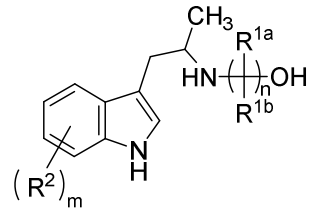
CLAIMS

1. A process for the preparation of a compound of formula (II):



(II)

or a stereoisomer or salt thereof

each of R^{1a} and R^{1b} is independently hydrogen, halogen, unsubstituted C_{1-3} alkyl, unsubstituted C_{1-3} haloalkyl, unsubstituted C_{1-3} alkoxy, -CN, unsubstituted C_{3-6} cycloalkyl, or unsubstituted C_{3-6} spirocycloalkyl;

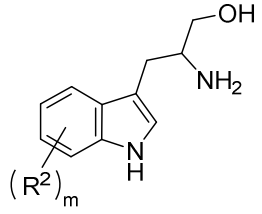
each R^2 is independently halogen, hydroxyl, -CN, unsubstituted C_{1-3} alkyl, unsubstituted C_{1-3} haloalkyl, or unsubstituted C_{1-3} alkoxy;

m is 0, 1 or 2; and

n is 1, 2, or 3;

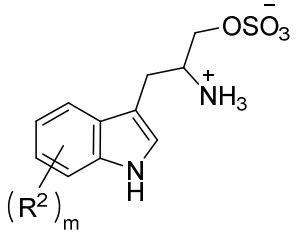
the process comprising:

(a) contacting a compound of formula (III),



(III)

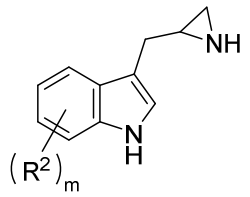
or a stereoisomer or salt thereof with a sulfonic acid to form a compound of formula (IIIa);



(IIIa)

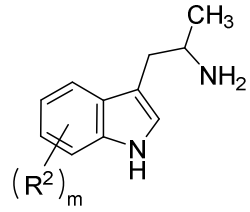
or a stereoisomer or salt thereof

(b) contacting the compound of formula (IIIa) or a stereoisomer or salt thereof with a base to form compound of formula (IV);


(IV)

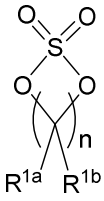
or a stereoisomer or salt thereof

(c) hydrogenating the compound of formula (IV) or a stereoisomer or salt thereof to form a compound of formula (V); and


(V)

or a stereoisomer or salt thereof

(d) contacting the compound of formula (V) or a stereoisomer or salt thereof with a compound of formula (VI);


(VI)

thereby forming a compound of formula (II) or a stereoisomer or salt thereof.

2. The process of claim 1, wherein the compound of formula (III) is a compound of formula (III*).

3. The process of claim 2, wherein the compound of formula (III*) is a compound of formula (3*), (3x*), (3y*), or (3z*).

4. The process of claim 2, wherein the compound of formula (III*) is a compound of formula (3*).

5. The process of any one of claims 1-4, wherein the sulfonic acid is H_2SO_4 or $ClSO_3H$.

6. The process of any one of claims 1-5, wherein the base is a hydroxide base.

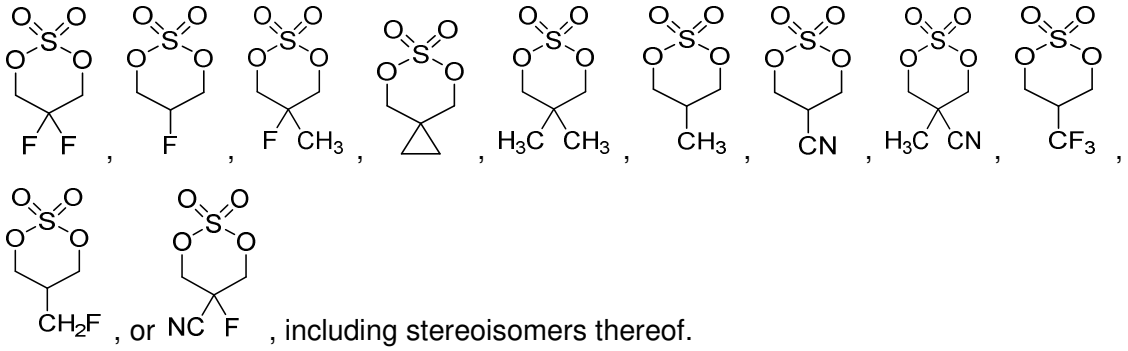
7. The process of claim 6, wherein the base is KOH, NaOH, or LiOH.

8. The process of any one of claims 1-7, wherein the hydrogenation is performed using a catalyst comprising Pd, Pt, or Ni.

9. The process of claim 8, wherein the catalyst is Pd/C, Pt/C, or Raney Ni.

10. The process of any one of claims 1-9, wherein the hydrogenation is performed using catalytic transfer hydrogenation in the presence of isopropanol, formic acid, formate, or ammonium.

11. The process of any one of claims 1-10, wherein the compound of formula (VI) is:



, including stereoisomers thereof.

12. The process of any one of claims 1-10, wherein R^{1a} and R^{1b} are independently hydrogen, halogen, cyano, unsubstituted C_{1-3} alkyl, or cyclopropyl.

13. The process of any one of claims 1-10, wherein R^{1a} and R^{1b} are independently hydrogen, halogen, or methyl.

14. The process of any one of claims 1-10, wherein R^{1a} is hydrogen and R^{1b} is halogen, methyl, cyano, or cyclopropyl.

15. The process of any one of claims 1-10, wherein R^{1a} is hydrogen and R^{1b} is halogen.

16. The process of any one of claims 1-10, wherein R^{1a} is hydrogen and R^{1b} is methyl.

17. The process of any one of claims 1-10, wherein R^{1a} is methyl and R^{1b} is halogen, methyl, cyano, or cyclopropyl.

18. The process of any one of claims 1-10, wherein R^{1a} is halogen and R^{1b} is halogen, methyl, cyano, or cyclopropyl.

19. The process of any one of claims 1-10, wherein R^{1a} and R^{1b} are independently halogen, or methyl.

20. The process of any one of claims 1-10, wherein R^{1a} is halogen and R^{1b} is methyl.

21. The process of any one of claims 1-10, wherein R^{1a} is halogen and R^{1b} is halogen.

22. The process of any one of claims 1-10, wherein R^{1a} and R^{1b} are F.

23. The process of any one of claims 1-10, wherein each R^2 is independently hydrogen, halogen, hydroxyl, -CN, or C_{1-3} alkyl.

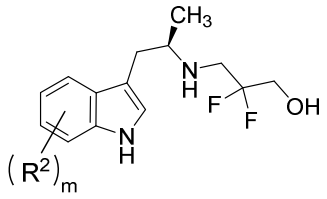
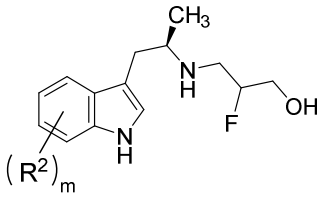
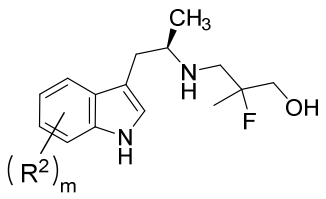
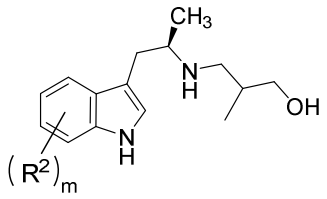
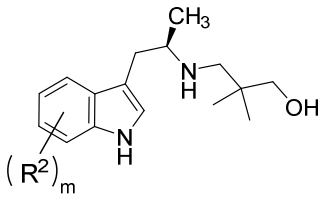
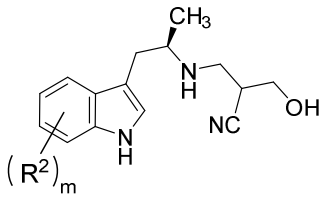
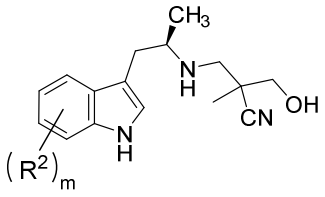
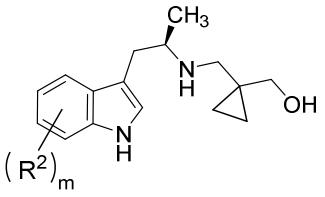
24. The process of any one of claims 1-10 or 12-23, wherein m is 0.

25. The process of any one of claims 1-10 or 12-23, wherein m is 1.

26. The process of any one of claims 1-10 or 12-23, wherein R^2 is halogen or C_{1-3} alkyl and m is 1.

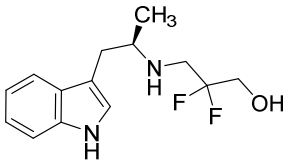
27. The process of any one of claims 1-10 or 12-23, wherein R^2 is halogen and m is 1.

28. The process of any one of claims 1-10 or 12-23, wherein the compound of formula (II) is:


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, or

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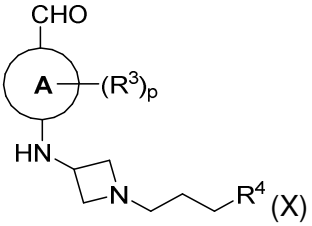
or a stereoisomer or salt thereof.

29. The process of any one of claims 1-10, wherein the compound of formula (II) is:


(2)

or a salt thereof.

30. The process of any one of claims 1-10 or 12-29, wherein the compound of formula (II) is contacted with a compound having formula (X):


(X)

or a stereoisomer or salt thereof

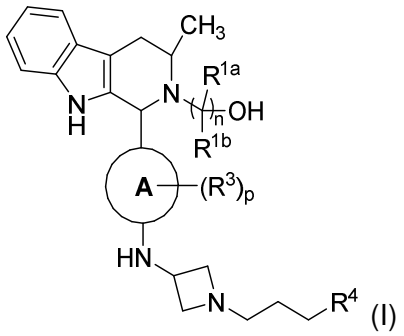
ring A is phenyl or pyridinyl;

each R^3 is independently hydrogen, halogen, or C_{1-3} alkyl,

R^4 is halogen or -CN; and

p is 1 or 2;

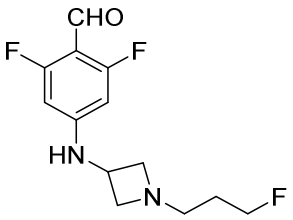
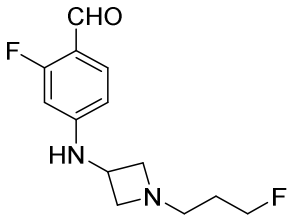
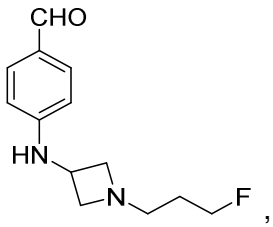
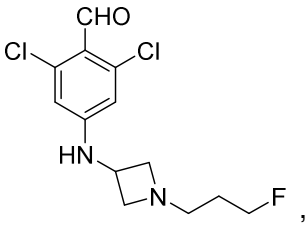
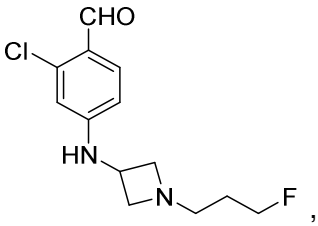
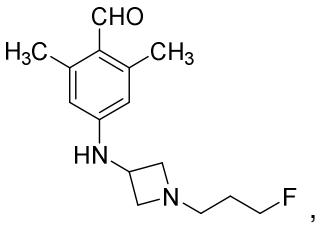
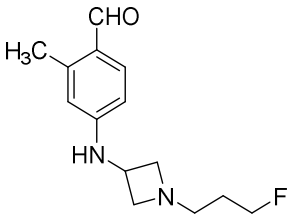
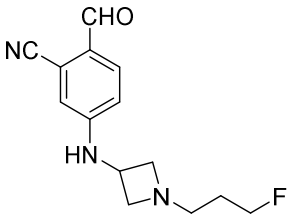
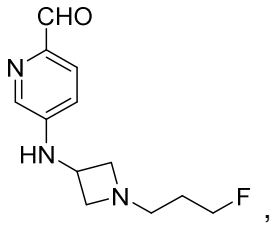
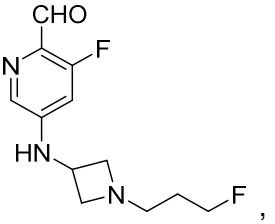
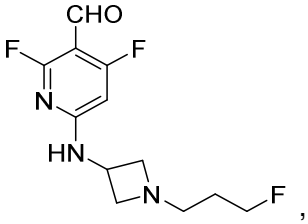
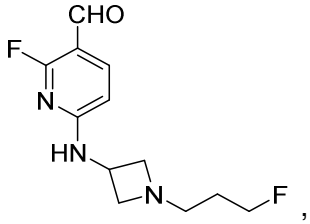
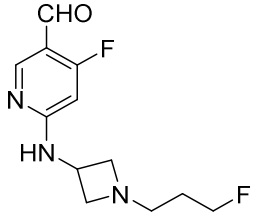
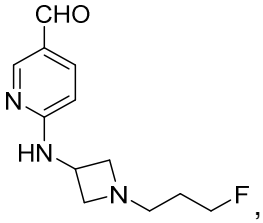
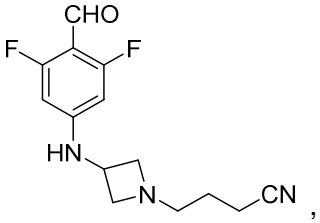
to form a compound of formula (I):

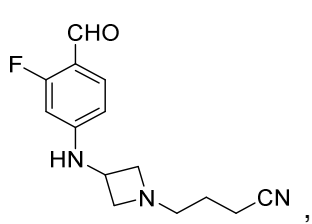


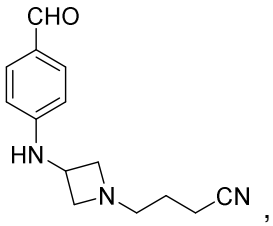
(I)

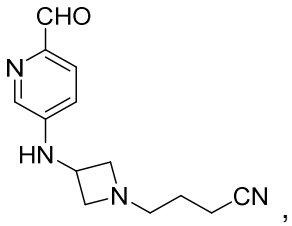
or a stereoisomer or pharmaceutically acceptable salt thereof.

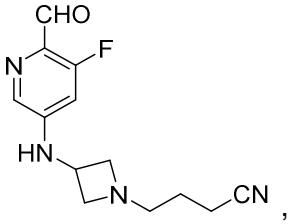
31. The process of claim 30, wherein the compound of formula (X) is:

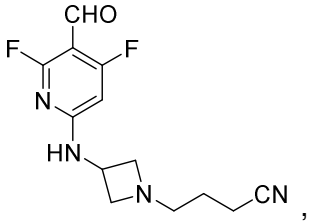

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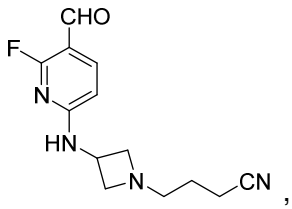


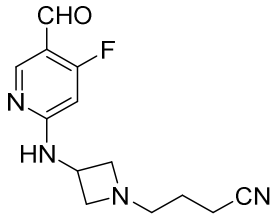
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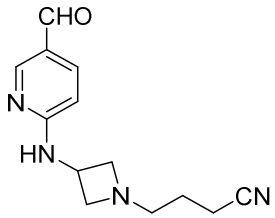
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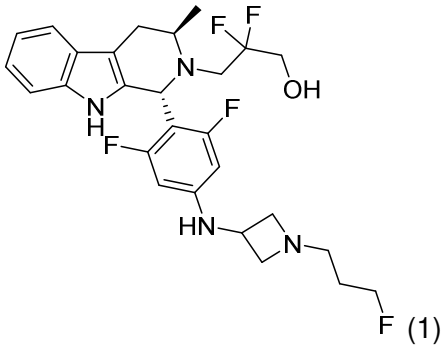
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, or


, or a salt thereof.

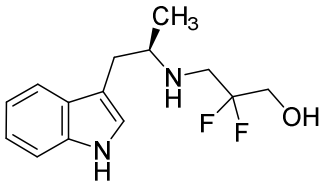
32. A process for the synthesis of a compound having the formula (1), the process comprising:



(1)

or a pharmaceutically acceptable salt thereof.

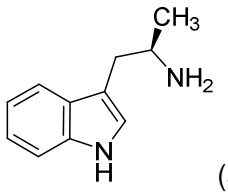
(a) contacting a compound of formula (2)



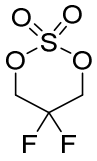
(2)

or a salt thereof

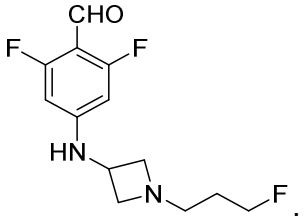
wherein the compound of formula (2) is synthesized according to the process of claim 1 and wherein the compound of formula (V) has formula (5)


(5)

or a salt thereof and the compound of formula (VI) has formula (6):

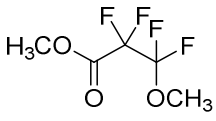
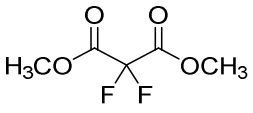

(6)

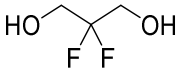
(b) with a compound of formula (10)

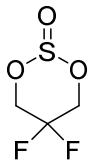

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or a salt thereof thereby making a compound of formula (1) or a pharmaceutically acceptable salt thereof.

33. The process of claim 32, wherein the compound of formula (6) is prepared by:

(a) contacting a compound of formula (12a)  (12a) with H_2SO_4 to make a compound of formula  (12b);

(b) reducing the compound of formula (12b) to make a compound of formula  (12c);

(c) cyclizing the compound of formula (12c) in the presence of $SOCl_2$ to make the compound of formula  (12d); and

(d) contacting the compound of formula (12d) with $FeCl_3$, NaOCl and a base, thereby making the compound of formula (6).