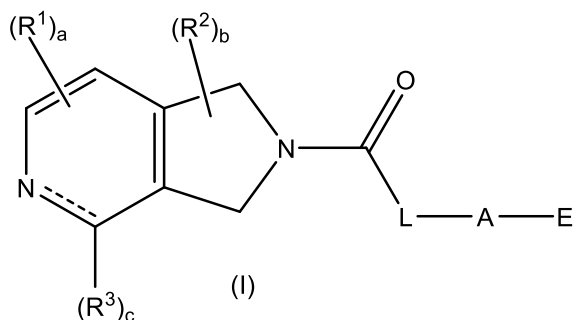


Claims

What is claimed is:

1. A compound of Formula (I):



or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein:

each R^1 , when present, is independently selected from the group consisting of halogen, cyano, hydroxy, $-SF_5$, nitro, optionally substituted (C_1-C_6) alkyl, optionally substituted (C_2-C_6) alkenyl, optionally substituted (C_2-C_6) alkynyl, optionally substituted (C_1-C_6) alkylthio, optionally substituted (C_1-C_6) alkoxy, optionally substituted (C_3-C_6) cycloalkyl, optionally substituted $-O-(C_3-C_6)$ cycloalkyl, $-N(R^4)(R^5)$, $-N(R^4)(C(=O)(R^5))$, $-C(=O)N(R^4)(R^5)$, $-O-C(=O)-N(R^4)(R^5)$, $-C(=O)-R^4$, and $-C(=O)-OR^4$;

a is an integer selected from 0, 1, 2, and 3;

each R^2 , when present, is independently selected from the group consisting of hydroxy, $-SF_5$, nitro, optionally substituted (C_1-C_6) alkyl, optionally substituted (C_2-C_6) alkenyl, optionally substituted (C_2-C_6) alkynyl, optionally substituted (C_1-C_6) alkylthio, optionally substituted (C_1-C_6) alkoxy, $-N(R^4)(R^5)$, $-N(R^4)(C(=O)(R^5))$, $-C(=O)N(R^4)(R^5)$, $-O-C(=O)-N(R^4)(R^5)$, $-C(=O)-R^4$, and $-C(=O)-OR^4$;

b is an integer selected from 0, 1, 2, 3, and 4;

R^3 , when present, is independently selected from the group consisting of halogen, cyano, hydroxy, oxo, $-SF_5$, nitro, optionally substituted (C_1-C_6) alkyl, optionally substituted (C_2-C_6) alkenyl, optionally substituted (C_2-C_6) alkynyl, optionally substituted (C_1-C_6) alkylthio, optionally substituted (C_1-C_6) alkoxy, optionally substituted (C_3-C_6) cycloalkyl, optionally substituted $-O-(C_3-C_6)$ cycloalkyl, optionally substituted (5- to 6-

membered)heteroaryl, $-N(R^4)(R^5)$, $-N(R^4)(C(=O)(R^5))$, $-C(=O)N(R^4)(R^5)$, $-O-C(=O)-N(R^4)(R^5)$, $-C(=O)-R^4$, and $-C(=O)-OR^4$, provided that when R^3 is oxo, then ----- is a single bond, or when c is 0 then R^3 is absent and ----- is a double bond;

c is an integer selected from 0 and 1;

L is $-(CH_2)_m-$, wherein m is an integer selected from 0, 1 and 2;

A is (C_3-C_6) cycloalkyl, wherein said cycloalkyl is optionally substituted with one to five substituents independently selected from the group consisting of halogen, cyano, hydroxy, $-SF_5$, nitro, optionally substituted (C_1-C_6) alkyl, optionally substituted (C_2-C_6) alkenyl, optionally substituted (C_2-C_6) alkynyl, optionally substituted (C_1-C_6) alkylthio, optionally substituted (C_1-C_6) alkoxy, $-N(R^4)(R^5)$, $-N(R^4)(C(=O)(R^5))$, $-C(=O)N(R^4)(R^5)$, $-O-C(=O)-N(R^4)(R^5)$, $-C(=O)-R^4$, and $-C(=O)-OR^4$;

E is selected from (C_3-C_{12}) cycloalkyl, (C_6-C_{10}) aryl, (5- to 6-membered)heterocycloalkyl, and (5- to 10-membered)heteroaryl, wherein said cycloalkyl, aryl, and heteroaryl are optionally substituted with one to five substituents independently selected from the group consisting of halogen, cyano, hydroxy, $-SF_5$, nitro, optionally substituted (C_1-C_6) alkyl, optionally substituted (C_2-C_6) alkenyl, optionally substituted (C_2-C_6) alkynyl, optionally substituted (C_1-C_6) alkylthio, optionally substituted (C_1-C_6) alkoxy, optionally substituted (C_3-C_6) cycloalkyl, methyloxetanyl, $-N(R^4)(R^5)$, $-N(R^4)(C(=O)R^5)$, $-C(=O)N(R^4)(R^5)$, $-O-C(=O)-N(R^4)(R^5)$, $-C(=O)-R^4$, and $-C(=O)-OR^4$; and

R^4 and R^5 at each occurrence are each independently selected from hydrogen and optionally substituted (C_1-C_6) alkyl; or R^4 and R^5 taken together with the nitrogen to which they are attached form an optionally substituted (4- to 6-membered)heterocycloalkyl.

2. The compound according to claim 1, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein R^1 is an optionally substituted (C_1-C_6) alkyl; a is an integer selected from 1, 2, and 3; each R^2 , when present, is an optionally substituted (C_1-C_6) alkyl; b is an integer selected from 0 or 1; R^3 , when present, is independently selected from the group consisting of oxo, optionally substituted (C_1-C_6) alkyl, optionally substituted (C_1-C_6) alkoxy, and $-N(R^4)(R^5)$,

provided that when R^3 is oxo, then ----- is a single bond, or when c is 0 then R^3 is absent and ----- is a double bond; and c is an integer selected from 0 and 1.

3. The compound according to claim 1, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein L is $-(CH_2)_m-$ and m is an integer selected from 1 and 2.

4. The compound according to claim 1, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein L is $-(CH_2)_m-$ and m is 1.

5. The compound according to claim 1, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein A is a (C_3-C_6) cycloalkyl selected from the group consisting of cyclopropyl, cyclobutyl, cyclopentyl, and cyclohexyl, wherein said cycloalkyl is optionally substituted with one to three substituents independently selected from the group consisting of halogen, cyano, $-N(R^3)(R^4)$, optionally substituted (C_1-C_6) alkyl, and optionally substituted (C_1-C_6) alkoxy.

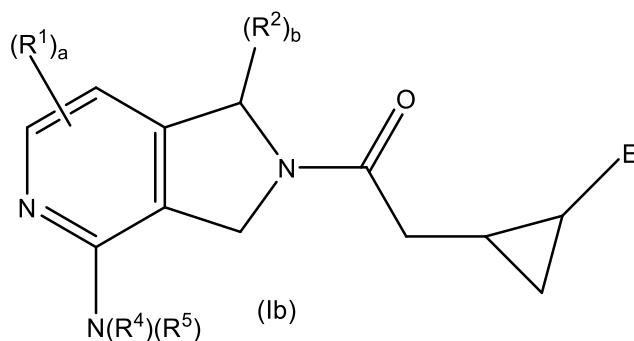
6. The compound according to claim 5, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein A is cyclopropyl.

7. The compound according to any one of claims 1-6, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein E is a (5- to 10-membered)heteroaryl selected from the group consisting of triazolyl, imidazolyl, furanyl, isoxazolyl, isothiazolyl, 1,2,3-, 1,2,4, 1,2,5-, or 1,3,4-oxadiazolyl, oxazolyl, thiophenyl, thiazolyl, thiadiazolyl, isothiazolyl, pyrazolyl, pyridinyl, pyrazinyl, pyrimidinyl, pyridazinyl, indolyl, indazolyl, benzofuranyl, benzimidazolyl, benzothienyl, benzoxadiazolyl, benzothiazolyl, isobenzothiofuranyl, benzothiofuranyl, benzisoxazolyl, benzoxazolyl, benzodioxolyl, furanopyridinyl, purinyl, imidazopyridinyl, imidazopyrimidinyl, pyrrolopyridinyl, pyrazolopyridinyl, pyrazolopyrimidinyl,

thienopyridinyl, triazolopyrimidinyl, triazolopyridinyl, anthranilyl, quinolinyl, isoquinolinyl, cinnolinyl, quinazoliny, oxochromanyl, and 1,4-benzoxazinyl, wherein said heteroaryl is optionally substituted with one to three substituents independently selected from the group consisting of halogen, cyano, $-N(R^3)(R^4)$, optionally substituted (C_1-C_6) alkyl, and optionally substituted (C_1-C_6) alkoxy.

8. The compound according to claim 7, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein the heteroaryl is a (5- to 6-membered)nitrogen-containing heteroaryl selected from the group consisting of thiadiazolyl, pyrazolyl, pyridinyl, pyrazinyl, and pyrimidinyl, wherein said nitrogen-containing heteroaryl is optionally substituted with one to three substituents independently selected from the group consisting of halogen, cyano, $-N(R^3)(R^4)$, optionally substituted (C_1-C_6) alkyl, and optionally substituted (C_1-C_6) alkoxy.

9. A compound of Formula Ib:



or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein:

each R^1 , when present, is independently selected from the group consisting of halogen, optionally substituted (C_1-C_6) alkyl, and optionally substituted (C_1-C_6) alkoxy;

a is an integer selected from 1, 2 and 3;

R^2 , when present, is an optionally substituted (C_1-C_6) alkyl;

b is an integer selected from 0 and 1;

R^4 and R^5 at each occurrence are each independently selected from hydrogen and optionally substituted (C_1-C_6) alkyl; and

E is a (5- to 6-membered)heteroaryl, wherein said heteroaryl is optionally substituted with one to three substituents independently selected from the group consisting of halogen, cyano, hydroxy, optionally substituted (C₁-C₆)alkyl, optionally substituted (C₁-C₆)alkoxy, and -N(R⁴)(R⁵), wherein R⁴ and R⁵ at each occurrence are each independently selected from hydrogen and optionally substituted (C₁-C₆)alkyl.

10. The compound according to claim 9, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein E is a (5- to 6-membered)nitrogen-containing heteroaryl selected from the group consisting of pyrazolyl, thiadiazolyl, pyridinyl, and pyrimidinyl.

11. The compound according to claim 10, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein the (5- to 6-membered)nitrogen-containing heteroaryl is pyrimidinyl.

12. The compound according to claim 10, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide, wherein, the (5- to 6-membered)nitrogen-containing heteroaryl is pyridinyl.

13. The compound according to claim 1, wherein the compound is selected from the group consisting of:

1-(4-amino-6,7-dimethyl-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl)-2-[*trans*-2-(6-fluoropyridin-3-yl)cyclopropyl]ethanone;

1-(4-amino-6,7-dimethyl-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl)-2-[*trans*-2-(6-fluoropyridin-3-yl)cyclopropyl]ethanone, ENT-1;

1-(4-amino-6,7-dimethyl-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl)-2-[*trans*-2-(6-fluoropyridin-3-yl)cyclopropyl]ethanone, ENT-2;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(pyridin-3-yl)cyclopropyl]ethanone, ENT-1;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(pyridin-3-yl)cyclopropyl]ethanone, ENT-2;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(6-fluoropyridin-3-yl)cyclopropyl]ethanone, ENT-1;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(6-fluoropyridin-3-yl)cyclopropyl]ethanone, ENT-2;

5,6,7-trimethyl-2-[[*trans*-2-(pyridin-3-yl)cyclopropyl]acetyl]-1,2,3,5-tetrahydro-4*H*-pyrrolo[3,4-*c*]pyridin-4-one, ENT-1;

5,6,7-trimethyl-2-[[*trans*-2-(pyridin-3-yl)cyclopropyl]acetyl]-1,2,3,5-tetrahydro-4*H*-pyrrolo[3,4-*c*]pyridin-4-one, ENT-2;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(pyrimidin-5-yl)cyclopropyl]ethanone;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(pyrimidin-5-yl)cyclopropyl]ethanone, ENT-1;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(pyrimidin-5-yl)cyclopropyl]ethanone, ENT-2;

2-[*trans*-2-(6-chloropyridin-3-yl)cyclopropyl]-1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]ethanone;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(4-fluorophenyl)cyclopropyl]ethanone, ENT-1;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(4-fluorophenyl)cyclopropyl]ethanone, ENT-2;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(6-methylpyridin-3-yl)cyclopropyl]ethanone;

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(6-methylpyridin-3-yl)cyclopropyl]ethanone, ENT-1; and

1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(6-methylpyridin-3-yl)cyclopropyl]ethanone, ENT-2; or

an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide.

14. The compound according to claim 1, wherein the compound is 1-[6,7-dimethyl-4-(methylamino)-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl]-2-[*trans*-2-(6-fluoropyridin-3-yl)cyclopropyl]ethanone, or an *N*-oxide thereof, or a pharmaceutically acceptable salt of the compound or the *N*-oxide.

15. The compound according to claim 1, wherein the compound is 1-(4-amino-6,7-dimethyl-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl)-2-[*trans*-2-(6-fluoropyridin-3-

yl)cyclopropyl]ethanone, or a stereoisomer thereof, or an N-oxide thereof, or a pharmaceutically acceptable salt of the compound, the stereoisomer or the N-oxide.

16. The compound according to claim 1, wherein the compound is 1-(4-amino-6,7-dimethyl-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl)-2-[*trans*-2-(6-fluoropyridin-3-yl)cyclopropyl]ethanone, ENT-1, or an N-oxide thereof, or a pharmaceutically acceptable salt of the compound or the N-oxide.

17. The compound according to claim 1, wherein the compound is 1-(4-amino-6,7-dimethyl-1,3-dihydro-2*H*-pyrrolo[3,4-*c*]pyridin-2-yl)-2-[*trans*-2-(6-fluoropyridin-3-yl)cyclopropyl]ethanone, ENT-2, or an N-oxide thereof, or a pharmaceutically acceptable salt of the compound or the N-oxide.

18. A pharmaceutical composition comprising a therapeutically effective amount of a compound, or *N*-oxide, or pharmaceutically acceptable salt of the compound or the N-oxide according to Claim 1, and a pharmaceutically acceptable carrier.

19. Use of a compound, or *N*-oxide, or pharmaceutically acceptable salt according to Claim 1, or a pharmaceutical composition according to claim 18, in the manufacture of a medicament for the treatment of an M4-associated disease or disorder.

20. The use of claim 19, wherein the M4-associated disease or disorder is selected from the group consisting of Alzheimer's Disease, schizophrenia or psychosis, pain, addiction, a sleep disorder, a cognitive disorder (e.g. mild cognitive impairment), Parkinson's Disease, Parkinson's Disease-levodopa-induced dyskinesia, Huntington's Disease, dyskinesia, dry mouth, pulmonary hypertension, chronic obstructive pulmonary disease (COPD), asthma, urinary incontinence, glaucoma, Trisomy 21 (Down Syndrome), cerebral amyloid angiopathy, dementia, Hereditary Cerebral Hemorrhage with Amyloidosis of the Dutch-Type (HCHWA-D), Creutzfeld-Jakob disease, prion disorders, amyotrophic lateral sclerosis, progressive supranuclear palsy, head trauma, stroke, pancreatitis, inclusion body myositis, other peripheral amyloidoses, diabetes, autism, and atherosclerosis.

21. The use of claim 20, wherein the M4-associated disease or disorder is selected from the group consisting of Alzheimer's Disease, schizophrenia, pain, addiction, and a sleep disorder.