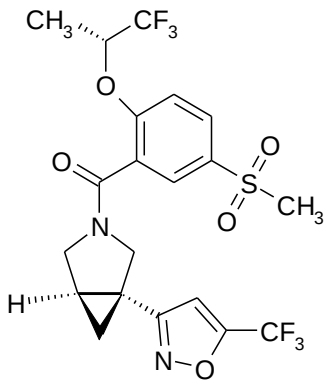

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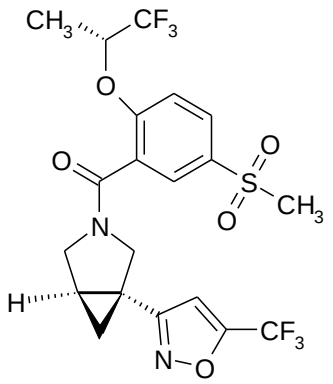
wherein the Form I of Compound **1** is characterized by:

at least three XRPD peaks at 2Θ angles selected from 4.6°, 10.0°, 16.7°, 18.0°, 19.0°, 20.0° and 22.7°; or

at least three ^{13}C solid-state nuclear magnetic resonance peaks at chemical shifts selected from 131.5 ppm, 127.2 ppm, 28.7 ppm, and 25.7 ppm; or

at least three ^{19}F solid-state nuclear magnetic resonance peaks at chemical shifts selected from −64.3, −64.8, −65.9, −66.8, −78.0, −78.5, −79.3, and −80.0 ppm.

In another aspect, the present disclosure relates to a solid Form II of Compound **1** having the structural formula:



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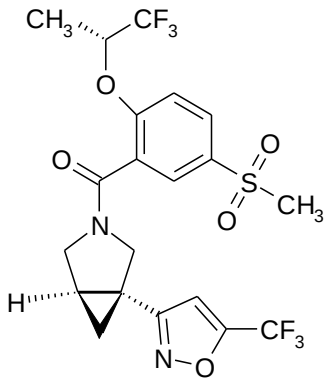
wherein the Form II is characterized by:

XRPD peaks at 2Θ angles selected from 4.1°, 4.6°, 10.0°, 16.7°, and 18.0°; or

^{13}C solid-state NMR chemical shifts selected from 130.1 ppm, 46.6 ppm, and 25.0 ppm; or

at least three ^{19}F solid-state nuclear magnetic resonance peaks at chemical shifts selected from −64.0, −65.6, −66.6, −78.2, and −79.1 ppm.

In another aspect, the present disclosure relates to a solid Form III of Compound **1** having the structural formula:



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wherein the Form III of Compound **1** is characterized by:
at least three XRPD peaks at 2Θ angles selected from 4.8°, 9.7°, 10.3°, 13.9°, and 24.6°; or at least three ^{13}C solid-state nuclear magnetic resonance peaks at chemical shifts selected from 156.6 ppm, 134.2 ppm, 46.0 ppm, 25.5 ppm, and 14.3 ppm.

The disclosure also relates to methods of making the compounds of the disclosure and their use as modulators of GlyT1.

In another aspect, the present disclosure relates to a method of making solid Form I according to Compound **1** of the disclosure, comprising:

(a) heating Compound **1** and tert-butyl methyl ether (TBME) or water to provide a slurry;
(b) cooling the slurry of step (a); and
(c) collecting the resulting solids as Form I of Compound 1.

In another aspect, the present disclosure relates to a method of making Form II of Compound **1** according to the disclosure, comprising:

(a) heating a mixture of Compound **1** and 2-propanol to 70 °C to provide a solution;
(b) filtering the solution of step (a);
(c) cooling the filtrate from step (b) to 55°C;

(d) treating the cooled solution of step (c) with water;

(e) cooling the water-treated mixture of step (d) to 20°C; and

(f) collecting the resulting solids as Form II of Compound **1**.

In another aspect, the present disclosure relates to a method of making solid Form III of Compound **1** according to the disclosure, comprising:

(a) heating a mixture of Compound **1** and methanol to 50-55°C to provide a solution;

(b) concentrating the solution of step (a) at 40-45°C;

(c) cooling the concentrated solution from step (b) to 25°C; and

(d) collecting the resulting solids as Form III of Compound **1**.

The present disclosure relates to pharmaceutical compositions, comprising a compound of the disclosure, optionally together with one or more inert carriers and/or diluents.

In another aspect, the present disclosure relates to a pharmaceutical composition comprising the solid form of Compound **1** according to the disclosure, optionally together with one or more inert carriers and/or diluents.

The present disclosure relates to compounds of the disclosure or pharmaceutical compositions comprising the compounds of the disclosure for the use in the prevention and/or treatment of neurological or psychiatric disorders.

In another aspect, the present disclosure relates to a solid form of Compound **1** according to the disclosure or a pharmaceutical composition according to the disclosure for use in the prevention and/or treatment of a neurological or psychiatric disorder.

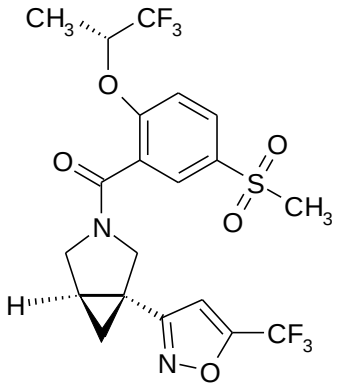
In another aspect, the present disclosure relates to use of the solid form of Compound **1** according to the disclosure or the pharmaceutical composition according to the disclosure in the manufacture of a medicament for the treatment or prevention of a neurological or psychiatric disorder.

The present disclosure relates to compounds of the disclosure or pharmaceutical compositions comprising said compounds for use in the prevention and/or treatment of diseases or conditions which can be influenced by inhibition of GlyT1, such as

Claims

What is claimed is:

1. A solid Form I of Compound **1** having the structural formula:



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wherein the Form I of Compound **1** is characterized by:
at least three XRPD peaks at 2Θ angles selected from 4.6°, 10.0°, 16.7°, 18.0°, 19.0°, 20.0° and 22.7°; or
at least three ^{13}C solid-state nuclear magnetic resonance peaks at chemical shifts selected from 131.5 ppm, 127.2 ppm, 28.7 ppm, and 25.7 ppm; or
at least three ^{19}F solid-state nuclear magnetic resonance peaks at chemical shifts selected from −64.3, −64.8, −65.9, −66.8, −78.0, −78.5, −79.3, and −80.0 ppm.

2. The solid Form I of Compound **1** according to claim 1, characterized by at least four XRPD peaks at 2Θ angles selected from 4.6°, 10.0°, 16.7°, 18.0°, 19.0°, 20.0° and 22.7°.

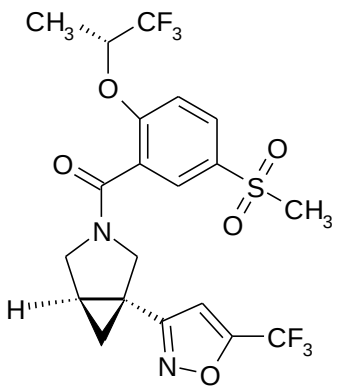
3. The solid Form I of Compound **1** according to 1 or 2, characterized by at least five XRPD peaks at 2Θ angles selected from 4.6°, 10.0°, 16.7°, 18.0°, 19.0°, 20.0° and 22.7°.

4. The solid Form I of Compound **1** according to any one of claims 1 to 3, characterized by the following XRPD peaks at 2Θ angles: 4.6°, 10.0°, 16.7°, 18.0°, 19.0°, 20.0° and 22.7°.

5. The solid Form I of Compound **1** according to any one of claims 1 to 4, characterized by the following ^{13}C solid-state nuclear magnetic resonance peaks at chemical shifts: 131.5 ppm, 127.2 ppm, 28.7 ppm, and 25.7 ppm.

6. The solid Form I of Compound **1** according to any one of claims 1 to 5, characterized by the following ^{19}F solid-state nuclear magnetic resonance peaks at chemical shifts: −64.3, −64.8, −65.9, −66.8, −78.0, −78.5, −79.3, and −80.0 ppm.

7. A solid Form II of Compound **1** having the structural formula:



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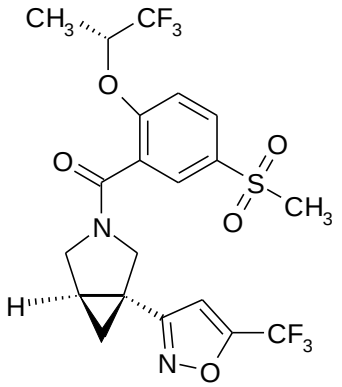
wherein the Form II is characterized by:
XRPD peaks at 2Θ angles selected from 4.1°, 4.6°, 10.0°, 16.7°, and 18.0°; or
^{13}C solid-state NMR chemical shifts selected from 130.1 ppm, 46.6 ppm, and 25.0 ppm; or
at least three ^{19}F solid-state nuclear magnetic resonance peaks at chemical shifts selected from −64.0, −65.6, −66.6, −78.2, and −79.1 ppm.

8. The solid Form II of Compound **1** according to claim 7, characterized by at least four XRPD peaks at 2Θ angles selected from 4.1°, 4.6°, 10.0°, 16.7°, and 18.0°.

9. The solid Form II of Compound **1** according to claim 7 or 8, characterized by the following XRPD peaks at 2Θ angles: 4.1°, 4.6°, 10.0°, 16.7°, and 18.0°.

10. The solid Form II of Compound **1** according to any one of claims 7 to 9, characterized by the following ^{19}F solid-state nuclear magnetic resonance peaks at chemical shifts: −64.0, −65.6, −66.6, −78.2, and −79.1 ppm.

11. A solid Form III of Compound **1** having the structural formula:



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wherein the Form III of Compound **1** is characterized by:

at least three XRPD peaks at 2Θ angles selected from 4.8°, 9.7°, 10.3°, 13.9°, and 24.6°; or

at least three ^{13}C solid-state nuclear magnetic resonance peaks at chemical shifts selected from 156.6 ppm, 134.2 ppm, 46.0 ppm, 25.5 ppm, and 14.3 ppm.

12. The solid Form III of Compound **1** of claim 11, characterized by at least four XRPD peaks at 2Θ angles selected from 4.8°, 9.7°, 10.3°, 13.9°, and 24.6°.

13. The solid Form III of Compound **1** according to claim 11 or 12, characterized by the following XRPD peaks at 2Θ angles: 4.8°, 9.7°, 10.3°, 13.9°, and 24.6°.

14. The solid Form III of Compound **1** according to any one of claims 11 to 13, characterized by least four ^{13}C solid-state nuclear magnetic resonance peaks at chemical shifts selected from 156.6 ppm, 134.2 ppm, 46.0 ppm, 25.5 ppm, and 14.3 ppm.

15. The solid Form III of Compound **1** according to any one of claims 11 to 14, characterized by the following ^{13}C solid-state nuclear magnetic resonance peaks at chemical shifts: 156.6 ppm, 134.2 ppm, 46.0 ppm, 25.5 ppm, and 14.3 ppm.

16. A method of making solid Form I according to Compound **1** of claim 1, comprising:
    (a) heating Compound **1** and tert-butyl methyl ether (TBME) or water to provide a slurry;
    (b) cooling the slurry of step (a); and
    (c) collecting the resulting solids as Form I of Compound 1.

17. The method of claim 16, wherein an amorphous form of Compound **1** is used in step (a).

18. A method of making Form II of Compound **1** according to claim 7, comprising:
(a) heating a mixture of Compound **1** and 2-propanol to 70 °C to provide a solution;
(b) filtering the solution of step (a);
(c) cooling the filtrate from step (b) to 55°C;
(d) treating the cooled solution of step (c) with water;
(e) cooling the water-treated mixture of step (d) to 20°C; and
(f) collecting the resulting solids as Form II of Compound **1**.

19. The method of claim 18, further comprising
(d1) seeding the water-treated solution of step (d);
(d2) mixing the seeded solution at 55°C; and
(d3) treating the seeded solution with water before cooling to 20°C.

20. The method of claim 18 or 19, wherein an amorphous form of Compound **1** or a mixture of Form I and Form II of Compound **1** is used in step (a).

21. A method of making solid Form III of Compound **1** according to claim 11, comprising:
(a) heating a mixture of Compound **1** and methanol to 50-55°C to provide a solution;
(b) concentrating the solution of step (a) at 40-45°C;
(c) cooling the concentrated solution from step (b) to 25°C; and
(d) collecting the resulting solids as Form III of Compound **1**.

22. The method of claim 21, wherein an amorphous form of Compound **1** is used in step (a).

23. A pharmaceutical composition comprising the solid form of Compound **1** according to any one of claims 1 to 15, optionally together with one or more inert carriers and/or diluents.

24. A solid form of Compound **1** according to any one of claims 1 to 15 or a pharmaceutical composition according to claim 23 for use in the prevention and/or

treatment of a neurological or psychiatric disorder.

25. The solid form of Compound **1** or the pharmaceutical composition for use according to claim 24, wherein the neurological or psychiatric disorder is selected from positive and negative symptoms of schizophrenia, cognitive impairment associated with schizophrenia, and Alzheimer's Disease.

26. Use of the solid form of Compound **1** according to any one of claims 1 to 15 or the pharmaceutical composition according to claim 23 in the manufacture of a medicament for the treatment or prevention of a neurological or psychiatric disorder.

27. The use according to claim 26, wherein the neurological or psychiatric disorder is selected from positive and negative symptoms of schizophrenia, cognitive impairment associated with schizophrenia, and Alzheimer's Disease.