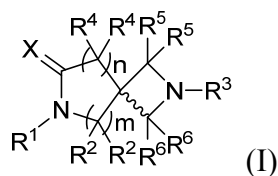


C₆alkylene-phenyl; wherein C₁-C₄alkyl, C₁-C₆alkylene, C₂-C₄alkenyl, C₁-C₄alkoxy, and phenyl are optionally substituted by one or more substituents selected from R^P; or two R⁴ moieties, when present on adjacent carbons, form a 3-membered carbocyclic ring taken together with the adjacent carbons to which they are attached, optionally substituted by one or two substituents independently selected from the group consisting of halogen, hydroxyl, -C₁-C₃alkyl, -C₁-C₃alkoxy, -C(O)NR^aR^b, and -NR^aR^b; R^a and R^b are each independently for each occurrence selected from the group consisting of hydrogen, -C₁-C₄alkyl, and -CH₂-phenyl; or R^a and R^b taken together with the nitrogen to which they are attached form a 4-6 membered heterocyclic ring; R⁵ is independently selected for each occurrence from the group consisting of hydrogen, -C₁-C₃alkyl, phenyl, and halogen; wherein phenyl is optionally substituted by one or more substituents selected from R^P; or two R⁵ moieties together with the carbon to which they are attached form a carbonyl moiety or thiocarbonyl moiety; R⁶ is independently selected for each occurrence from the group consisting of hydrogen, -C₁-C₃alkyl, phenyl and halogen; wherein phenyl is optionally substituted by one or more substituents selected from R^P; or two R⁶ moieties together with the carbon to which they are attached form a carbonyl moiety or thiocarbonyl moiety; and R^P is independently selected for each occurrence from the group consisting of carboxy, hydroxyl, halogen, -NR^aR^b, phenyl, -C₁-C₆alkoxy, and -C₁-C₆alkyl; wherein each phenyl, C₁-C₆alkoxy and C₁-C₆alkyl is optionally substituted by one or more substituents independently selected from the group consisting of halogen and hydroxyl.

In one aspect of the present disclosure, there is provided a compound represented by Formula I:



or a pharmaceutically acceptable salt, a stereoisomer, and/or an N-oxide thereof, wherein:

4a

m is 0, 1 or 2;

n is 1 or 2;

X is O or S;

R¹ is selected from the group consisting of hydrogen, -C₁-C₆alkyl, -C(O)-C₁-C₆alkyl, -C(O)-O-C₁-C₆alkyl, -C₁-C₆alkylene-C₁-C₆cycloalkyl, and phenyl;

R² is independently selected for each occurrence from the group consisting of hydrogen, cyano, -C₁-C₆alkyl, and halogen;

R³ is selected from the group consisting of hydrogen, -C₁-C₆alkyl, -C(O)-R³¹, -C(O)-O-R³², and phenyl;

R³¹ is selected from the group consisting of hydrogen, -C₁-C₆alkyl, -C₁-C₆haloalkyl, -C₃-C₆cycloalkyl, and phenyl;

R³² is selected from the group consisting of hydrogen, -C₁-C₆alkyl, -C₁-C₆haloalkyl, -C₃-C₆cycloalkyl, and phenyl;

wherein any aforementioned C₁-C₆alkyl, independently for each occurrence, is optionally substituted by one, two or three substituents each independently selected from -C(O)NR^aR^b, -NR^aR^b, hydroxyl, -SH, phenyl, -O-CH₂-phenyl, and halogen; and any aforementioned phenyl, independently for each occurrence, is optionally substituted by one, two or three substituents each independently selected from -C(O)NR^aR^b, -NR^aR^b, -C₁-C₃alkoxy, hydroxyl, and halogen;

R⁴ is independently selected for each occurrence from the group consisting of hydrogen, halogen, hydroxyl, cyano, phenyl, -C₁-C₄alkyl, -C₂₋₄alkenyl, -C₁₋₄alkoxy, -C(O)NR^aR^b, -NR^aR^b, -N(R^a)-phenyl, -N(R^a)-C₁-C₆alkylene-phenyl, -N(R^a)-C(O)-C₁-C₆alkyl, -N(R^a)-C(O)-C₁-C₆alkylene-phenyl, -N(R^a)-C(O)-O-C₁-C₆alkyl, and -N(R^a)-C(O)-O-C₁-C₆alkylene-phenyl; wherein C₁-C₄alkyl, C₁-C₆alkylene, C₂₋₄alkenyl, C₁₋₄alkoxy, and phenyl are optionally substituted by one or more substituents selected from R^P; or

4b

two R^4 moieties, when present on adjacent carbons, form a 3-membered carbocyclic ring taken together with the adjacent carbons to which they are attached, optionally substituted by one or two substituents independently selected from the group consisting of halogen, hydroxyl, $-C_1-C_3$ alkyl, $-C_1-C_3$ alkoxy, $-C(O)NR^aR^b$, and $-NR^aR^b$;

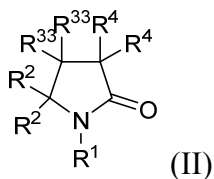
R^a and R^b are each independently for each occurrence selected from the group consisting of hydrogen, $-C_1-C_4$ alkyl, and $-\text{CH}_2$ -phenyl; or R^a and R^b taken together with the nitrogen to which they are attached form a 4-6 membered heterocyclic ring;

R^5 is independently selected for each occurrence from the group consisting of hydrogen, $-C_1-C_3$ alkyl, phenyl, and halogen; wherein phenyl is optionally substituted by one or more substituents selected from R^P ; or two R^5 moieties together with the carbon to which they are attached form a carbonyl or thiocarbonyl moiety;

R^6 is independently selected for each occurrence from the group consisting of hydrogen, $-C_1-C_3$ alkyl, phenyl and halogen; wherein phenyl is optionally substituted by one or more substituents selected from R^P ; or two R^6 moieties together with the carbon to which they are attached form a carbonyl or thiocarbonyl moiety; and

R^P is independently selected for each occurrence from the group consisting of carboxy, hydroxyl, halogen, $-NR^aR^b$, phenyl, $-C_1-C_6$ alkoxy, and $-C_1-C_6$ alkyl; wherein each phenyl, C_1-C_6 alkoxy and C_1-C_6 alkyl is optionally substituted by one or more substituents independently selected from the group consisting of halogen and hydroxyl.

In another aspect of the present disclosure, there is provided A compound represented by Formula II:



or a pharmaceutically acceptable salt, a stereoisomer, and/or an N-oxide thereof, wherein:

4c

R¹ is selected from the group consisting of hydrogen, -C₁-C₆alkyl, -C(O)-C₁-C₆alkyl, -C(O)-O-C₁-C₆alkyl, and phenyl;

R² is selected from the group consisting of hydrogen, -C₁-C₆alkyl, -C(O)-R²¹, -C(O)-O-R²², and phenyl;

R²¹ is selected from the group consisting of hydrogen, -C₁-C₆alkyl, -C₁-C₆haloalkyl, -C₃-C₆cycloalkyl, and phenyl;

R²² is selected from the group consisting of hydrogen, -C₁-C₆alkyl, -C₁-C₆haloalkyl, -C₃-C₆cycloalkyl, and phenyl;

wherein any aforementioned C₁-C₆alkyl, independently for each occurrence, is optionally substituted by one, two or three substituents each independently selected from -C(O)NR^aR^b, -NR^aR^b, hydroxyl, -SH, phenyl, -O-CH₂-phenyl, and halogen; and any aforementioned phenyl, independently for each occurrence, is optionally substituted by one, two or three substituents each independently selected from -C(O)NR^aR^b, -NR^aR^b, -C₁-C₃alkoxy, hydroxyl, and halogen;

R³³ and R⁴ are independently selected for each occurrence from the group consisting of hydrogen, halogen, hydroxyl, phenyl, -C₁-C₄alkyl, -C₂-C₄alkenyl, -C₁-C₄alkoxy, -C(O)NR^aR^b, -NR^aR^b, -N(R^a)-phenyl, -N(R^a)-C₁-C₆alkylene-phenyl, -N(R^a)-C(O)-C₁-C₆alkyl, -N(R^a)-C(O)-C₁-C₆alkylene-phenyl, -N(R^a)-C(O)-O-C₁-C₆alkyl, and -N(R^a)-C(O)-O-C₁-C₆alkylene-phenyl; wherein C₁₋₄alkyl, C₁₋₆alkylene, C₂₋₄alkenyl, C₁₋₄alkoxy, and phenyl are optionally substituted by one or more substituents selected from R^P; or

R³³ and R⁴ together form a 3-membered carbocyclic ring with the adjacent carbons to which they are attached, wherein the 3-membered carbocyclic ring is optionally substituted by one or two substituents independently selected from the group consisting of halogen, hydroxyl, -C₁-C₃alkyl, -C₁-C₃alkoxy, -C(O)NR^aR^b, and -NR^aR^b;

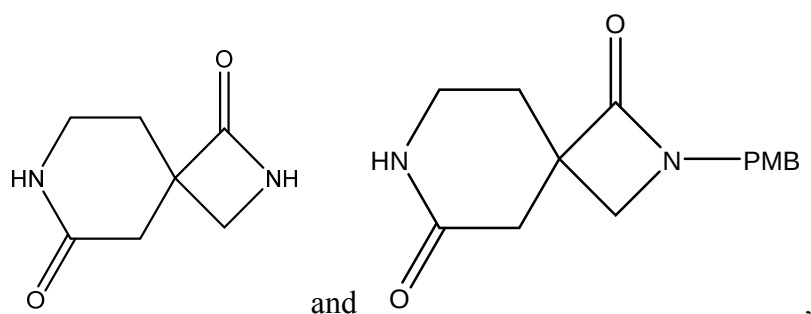
R^a and R^b are each independently for each occurrence selected from the group consisting of hydrogen and -C₁-C₃alkyl; or R^a and R^b taken together with the nitrogen to which they are attached form a 4-6 membered heterocyclic ring; and

4d

R^P is independently for each occurrence selected from the group consisting of carboxy, hydroxyl, halogen, $-NR^aR^b$, phenyl, C_{1-6} alkoxy, and C_{1-6} alkyl optionally substituted by one or more substituents independently selected from the group consisting of halogen and hydroxyl.

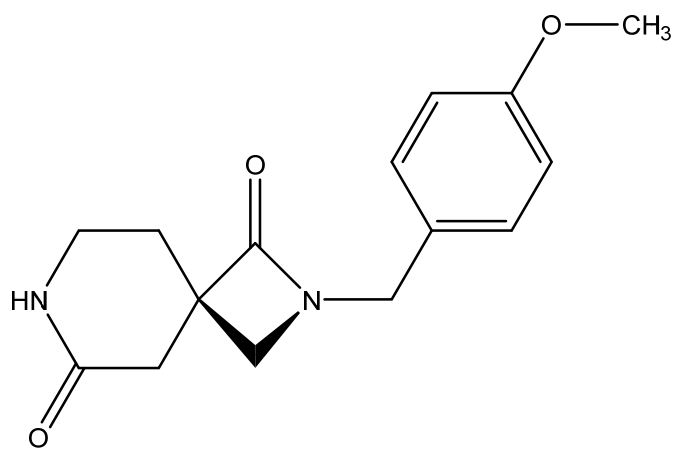
In a further aspect of the present disclosure, there is provided A compound selected from the group consisting of Compound AA-1, Compound AA-2, and Compounds AB to DN and/or compounds depicted in Table 1, or a pharmaceutically acceptable salts and/or a stereoisomer and/or an N-oxide thereof.

In another aspect of the present disclosure, there is provided A compound selected from:



or a pharmaceutically acceptable salt, a stereoisomer, and/or an N-oxide thereof.

In a further aspect of the present disclosure, there is provided a compound having the formula:



or a pharmaceutically acceptable salt thereof.

In another aspect of the present disclosure, there is provided a pharmaceutical composition comprising a compound disclosed herein; and a pharmaceutically acceptable excipient.

In a further aspect of the present disclosure, there is provided a use of a compound disclosed herein, or a pharmaceutical composition disclosed herein, in the manufacture of a medicament for treating depression, Alzheimer's disease, a migraine, neuropathic pain, attention deficit disorder, schizophrenia, or anxiety, in a patient in need thereof.

In another aspect of the present disclosure, there is provided a use of a compound disclosed herein, or a pharmaceutical composition disclosed herein, in the manufacture of a medicament for treating dementia in a patient in need thereof.

In a further aspect of the present disclosure, there is provided a use of a compound disclosed herein, or a pharmaceutical composition disclosed herein, in the manufacture of a medicament for treating a memory disorder associated with aging, schizophrenia, special learning disorders, seizures, post-stroke convulsions, brain ischemia, hypoglycemia, cardiac arrest, epilepsy, Lewy body dementia, migraine, AIDS dementia, Huntington's chorea, Parkinson's disease, early stage Alzheimer's disease, or Alzheimer's disease in a patient in need thereof.

In another aspect of the present disclosure, there is provided a use of a compound disclosed herein, or a pharmaceutical composition disclosed herein, in the manufacture of a medicament for treating traumatic brain injury in a patient in need thereof.

In a further aspect of the present disclosure, there is provided a use of a compound disclosed herein, or a pharmaceutical composition disclosed herein, in the manufacture of a medicament for treating a neurodevelopmental disorder related to synaptic dysfunction in a patient in need thereof.

In another aspect of the present disclosure, there is provided a compound disclosed herein, or a pharmaceutical composition disclosed herein, for use in treating depression, Alzheimer's disease, migraine, neuropathic pain, attention deficit disorder, schizophrenia, anxiety, dementia, memory disorder associated with aging, schizophrenia, special learning disorders, seizures, post-stroke convulsions, brain ischemia, hypoglycemia, cardiac arrest, epilepsy, Lewy body dementia, migraine, AIDS dementia, Huntington's chorea, Parkinson's disease, early stage Alzheimer's disease, Alzheimer's disease, a traumatic brain injury, or a neurodevelopmental disorder related to synaptic dysfunction.

Also provided herein are pharmaceutically acceptable compositions comprising a disclosed compound, and a pharmaceutically acceptable excipient. Such compositions can be suitable for administration to a patient orally, parenterally, topically, intravaginally, intrarectally, sublingually, ocularly, transdermally, or nasally.

In some embodiments, compounds described herein bind to NMDA receptors expressing certain NR2 subtypes. In some embodiments, the compounds described herein bind to one NR2 subtype and not another. It is appreciated that disclosed compounds may bind to another protein target and/or another NMDA receptor type.

In another embodiments, a method of treating a condition selected from the group consisting of autism, anxiety, depression, bipolar disorder, attention deficit disorder, attention deficit

41. Use of a compound of any one of claims 1-38, or a pharmaceutical composition of claim 39 or 40, in the manufacture of a medicament for treating depression, Alzheimer's disease, a migraine, neuropathic pain, attention deficit disorder, schizophrenia, or anxiety, in a patient in need thereof.

42. Use of a compound of any one of claims 1-38, or a pharmaceutical composition of claim 39 or 40, in the manufacture of a medicament for treating dementia in a patient in need thereof.

43. Use of a compound of any one of claims 1-38, or a pharmaceutical composition of claim 39 or 40, in the manufacture of a medicament for treating a memory disorder associated with aging, schizophrenia, special learning disorders, seizures, post-stroke convulsions, brain ischemia, hypoglycemia, cardiac arrest, epilepsy, Lewy body dementia, migraine, AIDS dementia, Huntington's chorea, Parkinson's disease, early stage Alzheimer's disease, or Alzheimer's disease in a patient in need thereof.

44. Use of a compound of any one of claims 1-38, or a pharmaceutical composition of claim 39 or 40, in the manufacture of a medicament for treating traumatic brain injury in a patient in need thereof.

45. Use of a compound of any one of claims 1-38, or a pharmaceutical composition of claim 39 or 40, in the manufacture of a medicament for treating a neurodevelopmental disorder related to synaptic dysfunction in a patient in need thereof.

46. A compound of any one of claims 1-38, or a pharmaceutical composition of claim 39 or 40, for use in treating depression, Alzheimer's disease, migraine, neuropathic pain, attention deficit disorder, schizophrenia, anxiety, dementia, memory disorder associated with aging, schizophrenia, special learning disorders, seizures, post-stroke convulsions, brain ischemia, hypoglycemia, cardiac arrest, epilepsy, Lewy body dementia, migraine, AIDS dementia, Huntington's chorea, Parkinson's disease, early stage Alzheimer's disease, Alzheimer's disease, a traumatic brain injury, or a neurodevelopmental disorder related to synaptic dysfunction.