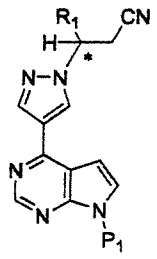
Claims:

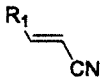
1. A process of preparing a composition comprising a racemate of a compound of Formula Ia:



Ia

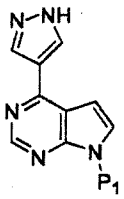
comprising:

a) treating a composition comprising an enantiomeric excess of the (R)- or (S)-enantiomer of a compound of Formula Ia with a compound of Formula D-1:



D-1

in the presence of a first base under conditions sufficient to form a compound of Formula IV:



IV

and

(b) reacting a compound of Formula IV with a compound of Formula D-1 in the presence of a second base;

wherein:

* is a chiral carbon;

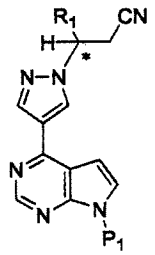
P_1 is a protecting group; and

R_1 is selected from C_{3-7} cycloalkyl, C_{1-6} alkyl, and C_{1-6} fluoroalkyl.

2. A process according to claim 1, wherein said first base is cesium carbonate.

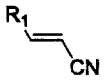
3. A process according to claim 1 or 2, wherein said second base is 1,8-diazabicyclo[5.4.0]undec-7-ene (DBU).

4. A process of preparing a composition comprising a racemate of a compound of Formula Ia:



Ia

comprising treating a composition comprising an enantiomeric excess of the (R)- or (S)-enantiomer of a compound of Formula Ia with a compound of Formula D-1:



D-1

in the presence of a base under conditions sufficient to form said racemate of said compound of Formula Ia;

wherein:

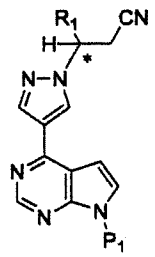
* is a chiral carbon;

P_1 is a protecting group; and

R_1 is selected from C_{3-7} cycloalkyl, C_{1-6} alkyl, and C_{1-6} fluoroalkyl.

5. A process according to claim 4, wherein said base is potassium t-butoxide.

6. A process according to any one of claims 1 to 5, further comprising preparing a composition comprising an enantiomeric excess of the (R)- or (S)-enantiomer of a compound of Formula Ia:



comprising passing a composition comprising a racemate of a compound of Formula Ia through a chiral chromatography unit using a mobile phase and collecting a composition comprising an enantiomeric excess of the (R)- or (S)-enantiomer of a compound of Formula Ia;

wherein:

* is a chiral carbon;

R_1 is selected from C_{3-7} cycloalkyl, C_{1-6} alkyl, and C_{1-6} fluoroalkyl; and

P_1 is a protecting group.

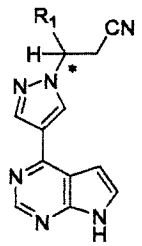
7. A process according to claim 6, wherein the mobile phase comprises isopropanol and hexanes, wherein said isopropanol is present in an amount of about 25% to about 10% by volume.

8. A process according to claim 6 or 7, wherein said chromatography unit is a stimulated moving bed (SMB) chromatography unit equipped with a set of eight columns or a chiral column unit, wherein each column is packed with a chiral stationary phase.

9. A process according to any one of claims 1 to 8, wherein P_1 is $-CH_2OC(=O)C(CH_3)_3$ or $-CH_2OCH_2CH_2Si(CH_3)_3$.

10. A process according to any one of claims 1 to 9, wherein R_1 is cyclopentyl.

11. A process according to any one of claims 6 to 10, further comprising reacting said compound of Formula Ia under deprotection conditions to form a compound of Formula III:



III

wherein:

* is a chiral carbon;

R_1 is selected from C_{3-7} cycloalkyl, C_{1-6} alkyl, and C_{1-6} fluoroalkyl; and

P_1 is a protecting group.

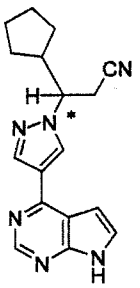
12. A process according to claim 11, wherein P_1 is $-CH_2OC(=O)C(CH_3)_3$ or $-CH_2OCH_2CH_2Si(CH_3)_3$.

13. A process according to claim 11 or 12, wherein R_1 is cyclopentyl.

14. A process according to claim 11 or 12, wherein said compound of Formula III is (3R)-3-cyclopentyl-3-[4-(7H-pyrrolo[2,3-d]pyrimidin-4-yl)-1H-pyrazol-1-yl]propanenitrile.

15. A process according to any one of claims 11 to 14, further comprising reacting the compound of Formula III with phosphoric acid to form a phosphate salt of said compound of Formula III.

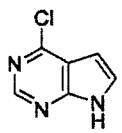
16. A process of preparing a composition comprising an enantiomeric excess of the (R)-enantiomer of a compound of Formula III':



III'

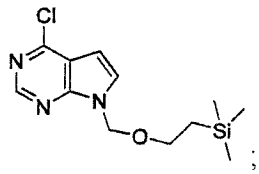
comprising:

(a) treating a compound of Formula XI':



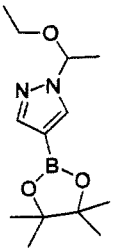
XI'

with sodium hydride and 2-(trimethylsilyl)ethoxymethyl chloride to form a compound of Formula X":



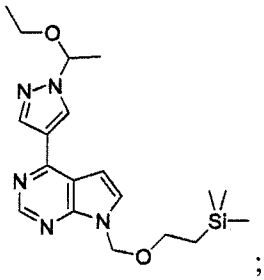
X"

(b) treating said compound of Formula X" with a compound of Formula XIII':



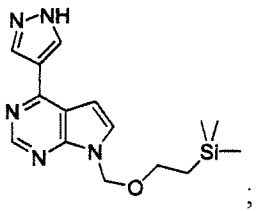
XIII'

in the presence of Pd(triphenylphosphine)$_4$, potassium carbonate, and a solvent, to form a compound of Formula XII':



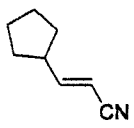
XII"

(c) reacting said compound of Formula XII" under deprotection conditions to form a compound of Formula IV":



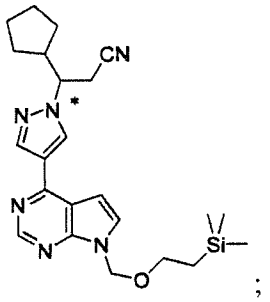
IV"

(d) reacting said compound of Formula IV" with a compound of Formula D-1':



D-1'

under conditions sufficient to form a composition comprising a racemate of a compound of Formula I":



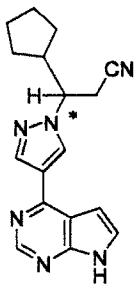
I"

(e) passing said composition comprising said racemate of said compound of Formula I" through a chiral chromatography unit using a mobile phase and collecting a composition comprising an enantiomeric excess of the (R)-enantiomer of said compound of Formula I"; and

(f) reacting said compound of Formula I" with lithium tetrafluoroborate, followed by aqueous ammonium hydroxide to form a composition comprising an enantiomeric excess of the (R)-enantiomer of said compound of Formula III';

wherein * is a chiral carbon.

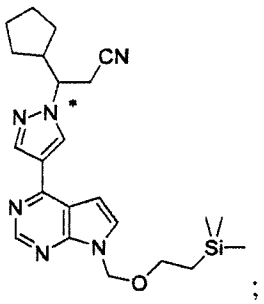
17. A process of preparing a composition comprising an enantiomeric excess of the (R)-enantiomer of a compound of Formula III':



III'

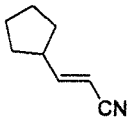
comprising:

(a) treating a composition comprising an enantiomeric excess of the (S)-enantiomer of a compound of Formula I":



I"

with a compound of Formula D-1':



D-1'

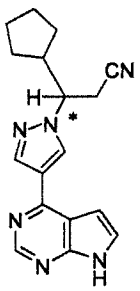
in the presence of cesium carbonate in acetonitrile under conditions sufficient to form the racemate of the compound of Formula I";

(b) passing said composition comprising said racemate of said compound of Formula I" through a chiral chromatography unit using a mobile phase and collecting a composition comprising an enantiomeric excess of the (R)-enantiomer of said compound of Formula I"; and

(c) reacting said compound of Formula I" with lithium tetrafluoroborate, followed by aqueous ammonium hydroxide to form a composition comprising an enantiomeric excess of the (R)-enantiomer of said compound of Formula III';

wherein * is a chiral carbon.

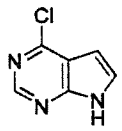
18. A process of preparing a composition comprising an enantiomeric excess of the (R)-enantiomer of a compound of Formula III':



III'

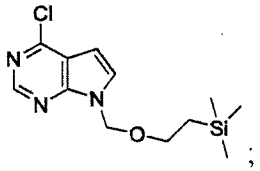
comprising:

(a) treating a compound of Formula XI':



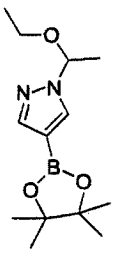
XI'

with sodium hydride and 2-(trimethylsilyl)ethoxymethyl chloride to form a compound of Formula X":



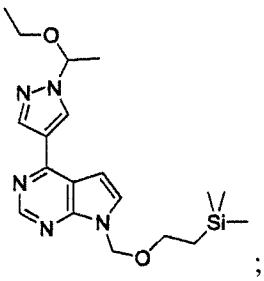
X"

(b) treating said compound of Formula X" with a compound of Formula XIII':



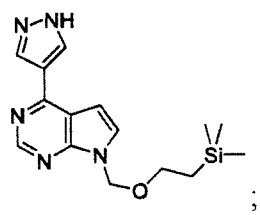
XIII'

in the presence of Pd(triphenylphosphine)$_4$, potassium carbonate, and a solvent, to form a compound of Formula XII":



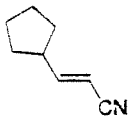
XII"

(c) reacting said compound of Formula XII" under deprotection conditions to form a compound of Formula IV":



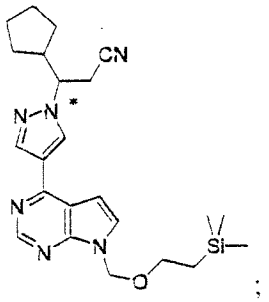
IV"

(d) reacting said compound of Formula IV" with a compound of Formula D-1':



D-1'

under conditions sufficient to form a composition comprising a racemate of a compound of Formula I":



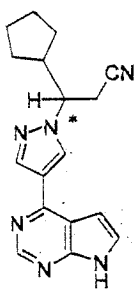
I"

(e) passing said composition comprising said racemate of said compound of Formula I" through a chiral chromatography unit using a mobile phase and collecting a composition comprising an enantiomeric excess of the (R)-enantiomer of said compound of Formula I"; and

(f) reacting said compound of Formula I" with boron trifluoride diethyl etherate, followed by aqueous ammonium hydroxide to form a composition comprising an enantiomeric excess of the (R)-enantiomer of said compound of Formula III';

wherein * is a chiral carbon.

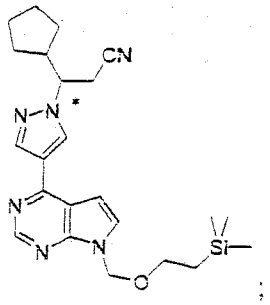
19. A process of preparing a composition comprising an enantiomeric excess of the (R)-enantiomer of a compound of Formula III':



III'

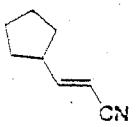
comprising:

(a) treating a composition comprising an enantiomeric excess of the (S)-enantiomer of a compound of Formula I':



I'

with a compound of Formula D-1':



D-1'

in the presence of cesium carbonate in acetonitrile under conditions sufficient to form the racemate of the compound of Formula I';

(b) passing said composition comprising said racemate of said compound of Formula I' through a chiral chromatography unit using a mobile phase and collecting a composition comprising an enantiomeric excess of the (R)-enantiomer of said compound of Formula I'; and

(c) reacting said compound of Formula I' with boron trifluoride diethyl etherate, followed by aqueous ammonium hydroxide to form a composition comprising an enantiomeric excess of the (R)-enantiomer of said compound of Formula III';

wherein * is a chiral carbon.