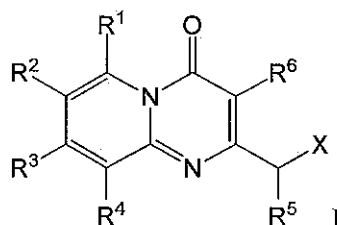


There remains a need for potent NMDA receptor modulators with desirable pharmaceutical properties.

## SUMMARY

The disclosure provides compounds of formula I



or pharmaceutically acceptable salts thereof, wherein:

X is:     -O-Ar;  
          -NR<sup>a</sup>-Ar; or  
          -Ar;

R<sup>1</sup> is:    hydrogen;  
          C<sub>1-6</sub>alkyl;  
          halo;  
          C<sub>1-6</sub>alkoxy;  
          cyano;  
          heteroaryl selected from furanyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl, pyridinyl and pyrimidinyl, each of which may be unsubstituted or substituted once or twice with R<sup>b</sup>;

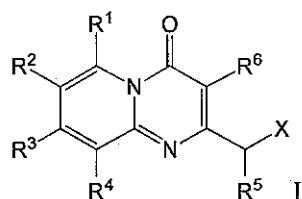
          -C(O)-NHR<sup>c</sup>;  
          -C(O)-R<sup>e</sup>; or  
          cyclopropyl which may be unsubstituted or substituted once or twice with R<sup>d</sup>;

R<sup>2</sup> is:    hydrogen;  
          C<sub>1-6</sub>alkyl;  
          C<sub>1-6</sub>alkoxy;  
          halo; or  
          halo-C<sub>1-6</sub>alkyl;

R<sup>3</sup> is:    hydrogen;  
          C<sub>1-6</sub>alkyl;  
          C<sub>1-6</sub>alkoxy;

R<sup>f</sup> is furanyl, thienyl, pyrrolyl, pyrazolyl or imidazolyl.

In one aspect, there is provided a compound of Formula I



or a pharmaceutically acceptable salt thereof, wherein:

X is:     -O-Ar;  
          -NR<sup>a</sup>-Ar; or  
          -Ar;

R<sup>1</sup> is:    hydrogen;  
          C<sub>1-6</sub>alkyl;  
          halo;  
          C<sub>1-6</sub>alkoxy;  
          cyano;  
          heteroaryl selected from furanyl, thienyl, pyrrolyl, pyrazolyl, imidazolyl, pyridinyl and pyrimidinyl, each of which may be unsubstituted or substituted once or twice with R<sup>b</sup>;

          -C(O)-NHR<sup>c</sup>;  
          -C(O)-R<sup>c</sup>; or  
          cyclopropyl which may be unsubstituted or substituted once or twice with R<sup>d</sup>;

R<sup>2</sup> is:    hydrogen;  
          C<sub>1-6</sub>alkyl;  
          C<sub>1-6</sub>alkoxy;  
          halo; or  
          halo-C<sub>1-6</sub>alkyl;

R<sup>3</sup> is:    hydrogen;  
          C<sub>1-6</sub>alkyl;  
          C<sub>1-6</sub>alkoxy;  
          halo; or  
          halo-C<sub>1-6</sub>alkyl;

R<sup>4</sup> is:    hydrogen; or  
          C<sub>1-6</sub>alkyl;

R<sup>5</sup> is:    hydrogen; or  
          C<sub>1-6</sub>alkyl; and

R<sup>6</sup> is: hydrogen;

C<sub>1-6</sub>alkyl;

Ar is: phenyl or pyrazolyl, each of which may be unsubstituted or substituted one or two times with R<sup>e</sup>;

R<sup>a</sup> is: hydrogen; or

C<sub>1-6</sub>alkyl;

each R<sup>b</sup> is independently:

C<sub>1-6</sub>alkyl;

halo;

halo-C<sub>1-6</sub>alkyl; or

cyclopropyl;

R<sup>c</sup> is: C<sub>1-6</sub>alkyl; or

halo-C<sub>1-6</sub>alkyl;

R<sup>d</sup> is: C<sub>1-6</sub>alkyl;

halo;

halo-C<sub>1-6</sub>alkyl;

hydroxy-C<sub>1-6</sub>alkyl;

C<sub>1-6</sub>alkoxy-C<sub>1-6</sub>alkyl; or

cyano;

each R<sup>e</sup> is independently:

C<sub>1-6</sub>alkyl;

halo;

halo-C<sub>1-6</sub>alkyl;

-NH-C(O)-R<sup>f</sup>;

cyano; or

cyclopropyl; and

R<sup>f</sup> is furanyl, thienyl, pyrrolyl, pyrazolyl or imidazolyl;

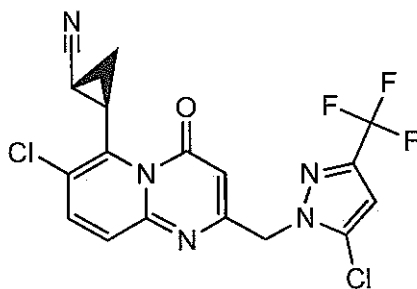
provided that

2-Benzyl-6-methyl-pyrido[1,2-a]pyrimidin-4-one; and

2-Benzyl-pyrido[1,2-a]pyrimidin-4-one;

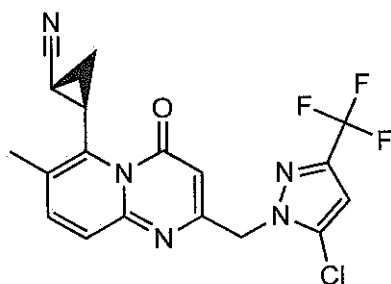
are excluded.

In another aspect, there is provided a compound having the structure



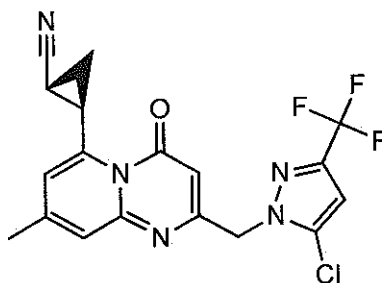
(1R,2R)-2-[7-chloro-2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

In another aspect, there is provided a compound having the structure



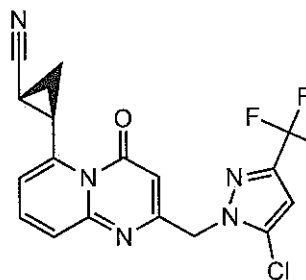
(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-methyl-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

In another aspect, there is provided a compound having the structure



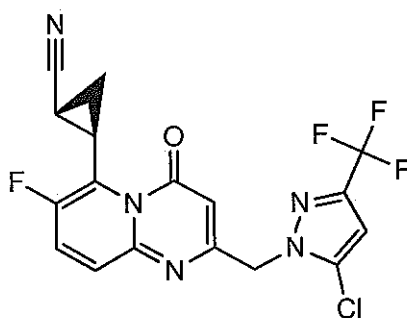
(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-8-methyl-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

In another aspect, there is provided a compound having the structure



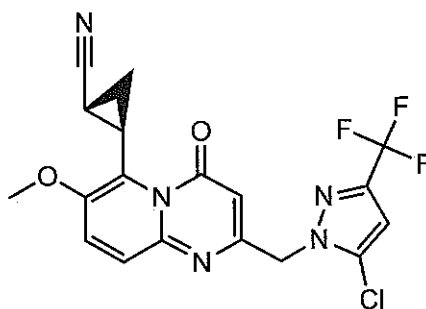
(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

In another aspect, there is provided a compound having the structure



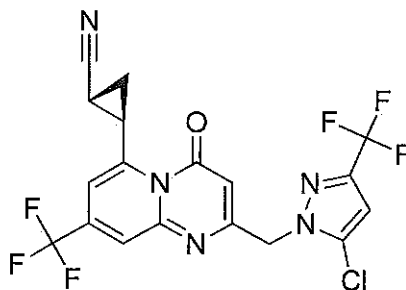
(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-fluoro-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

In another aspect, there is provided a compound having the structure



(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-methoxy-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

In another aspect, there is provided a compound having the structure



(1R,2R)-2-(2-((5-chloro-3-(trifluoromethyl)-1H-pyrazol-1-yl)methyl)-4-oxo-8-(trifluoromethyl)-4H-pyrido[1,2-a]pyrimidin-6-yl)cyclopropanecarbonitrile.

In another aspect, there is provided a pharmaceutical composition comprising: (a) an effective amount of at least one compound as defined herein, and (b) a pharmaceutically acceptable carrier.

In another aspect, there is provided a compound as defined herein for use in therapy.

In another aspect, there is provided use of at least one compound as defined herein in the manufacture of a medicament for the treatment of a disease or medical condition mediated by N2RA activity.

Also provided are methods of making the compounds and using the compounds as positive allosteric modulators of NR2A for treatment of diseases and conditions associated with the central nervous system.

#### DETAILED DESCRIPTION OF THE INVENTION

Most chemical names were generated using IUPAC nomenclature herein. Some chemical names were generated using different nomenclatures or alternative or commercial names known in the art. In the case of conflict between names and structures, the structures prevail.

##### General Definitions

As used above, and throughout this disclosure, the following terms, unless otherwise indicated, shall be understood to have the following meanings. If a definition is missing, the conventional definition as known to one skilled in the art controls. If a definition provided herein conflicts or is different from a definition provided in any cited publication, the definition provided herein controls.

As used herein, the terms “including,” “containing,” and “comprising” are used in their open, non-limiting sense.

As used herein, the singular forms “a,” “an,” and “the” include plural referents unless the context clearly dictates otherwise.

To provide a more concise description, some of the quantitative expressions given herein are not qualified with the term “about.” It is understood that, whether the term “about” is used explicitly or not, every quantity given herein is meant to refer to the actual given value, and it is also meant to refer to the

approximation to such given value that would reasonably be inferred based on the ordinary skill in the art, including equivalents and approximations due to the experimental and/or measurement conditions for such given value. Whenever a yield is given as a percentage, such yield refers to a mass of the entity for which the yield is given with respect to the maximum amount of the same entity that could be obtained under the particular stoichiometric conditions. Concentrations that are given as percentages refer to mass ratios, unless indicated differently.

Unless defined otherwise, all technical and scientific terms used herein have the same meaning as commonly understood by one of ordinary skill in the art to which this invention belongs. Although any methods and materials similar or equivalent to those described herein can also be used in the practice or testing of the present invention, the preferred methods and materials are now described. All publications mentioned herein are incorporated herein by reference to disclose and describe the methods and/or materials in connection with which the publications are cited.

(1S,2S)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-fluoro-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile;

2-[2-[[3-chloro-5-(trifluoromethyl)pyrazol-1-yl]methyl]-7-fluoro-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile;

2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]pyrido[1,2-a]pyrimidin-4-one;

6-acetyl-2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]pyrido[1,2-a]pyrimidin-4-one;

6-acetyl-2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-methyl-pyrido[1,2-a]pyrimidin-4-one;

6-acetyl-2-[[3-chloro-5-(trifluoromethyl)pyrazol-1-yl]methyl]-7-methyl-pyrido[1,2-a]pyrimidin-4-one;

(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-methoxy-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile;

(1S,2S)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-methoxy-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile;

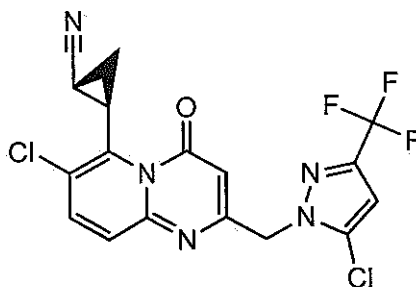
6-chloro-2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-8-(trifluoromethyl)pyrido[1,2-a]pyrimidin-4-one;

2-((3,5-dichloro-1H-pyrazol-1-yl)methyl)-7-methoxy-6-(2-methylcyclopropyl)-4H-pyrido[1,2-a]pyrimidin-4-one;

(1R,2R)-2-(2-((5-chloro-3-(trifluoromethyl)-1H-pyrazol-1-yl)methyl)-4-oxo-8-(trifluoromethyl)-4H-pyrido[1,2-a]pyrimidin-6-yl)cyclopropanecarbonitrile; and

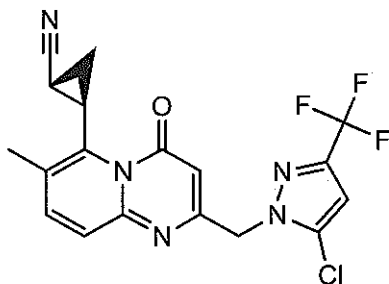
(1R,2R)-2-(2-((3,5-dichloro-1H-pyrazol-1-yl)methyl)-8-methyl-4-oxo-4H-pyrido[1,2-a]pyrimidin-6-yl)cyclopropanecarbonitrile.

21. A compound having the structure



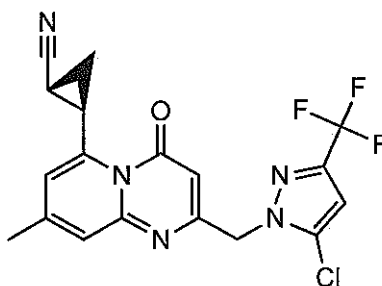
(1R,2R)-2-[7-chloro-2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

22. A compound having the structure



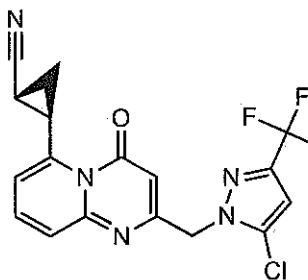
(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-methyl-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

23. A compound having the structure



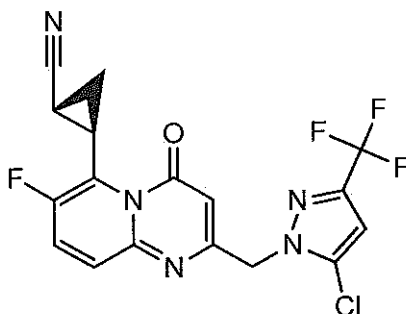
(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-8-methyl-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

24. A compound having the structure



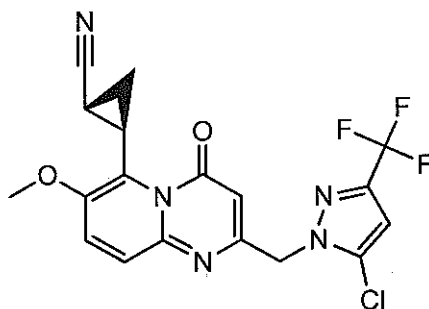
(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

25. A compound having the structure



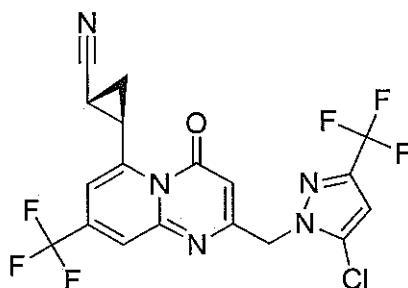
(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-fluoro-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

26. A compound having the structure



(1R,2R)-2-[2-[[5-chloro-3-(trifluoromethyl)pyrazol-1-yl]methyl]-7-methoxy-4-oxo-pyrido[1,2-a]pyrimidin-6-yl]cyclopropanecarbonitrile.

27. A compound having the structure



(1R,2R)-2-(2-((5-chloro-3-(trifluoromethyl)-1H-pyrazol-1-yl)methyl)-4-oxo-8-(trifluoromethyl)-4H-pyrido[1,2-a]pyrimidin-6-yl)cyclopropanecarbonitrile.

28. A pharmaceutical composition comprising: (a) an effective amount of at least one compound of any one of claims 1 to 27, and (b) a pharmaceutically acceptable carrier.
29. A compound according to any one of claims 1 to 27 for use in therapy.
30. Use of at least one compound of any one of claims 1 to 27 in the manufacture of a medicament for the treatment of a disease or medical condition mediated by N2RA activity.