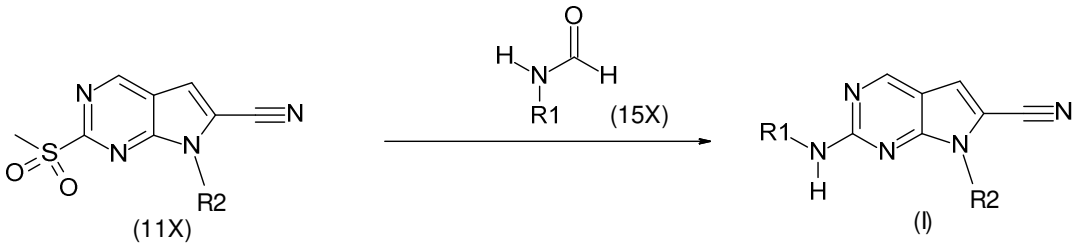
2-((1-(methyl-d3)-3-(((2R,3S)-2-methyloxetan-3-yl)oxy)-1H-pyrazol-4-yl)amino)-7-((3R,4R)-4-methyltetrahydrofuran-3-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;

2-((1-(methyl-d3)-3-(((2S,3R)-2-methyloxetan-3-yl)oxy)-1H-pyrazol-4-yl)amino)-7-((3R,4R)-4-methyltetrahydrofuran-3-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;

2-((1-(methyl-d3)-3-(oxetan-3-yloxy)-1H-pyrazol-4-yl)amino)-7-((3R,4R)-4-methyltetrahydrofuran-3-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;

2-((3-isopropoxy-1-methyl-1H-pyrazol-4-yl)amino)-7-((3R,4R)-4-methyltetrahydrofuran-3-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;
2-((1-methyl-3-(oxetan-3-yloxy)-1H-pyrazol-4-yl)amino)-7-(tetrahydro-2H-pyran-4-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;
2-((1-methyl-3-(oxetan-3-yloxy)-1H-pyrazol-4-yl)amino)-7-((3R,4S)-3-methyltetrahydro-2H-pyran-4-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;
2-((1-methyl-3-(oxetan-3-yloxy)-1H-pyrazol-4-yl)amino)-7-((3S,4R)-3-methyltetrahydro-2H-pyran-4-yl)-7H-pyrrolo[2,3-d]pyrimidine-6-carbonitrile;
7-[(1S)-2-methoxy-1-methyl-ethyl]-2-[[1-methyl-3-[(2S,3R)-2-methyloxetan-3-yl]oxy-pyrazol-4-yl]amino]pyrrolo[2,3-d]pyrimidine-6-carbonitrile;
7-[(1S)-2-methoxy-1-methyl-ethyl]-2-[[1-methyl-3-[(2R,3S)-2-methyloxetan-3-yl]oxy-pyrazol-4-yl]amino]pyrrolo[2,3-d]pyrimidine-6-carbonitrile;
7-[(1S)-2-methoxy-1-methyl-ethyl]-2-[[3-[(2S,3R)-2-methyloxetan-3-yl]oxy-1-(methyl-d3)pyrazol-4-yl]amino]pyrrolo[2,3-d]pyrimidine-6-carbonitrile;
7-[(1S)-2-methoxy-1-methyl-ethyl]-2-[[3-[(2R,3S)-2-methyloxetan-3-yl]oxy-1-(methyl-d3)pyrazol-4-yl]amino]pyrrolo[2,3-d]pyrimidine-6-carbonitrile; and
2-[[3-(cyclopropoxy)-1-(methoxymethyl)pyrazol-4-yl]amino]-7-[(1S)-2-methoxy-1-methyl-ethyl]pyrrolo[2,3-d]pyrimidine-6-carbonitrile;
or a pharmaceutically acceptable salt thereof.

12. A process for preparing a compound according to claim 1, comprising reacting a compound of formula (11X) with a compound of formula (15X):



wherein R1 and R2 are as defined for a compound of formula (I) in claim 1.

13. A pharmaceutical composition comprising a compound of any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable excipient.

14. Use of a therapeutically effective amount of the compound of any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, in the manufacture of a medicament for treating a neurodegenerative disease.

15. The use of claim 14, wherein the neurodegenerative disease is selected from the group consisting of Parkinson's disease, multiple sclerosis, HIV-induced dementia, amyotrophic lateral sclerosis, Lewy body dementia, Pick disease, progressive supranuclear palsy, and frontotemporal dementia.

16. The use of claim 14, wherein the neurodegenerative disease is Parkinson's disease.

17. A medicament, characterized in that it comprises a compound of formula (I) according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof.

18. A compound of formula (I) according to any one of claims 1 to 11, or a pharmaceutically acceptable salt thereof, for use in the treatment of a neurodegenerative disease.

19. A compound of formula (I) according to claim 18, or a pharmaceutically acceptable salt thereof, wherein the neurodegenerative disease is selected from the group consisting of Parkinson's disease, multiple sclerosis, HIV-induced dementia, amyotrophic lateral sclerosis, Lewy body dementia, Pick disease, progressive supranuclear palsy, and frontotemporal dementia.

20. A compound of formula (I) according to claim 18, or a pharmaceutically acceptable salt thereof, wherein the neurodegenerative disease is Parkinson' s disease.