

[0010] In some embodiments, the sample has a gene expression pattern as provided in Table 1 or 2 with the indication "G" and the identifying is based on increased expression of those genes.

[0011] In some embodiments, a contemplated method further comprises analyzing the candidate compound for NDMA subunit NR2B synaptic plasticity.

[0012] In another aspect, a method for identifying a compound suitable for treatment of depression is provided. The method comprises exposing a cell to a potential compound in a culture medium, or administering a potential compound to an animal; retrieving a sample from the cell and/or culture medium, or from brain or neural tissue of the animal, at one or more predetermined time points; analyzing the sample for NMDA receptor NR2B subunit plasticity, and identifying the compound as suitable for treatment of depression based on inducing the NR2B plasticity.

[0012a] In one aspect, there is provided a method for identifying a candidate compound suitable for treatment of depression, comprising: exposing a cell to a potential compound in a culture medium and -retrieving a sample from the cell and/or culture medium at one or more predetermined time points; or providing a sample that was retrieved from brain or neural tissue of an animal, at one or more predetermined time points, wherein the animal was previously administered a potential compound; and (a) analyzing the sample for increased expression levels of Wnt1, and identifying the candidate compound as suitable for treatment of depression based on the increased expression level of Wnt1, or (b) analyzing the sample for increased expression levels of at least one of the genes listed in Table 1 or 2 indicated with a G, or decreased expression levels or at least one of the genes listed in Table 1 or 2 indicated with a K, and identifying the compound as suitable for treatment of depression based on the increased expression level or decreased expression level, or (c) analyzing the sample for NMDA receptor NR2B subunit plasticity, and identifying the compound as suitable for treatment of depression based on inducing the NR2B plasticity.

[0013] In some embodiments, a candidate compound suitable for treating depression significantly induces NR2B dependent synaptic plasticity as compared to ketamine.

[0014] In some embodiments, the tissue is medial prefrontal cortex.

[0015] In some embodiments, the animal is a rodent or human, and the cell is a human or rodent cell.

[0016] In some embodiments, the compound modulates the NMDA receptor.

[0017] In some embodiments, the compound suitable for treating depression has fewer side effects as compared to ketamine.

[0018] In some embodiments, the compound does not have substantial addictive sensory motor grating and/or sedative effect.

[0019] In some embodiments, the cell is a eukaryotic cell.

[0020] In some embodiments, a contemplated method further comprises selecting the candidate compound from a library of compounds.

[0021] In yet another aspect, a method of identifying a therapeutic compound capable of treating depression in a patient is provided. The method comprises selecting a compound that significantly induces NR2B dependent synaptic plasticity.

1. A method for identifying a candidate compound suitable for treatment of depression, comprising:

exposing a cell to a potential compound in a culture medium, or administering a potential compound to an animal and ; retrieving a sample from the cell and/or culture medium at one or more predetermined time points; or

providing a sample that was retrieved or from brain or neural tissue of the an animal, at one or more predetermined time points, wherein the animal was previously administered a potential compound; and

(a) analyzing the sample for increased expression levels of Wnt1, and

identifying the candidate compound as suitable for treatment of depression based on the increased expression level of Wnt1, or

(b) analyzing the sample for increased expression levels of at least one of the genes listed in Table 1 or 2 indicated with a G, or decreased expression levels or at least one of the genes listed in Table 1 or 2 indicated with a K, and

identifying the compound as suitable for treatment of depression based on the increased expression level or decreased expression level, or

(c) analyzing the sample for NMDA receptor NR2B subunit plasticity, and

identifying the compound as suitable for treatment of depression based on inducing the NR2B plasticity.

2. ~~A method for identifying a candidate compound suitable for treatment of depression, comprising:~~

~~exposing a cell to a potential compound in a culture medium, or administering a potential compound to an animal;~~

~~retrieving a sample from the cell and/or culture medium, or from brain or neural tissue of the animal, at one or more predetermined time points;~~

~~analyzing the sample for increased expression levels of at least one of the genes listed in Table 1 or 2 indicated with a G, or decreased expression levels or at least one of the genes listed in Table 1 or 2 indicated with a K, and~~

~~identifying the compound as suitable for treatment of depression based on the increased expression level or decreased expression level.~~

32. The method of claim ~~21~~ when comprising step (b), wherein the sample has a gene expression pattern as provided in Table 1 or 2 with the indication "G" and the identifying is based on increased expression of those genes.

43. The method of ~~any one of claims 1-3~~ when comprising step (a) or step (b), further comprising analyzing the candidate compound for NDMA subunit NR2B synaptic plasticity.

~~5. A method for identifying a compound suitable for treatment of depression, comprising:~~

~~exposing a cell to a potential compound in a culture medium, or administering a potential compound to an animal;~~

~~retrieving a sample from the cell and/or culture medium, or from brain or neural tissue of the animal, at one or more predetermined time points;~~

~~analyzing the sample for NMDA receptor NR2B subunit plasticity, and~~

~~identifying the compound as suitable for treatment of depression based on inducing the NR2B plasticity.~~

64. The method of claim 51 ~~when comprising step (c)~~, wherein a candidate compound suitable for treating depression significantly induces NR2B dependent synaptic plasticity as compared to ketamine.

75. The method of any one of claims 1-64, wherein the tissue is medial prefrontal cortex.

86. The method of any one of claims 1-75, wherein the animal is a rodent or human, and the cell is a human or rodent cell.

97. The method of any one of claims 1-76, wherein the compound modulates the NMDA receptor.

108. The method of any one of claims 1-87, wherein the compound suitable for treating depression has fewer side effects as compared to ketamine.

119. The method of claim 108, wherein the compound does not have substantial addictive sensory motor grating and/or sedative effect.

1210. The method of any one of claims 1-119, wherein the cell is a eukaryotic cell.

1311. The method of any one of claims 1-1210, further comprising selecting the candidate compound from a library of compounds.

14. ~~A method of identifying a therapeutic compound capable of treating depression in a patient, comprising selecting a compound that significantly induces NR2B dependent synaptic plasticity.~~