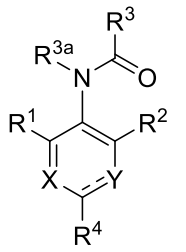
CLAIMS

1. A compound of formula (I):



(I)

;

or a pharmaceutically acceptable salt or solvate thereof;

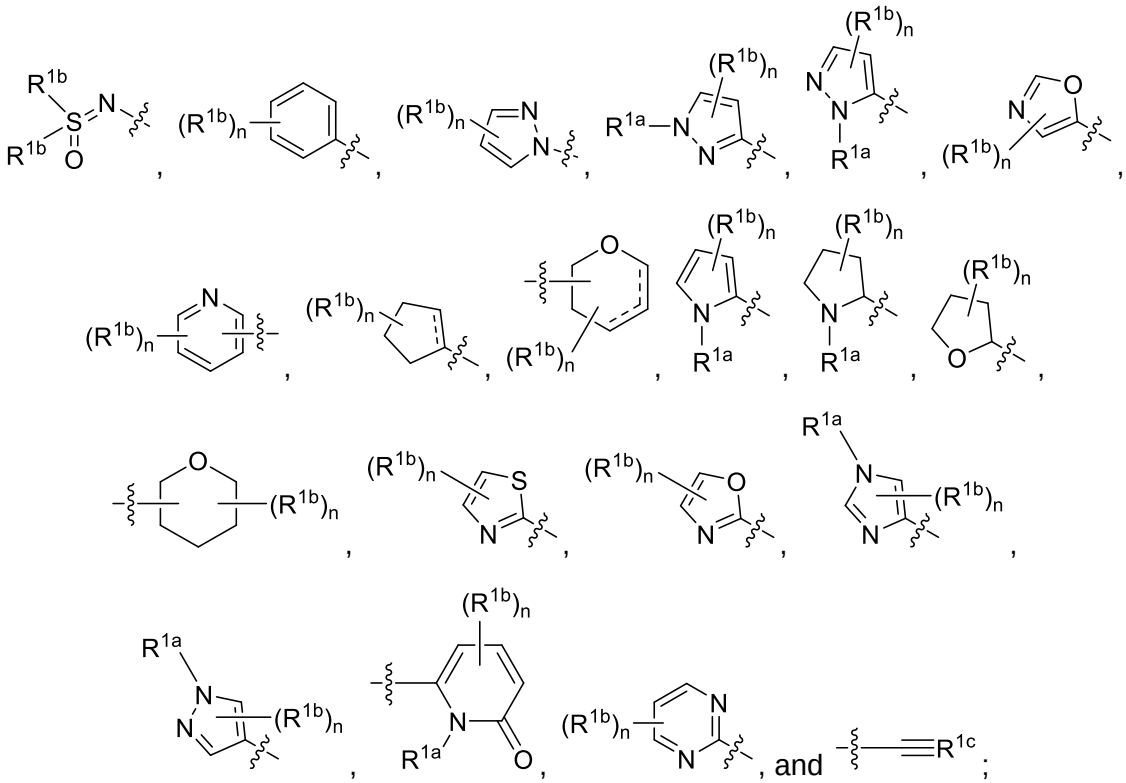
wherein:

$\cdots$ represents a double or single bond such that all valences are satisfied;

Y is N or NR^{4a};

X is $C(R^7)$ or N;

R^1 is selected from:



each occurrence of $\cdots$ independently represents a double or single bond such that all valences are satisfied;

n is 0, 1, 2, 3, 4, or 5;

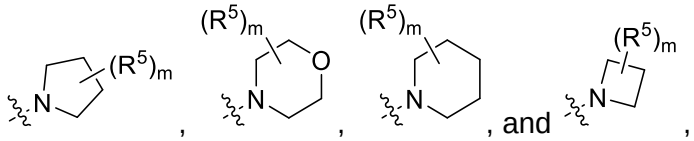
R^{1a} is hydrogen, or alkyl;

each R^{1b} is independently halo, alkyl, haloalkyl, cyano, heterocyclylalkyl, $–R^8–N(R^9)_2$, $–R^8–C(=O)N(R^9)_2$, or $–R^8$-OR^9;

or two R^{1b}'s attached to adjacent carbons, together with the carbons to which they are attached, form an optionally substituted *N*-heteroaryl, an optionally substituted *N*-heterocycylyl, an optionally substituted *O*-heterocycylyl, or an optionally substituted aryl; and

R^{1c} is N or -$Si(CH_3)_3$;

R^2 is selected from:



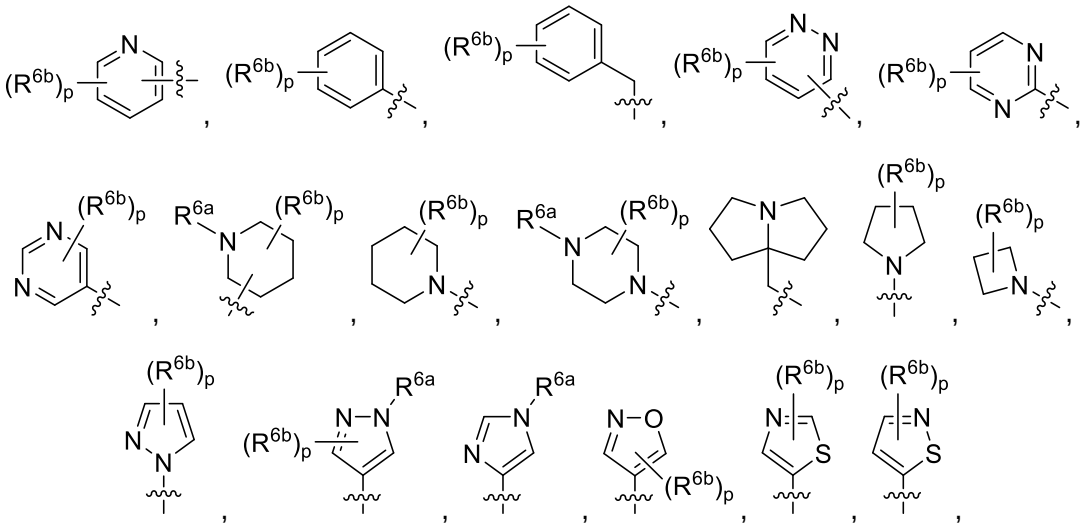
m is 0, 1, 2, 3, or 4;

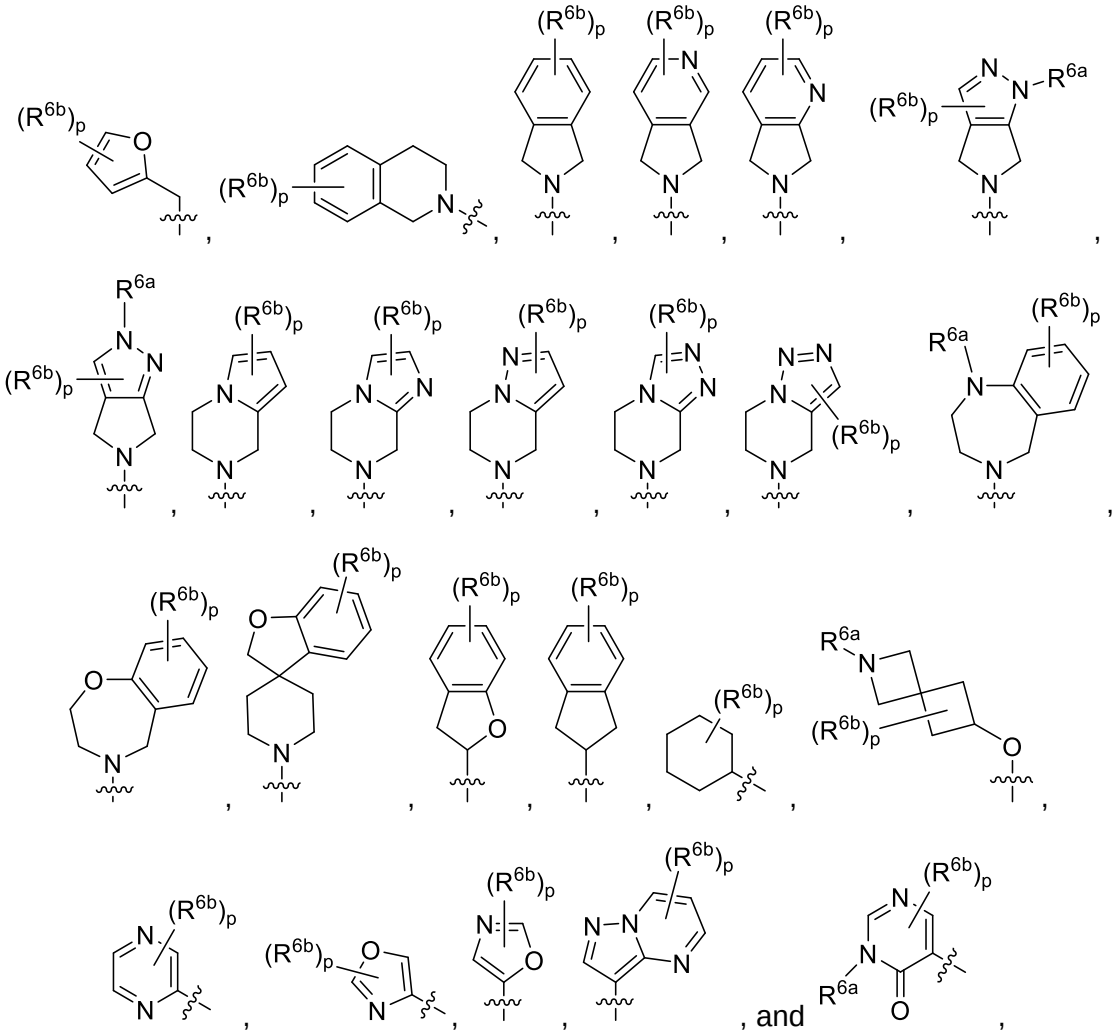
each R^5 is independently halo, alkyl, haloalkyl or $–R^{10}$-CN;

or two R^5's, together with the carbon to which they are both attached, form an optionally substituted *O*-heterocyclyl, an optionally substituted *N*-heterocyclyl, an optionally substituted cycloalkyl,

or two R^5's join to form an optionally substituted alkylene chain;

R^3 is selected from alkyl, $–R^8–N(R^9)_2$, $–R^8–OR^9$,





p is 0, 1, 2, 3, 4, or 5;

R^{6a} is hydrogen, alkyl, cycloalkyl, haloalkyl, -C(=O)R^9, optionally substituted arylalkyl, or optionally substituted heteroaryl;

each R^{6b} is independently alkyl, halo, haloalkyl, -R^8-OR^9, –R^8–N(R^9)$_2$, -R^8-C(=O)OR^9, -R^8-C(=O)N(R^9)$_2$,optionally substituted cycloalkyl, optionally substituted aryl, optionally substituted heterocyclyl, or optionally substituted heteroaryl;

or two R^{6b}'s, together with the carbon to which they are both attached, form an optionally substituted *N*-heterocyclyl, an optionally substituted *O*-heterocyclyl, an optionally substituted cycloalkyl,

or two R^{6b}'s join to form an optionally substituted alkylene chain;

or an occurrence of R^{6b} and an occurrence of R^{1b} join to form an optionally substituted alkylene chain;

R^{3a} is hydrogen or alkyl;

R^4 is selected from hydrogen, alkyl, -R^8-OR^9, halo, haloalkyl, and cyano;

or R^4 together with the carbon to which it is attached, joins with R^{4a} together with the nitrogen to which it is attached to form an optionally substituted 5-membered N-heteroaryl;

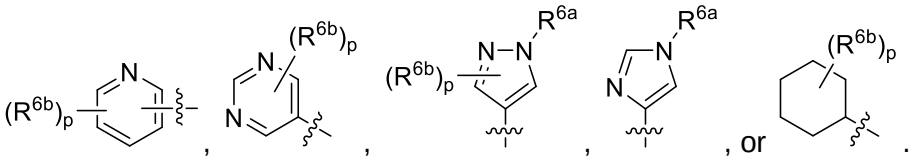
R^7 is selected from hydrogen, alkyl, halo, and –R^8-OR^9;

each R^8 is independently a direct bond or an optionally substituted alkylene chain;

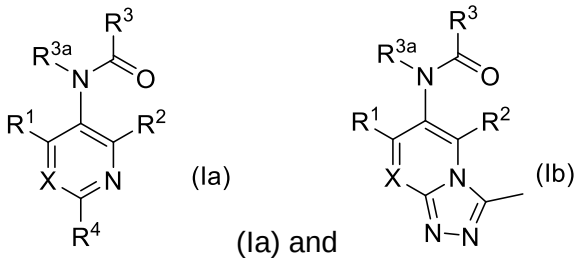
each R^9 is independently hydrogen, alkyl, haloalkyl, carboxyalkyl, optionally substituted cycloalkyl, optionally substituted cycloalkylalkyl, or optionally substituted aryl; or two R^9's, together with the nitrogen to which they are both attached, form an optionally substituted heterocyclyl;

provided that:

when X is N, R^3 is selected from:



2. The compound of claim 1, wherein the compound has the formula selected from:

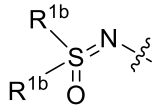
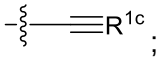


(Ia) and (Ib);

X, R^1, R^2, R^3, R^{3a}, and R^4 are each as defined above in claim 1; or a pharmaceutically acceptable salt, or solvate thereof.

3. The compound of claim 1 or claim 2, wherein:

R^1 is selected from:

 and ;

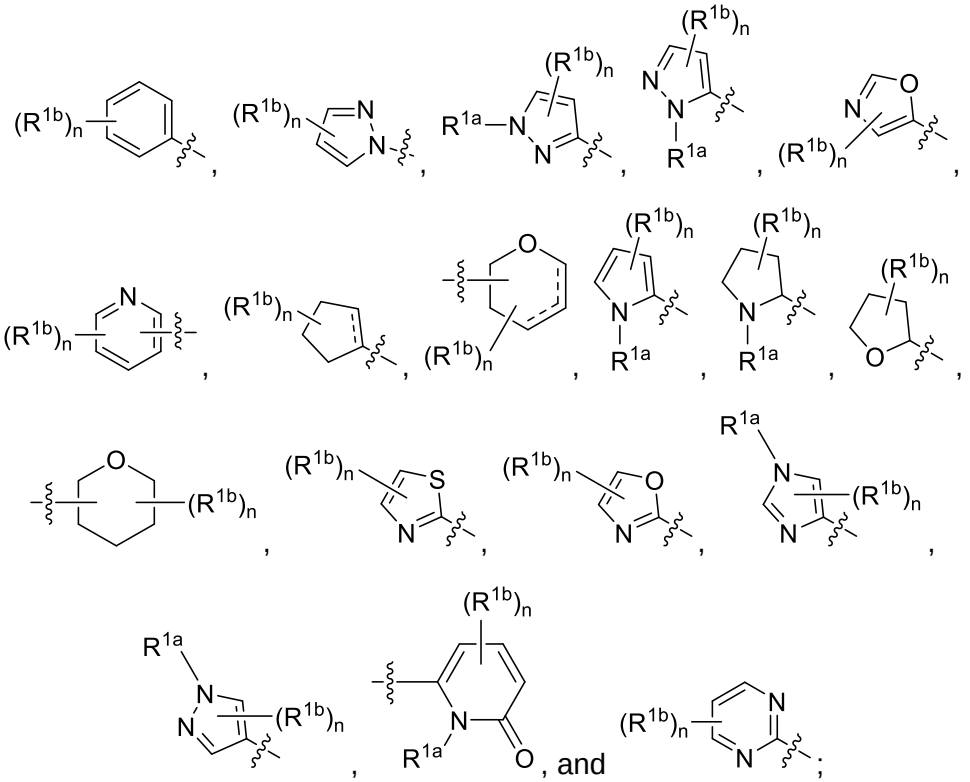
wherein:

each R^{1b} is independently halo, alkyl, haloalkyl, cyano, heterocyclylalkyl, $–R^8–N(R^9)_2$, $–R^8–C(=O)N(R^9)_2$, or $–R^8\text{-}OR^9$;

R^{1c} is N or $\text{-}Si(CH_3)_3$; or a pharmaceutically acceptable salt, or solvate thereof.

4. The compound of claim 1 or claim 2, wherein:

R^1 is selected from:



wherein:

each occurrence of ⎓ independently represents a double or single bond such that all valences are satisfied;

n is 0, 1, 2, 3, 4, or 5;

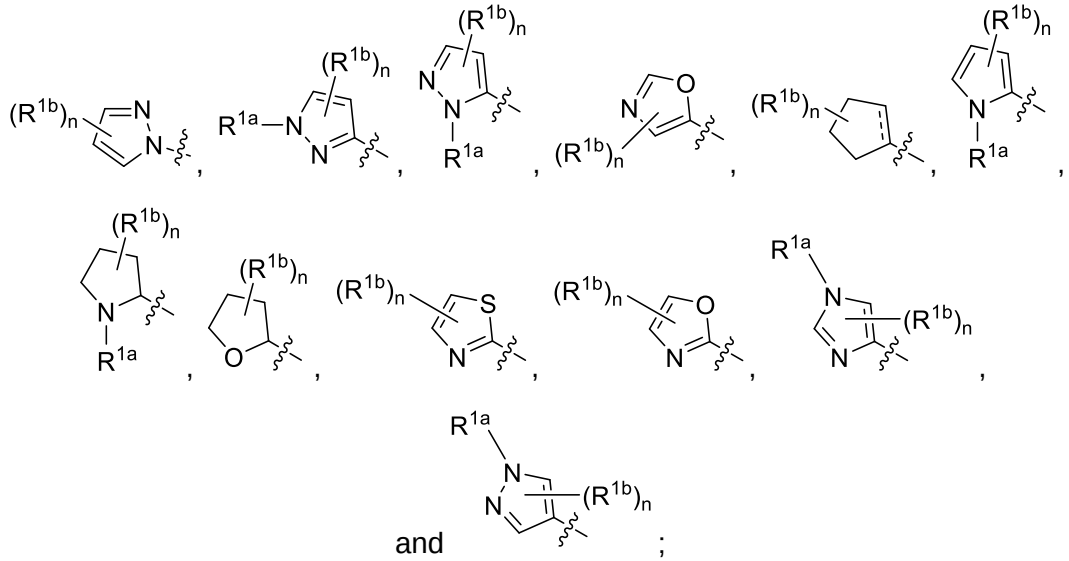
R^{1a} is hydrogen, or alkyl;

each R^{1b} is independently halo, alkyl, haloalkyl, cyano, heterocyclylalkyl, $–R^8–N(R^9)_2$, $–R^8–C(=O)N(R^9)_2$, or $–R^8\text{-}OR^9$;

or two R^{1b}'s attached to adjacent carbons, together with the carbons to which they are attached, form an optionally substituted *N*-heteroaryl, an optionally substituted *N*-heterocyclyl, an optionally substituted *O*-heterocyclyl, or an optionally substituted aryl; or a pharmaceutically acceptable salt, or solvate thereof.

5. The compound of claim 1 or claim 2, wherein:

R^1 is selected from:



; and

each occurrence of ⎓ independently represents a double or single bond such that all valences are satisfied;

n is 0, 1, 2, 3, 4, or 5;

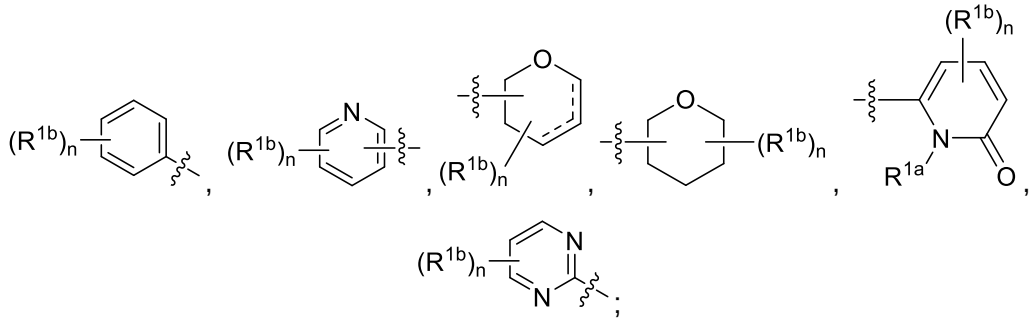
R^{1a} is hydrogen, or alkyl;

each R^{1b} is independently halo, alkyl, haloalkyl, cyano, heterocyclylalkyl, $–R^8–N(R^9)_2$, $–R^8–C(=O)N(R^9)_2$, or $–R^8\text{-}OR^9$;

or two R^{1b}'s attached to adjacent carbons, together with the carbons to which they are attached, form an optionally substituted *N*-heteroaryl, an optionally substituted *N*-heterocyclyl, an optionally substituted *O*-heterocyclyl, or an optionally substituted aryl; or a pharmaceutically acceptable salt, or solvate thereof.

6. The compound of claim 1 or claim 2, wherein:

R^1 is selected from:



each occurrence of ⎓ independently represents a double or single bond such that all valences are satisfied;

n is 0, 1, 2, 3, 4, or 5;

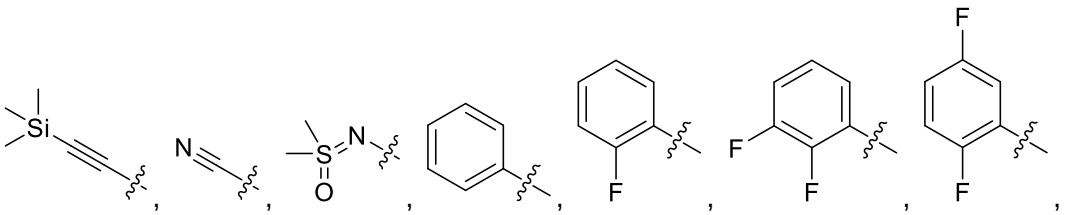
R^{1a} is hydrogen, or alkyl;

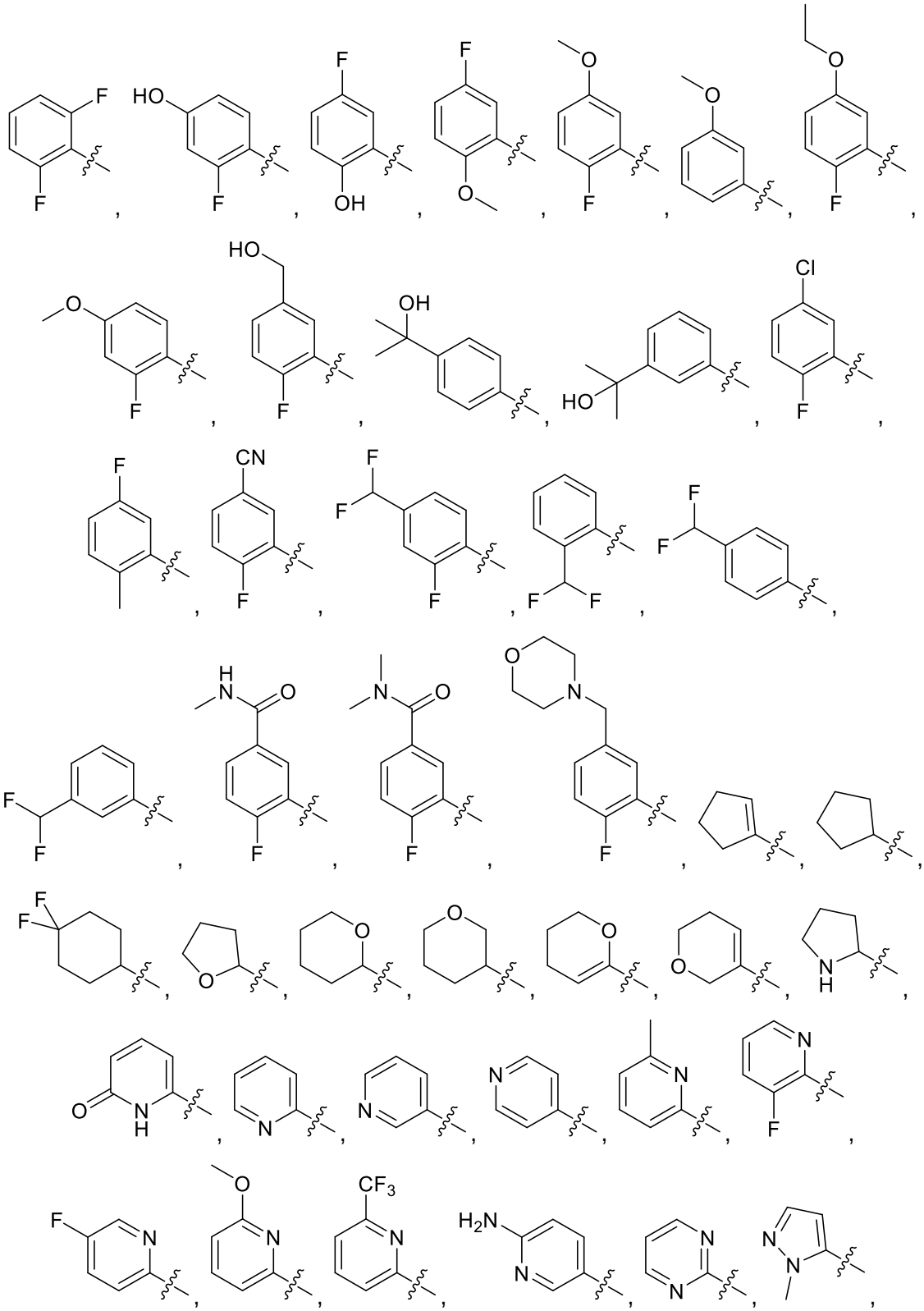
each R^{1b} is independently halo, alkyl, haloalkyl, cyano, heterocyclylalkyl, $–R^8–N(R^9)_2$, $–R^8–C(=O)N(R^9)_2$, or $–R^8$-OR^9;

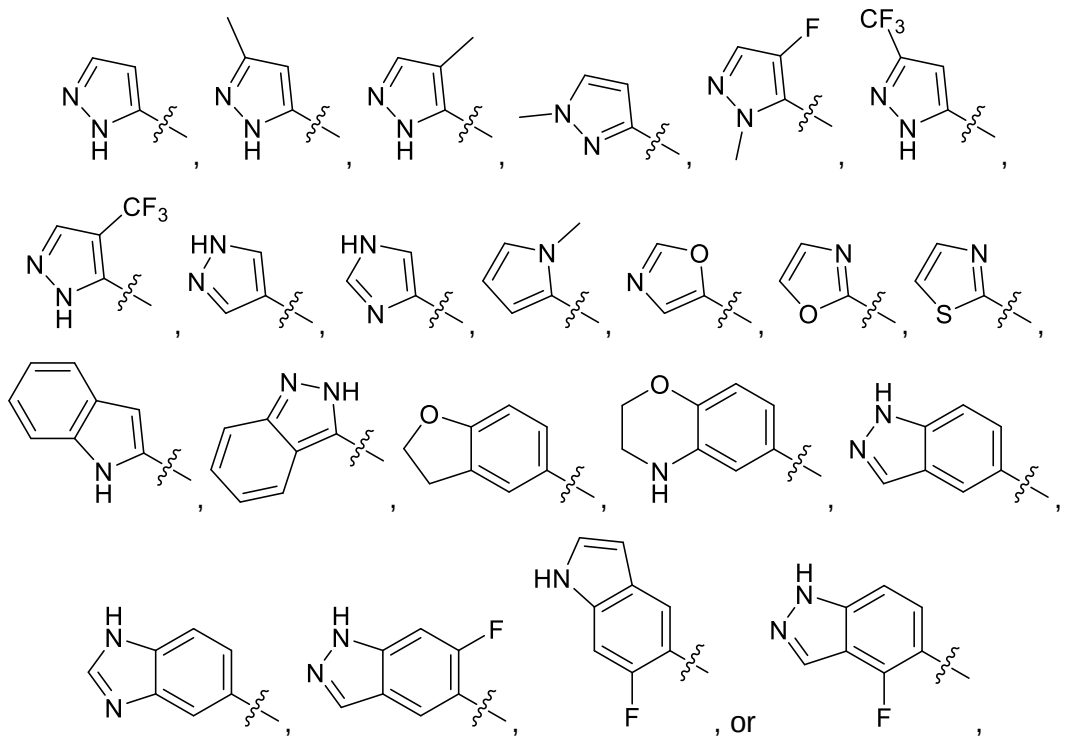
or two R^{1b}'s attached to adjacent carbons, together with the carbons to which they are attached, form an optionally substituted *N*-heteroaryl, an optionally substituted *N*-heterocyclyl, an optionally substituted *O*-heterocyclyl, or an optionally substituted aryl; or a pharmaceutically acceptable salt, or solvate thereof.

7. The compound of claim 1 or claim 2, wherein

R^1 has one of the following structures:



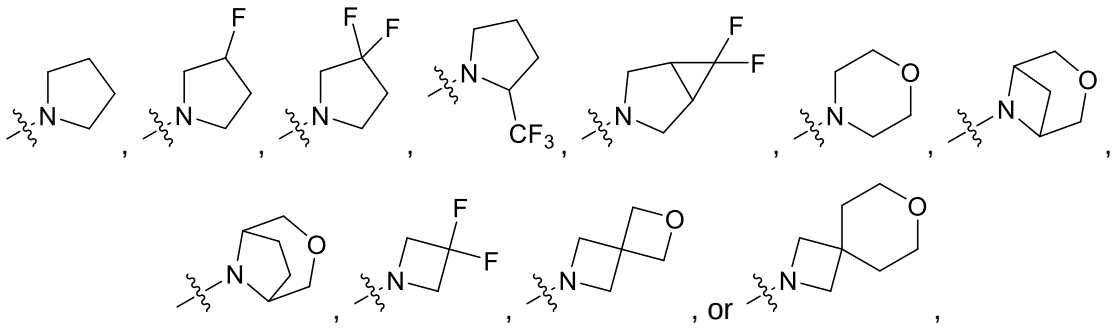




or a pharmaceutically acceptable salt, or solvate thereof.

8. The compound of any one of claims 1-7, wherein:

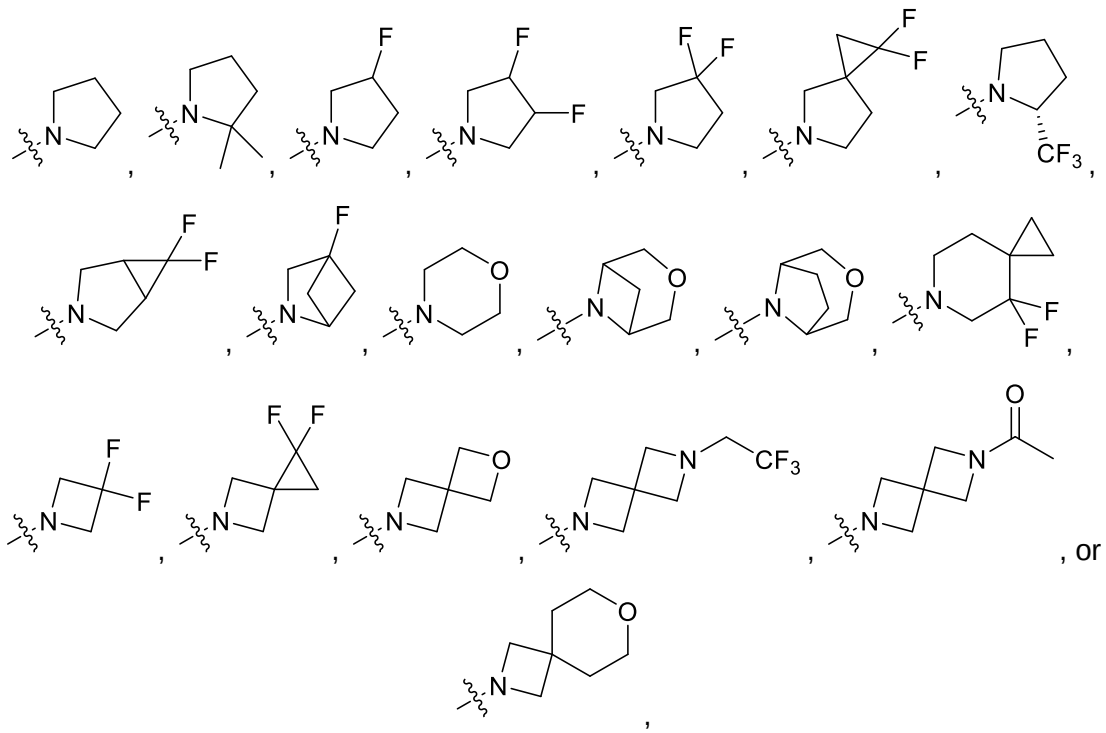
R^2 has one of the following structures:



or a pharmaceutically acceptable salt, or solvate thereof.

9. The compound of any one of claims 1-7, wherein:

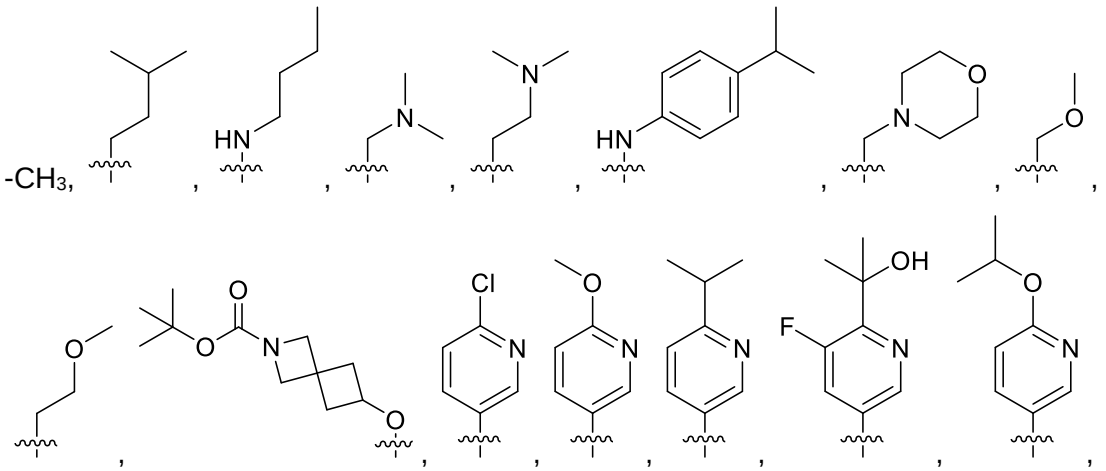
R^2 has one of the following structures:

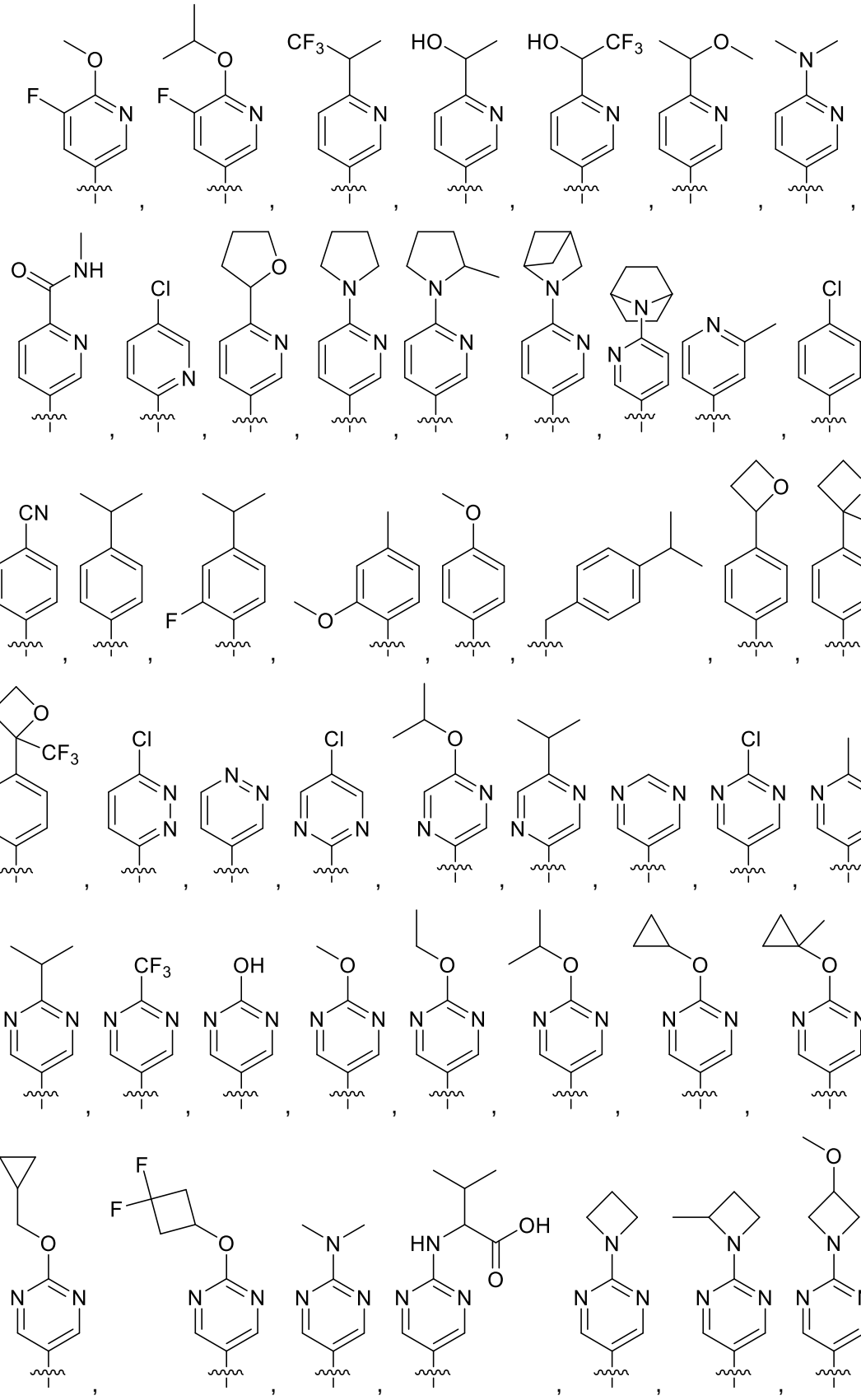


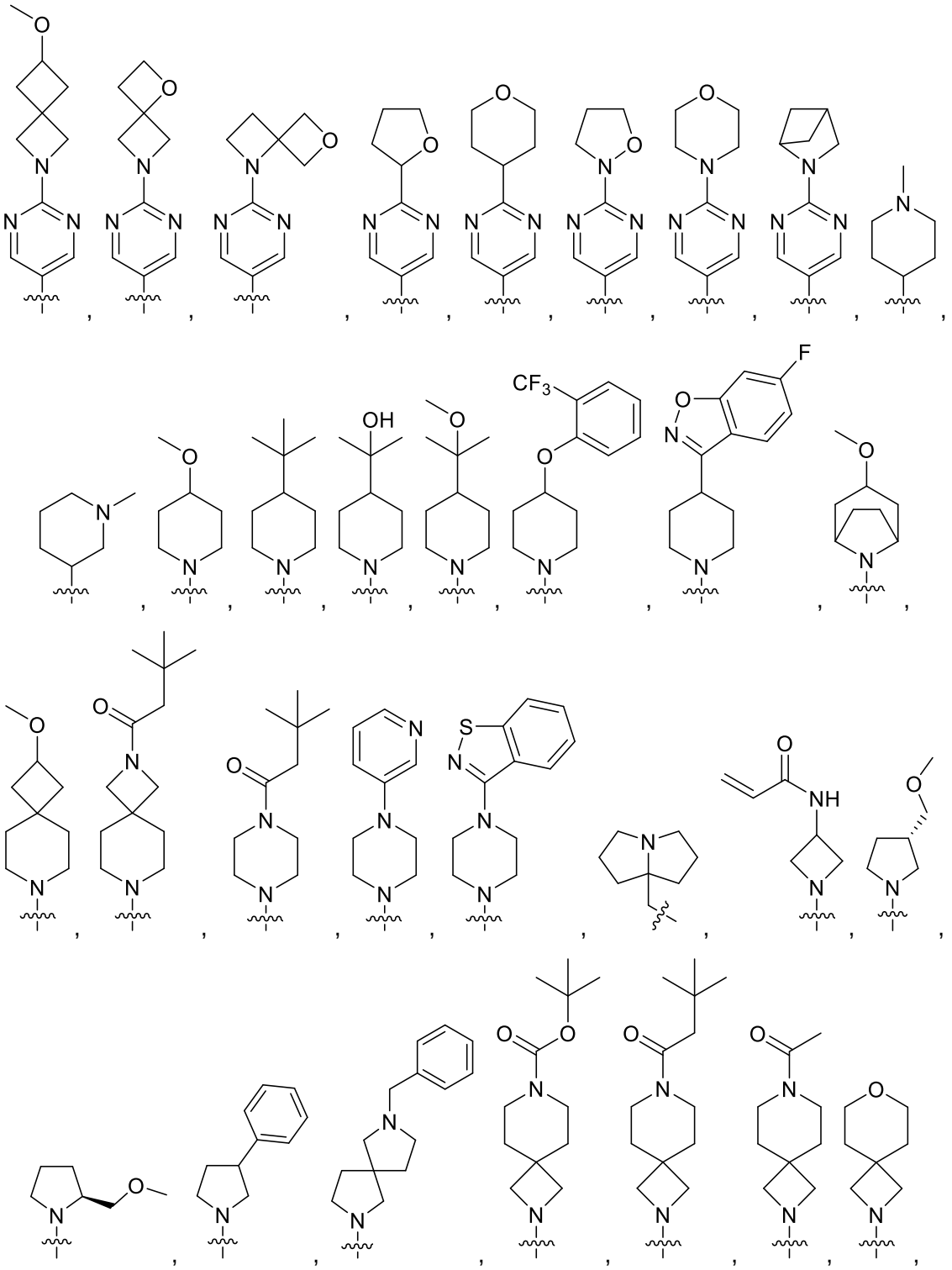
or a pharmaceutically acceptable salt, or solvate thereof.

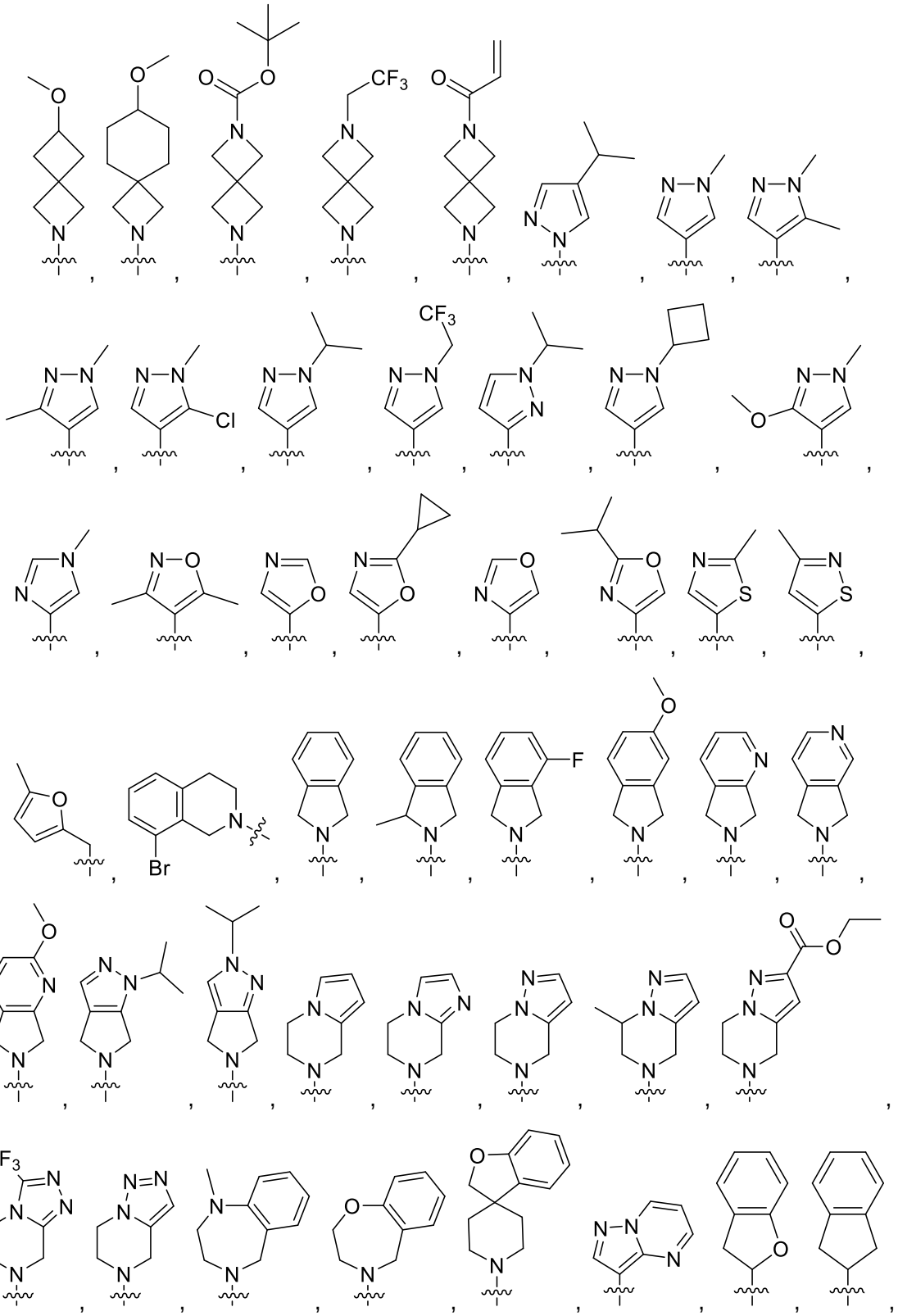
10. The compound of any one of claims 1-9, wherein:

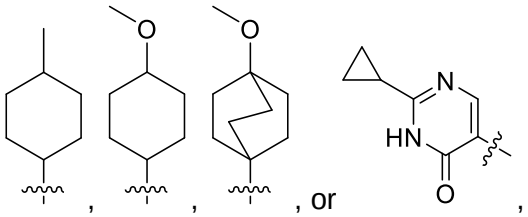
R^3 has one of the following structures:









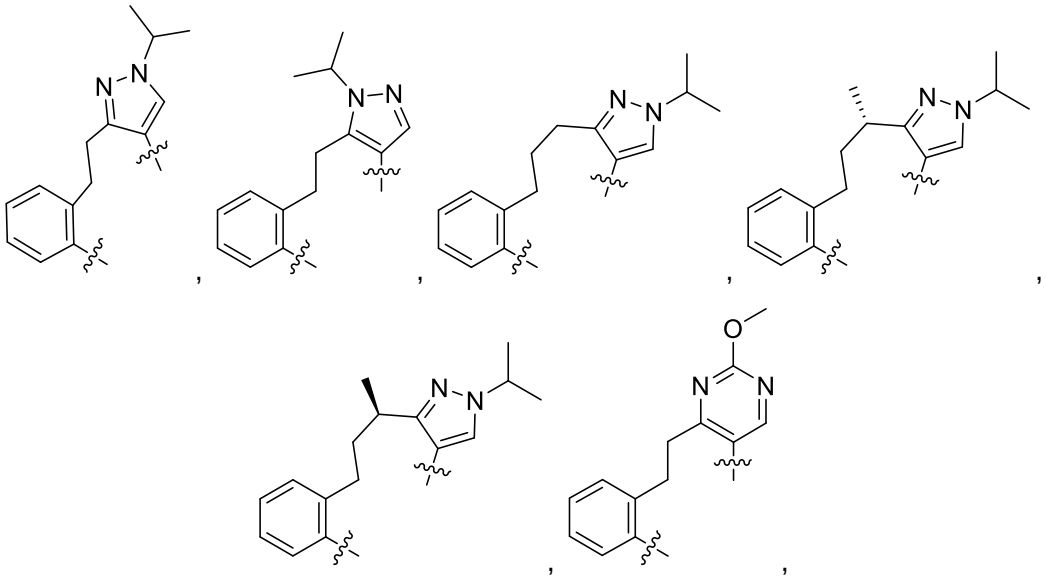


, , , or ,

or a pharmaceutically acceptable salt, or solvate thereof.

11. The compound of claim 1 or claim 2, wherein:

R^3 and R^1 together have one of the following structures:



, , , , , ,

or a pharmaceutically acceptable salt, or solvate thereof.

12. The compound of any one of claims 1-11, wherein:

R^{3a} is hydrogen or methyl; or a pharmaceutically acceptable salt, or solvate thereof.

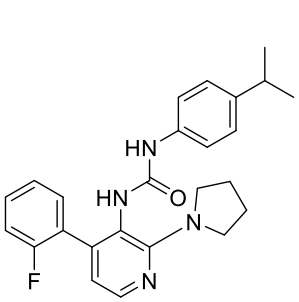
13. The compound of any one of claims 1-12, wherein:

R^4 is hydrogen, methyl, fluoro, chloro, -OH, $-OCH_3$, $-CF_3$, or cyano; or a pharmaceutically acceptable salt, or solvate thereof.

14. The compound of any one of claims 1-13, wherein:

R^7 is methyl; or a pharmaceutically acceptable salt, or solvate thereof.

15. The compound of claim 1, wherein the compound has one of the following structures:



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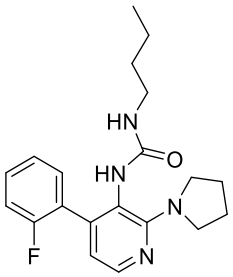

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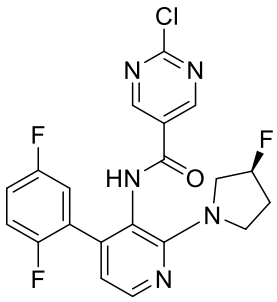

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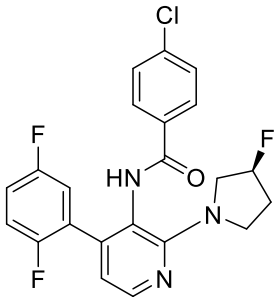

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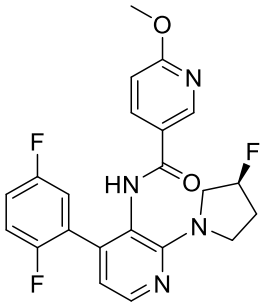

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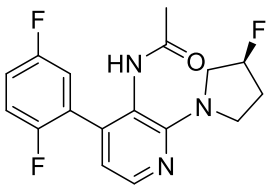

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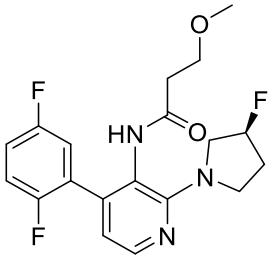

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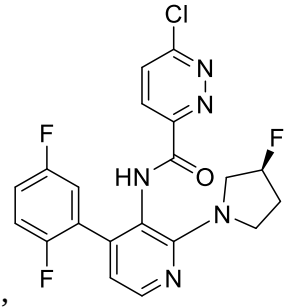

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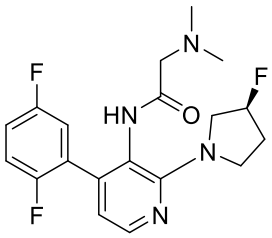

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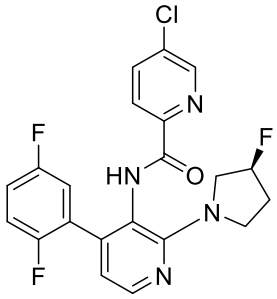

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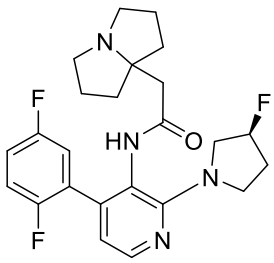

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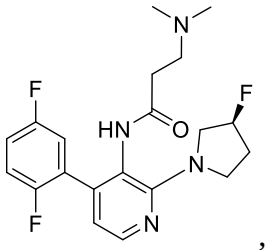

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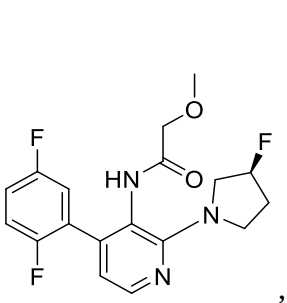
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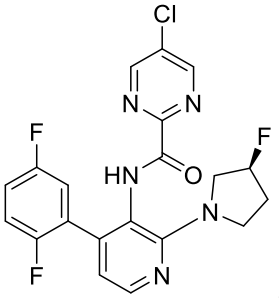
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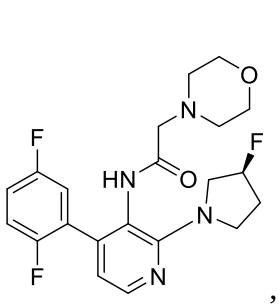
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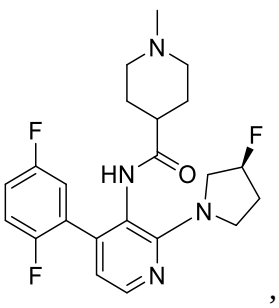
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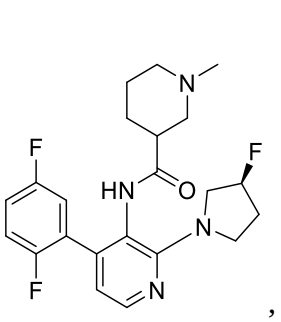
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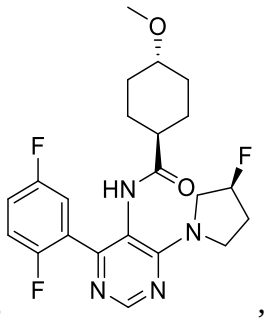
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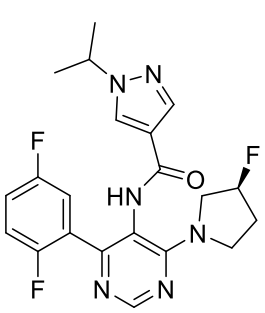
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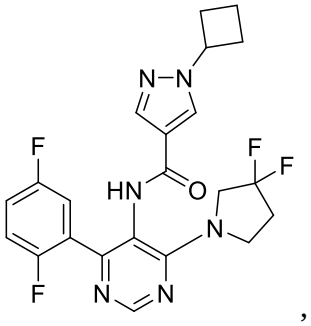
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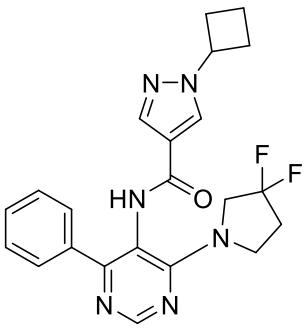
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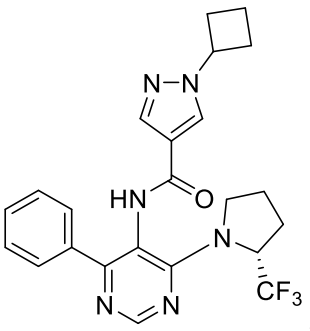
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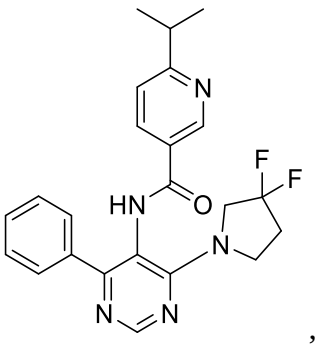
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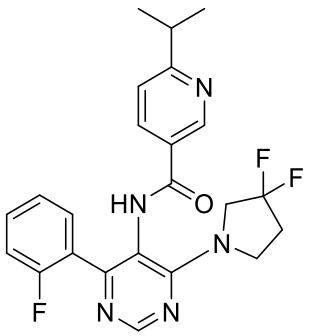
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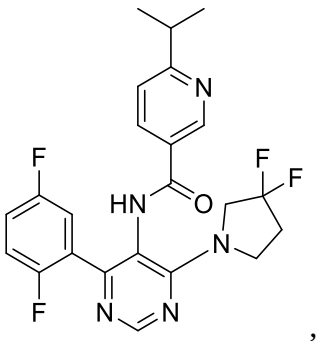
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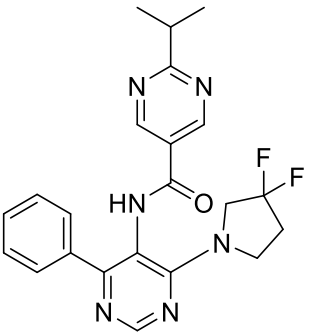
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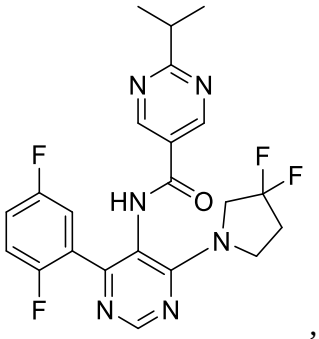
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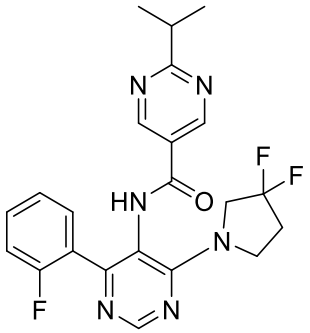
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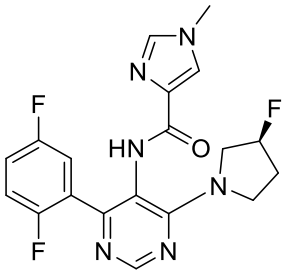
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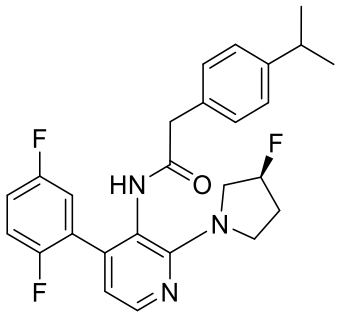
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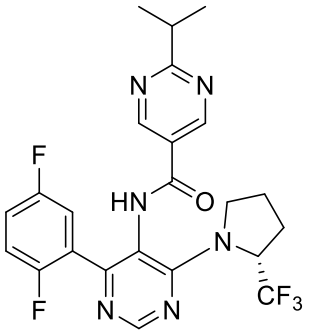
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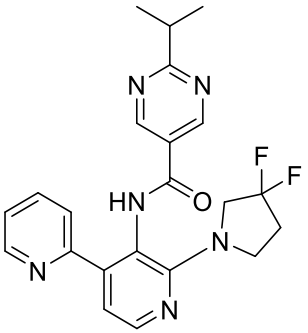
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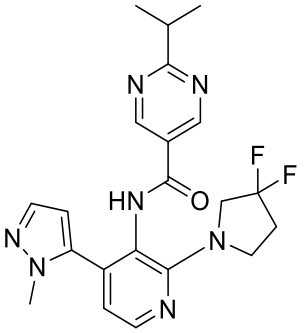
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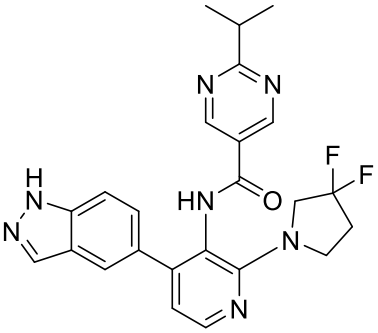
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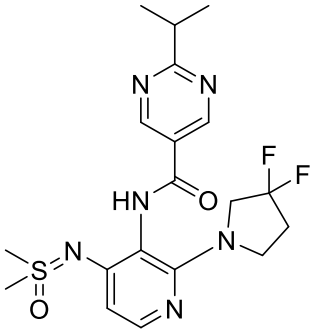
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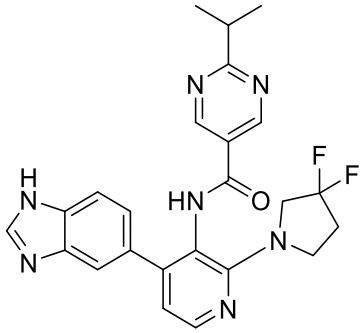
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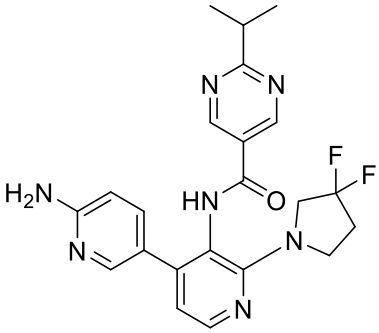
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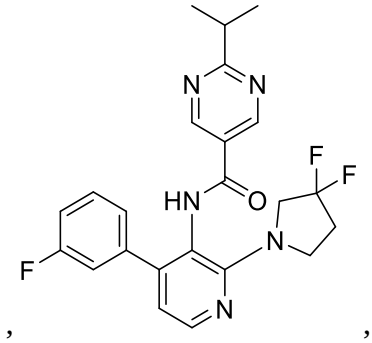
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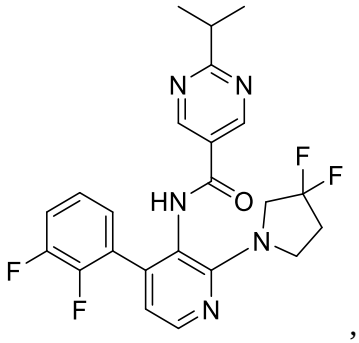
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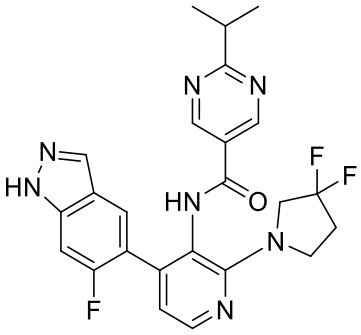
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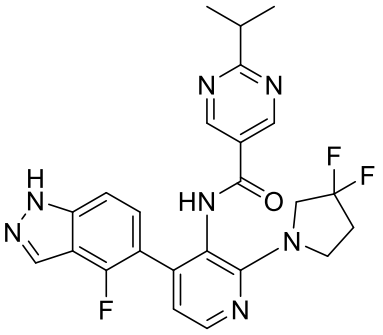
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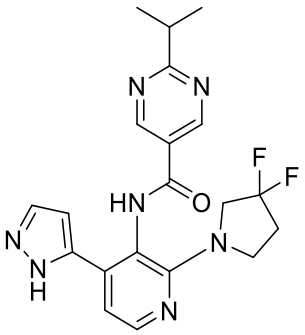
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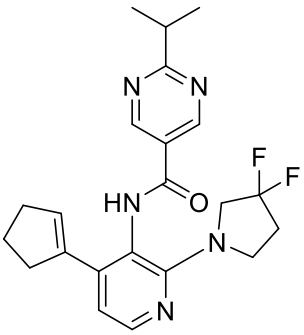
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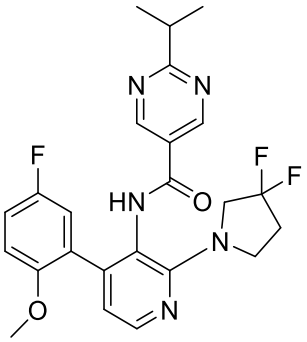
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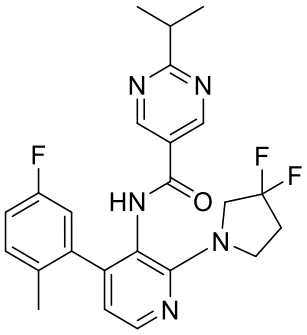
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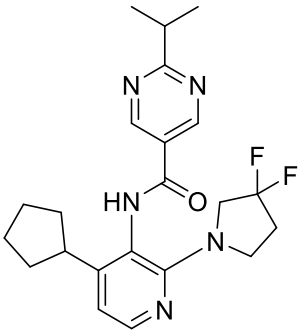
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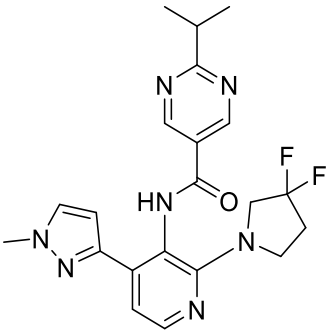
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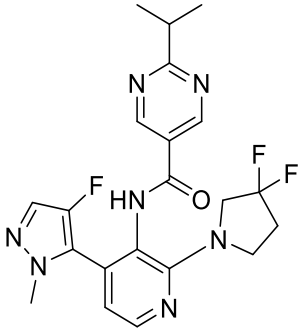
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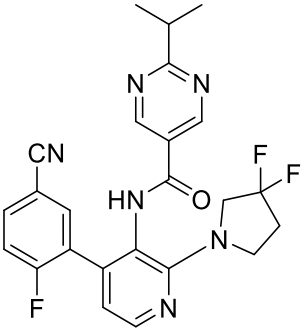
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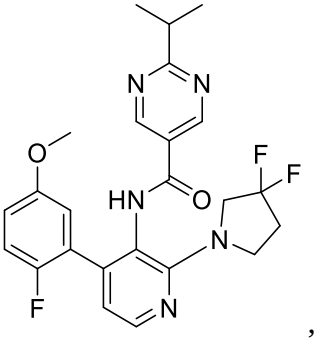
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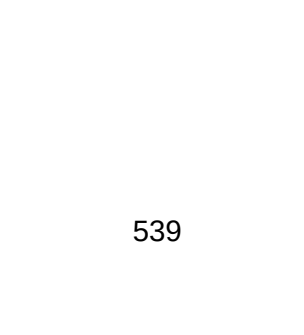
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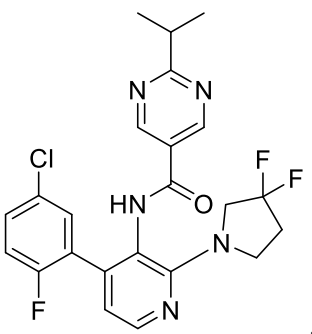
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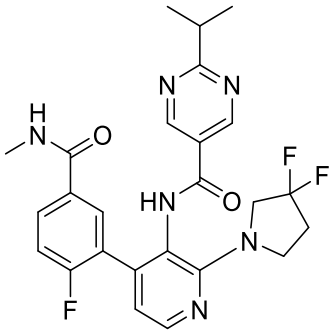
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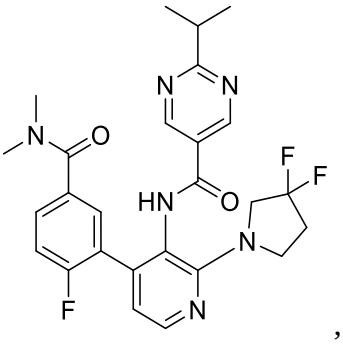
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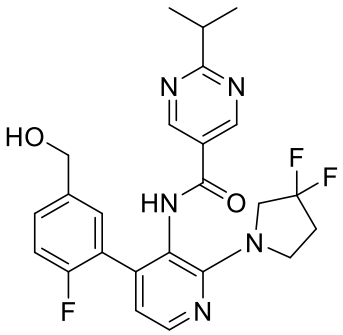
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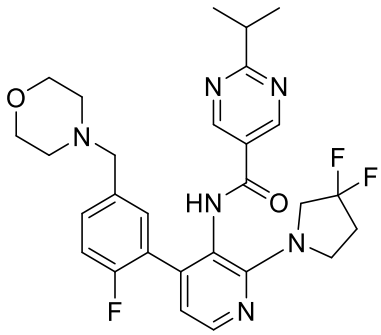
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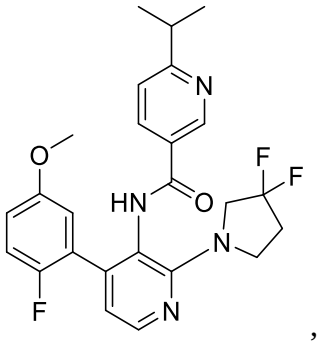
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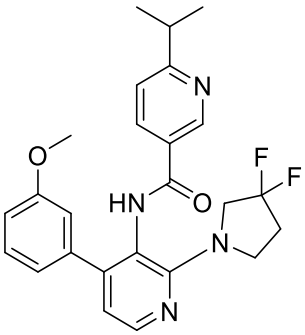
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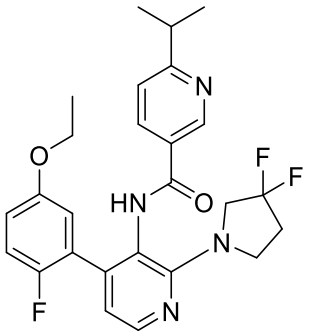
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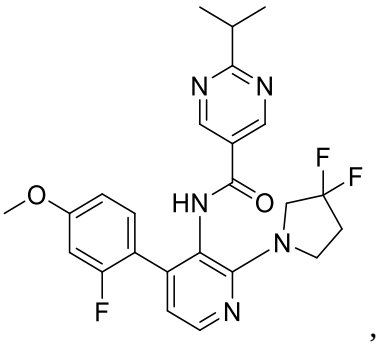
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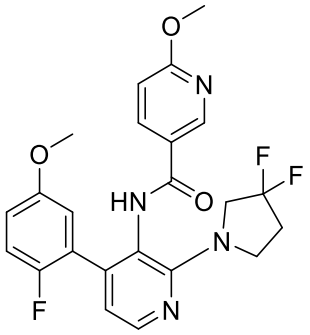
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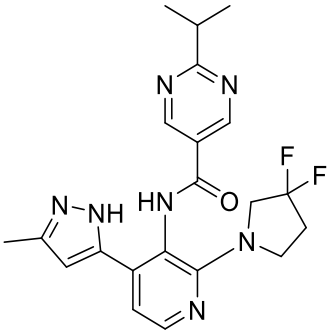
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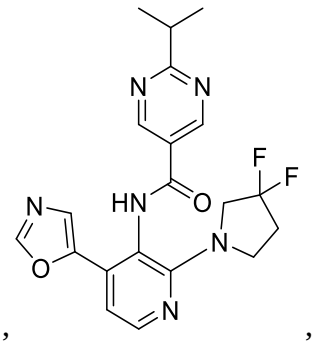
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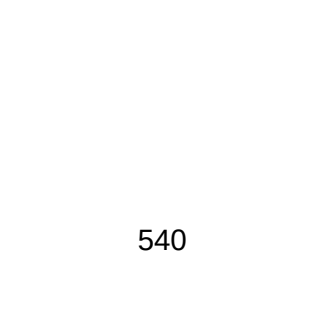
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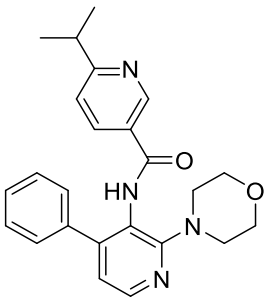
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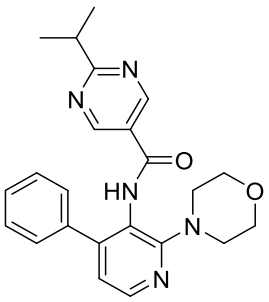
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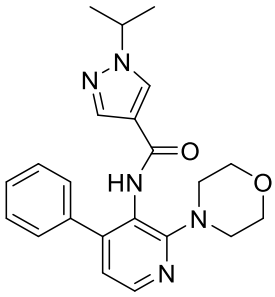
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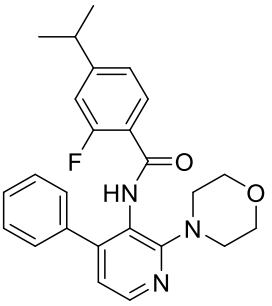
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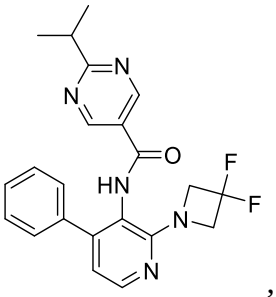
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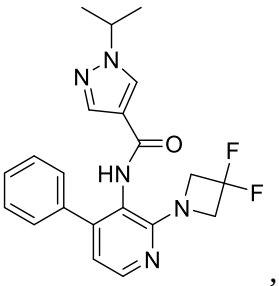
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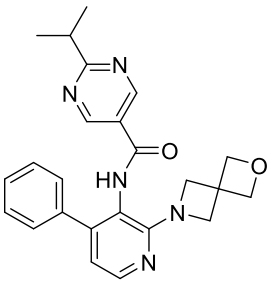
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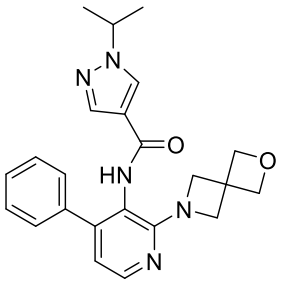
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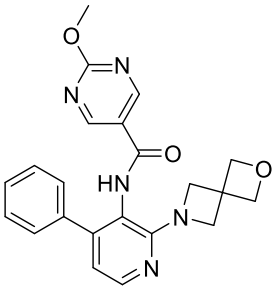
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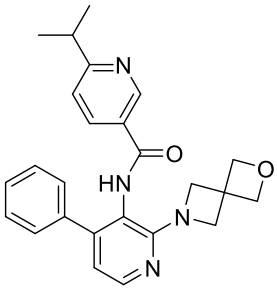
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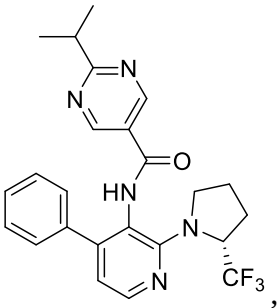
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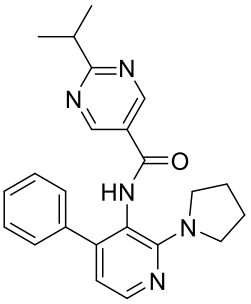
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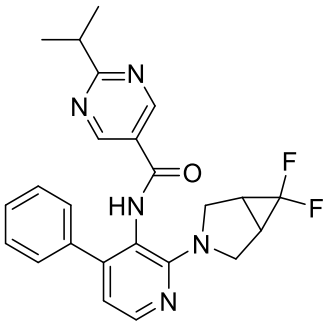
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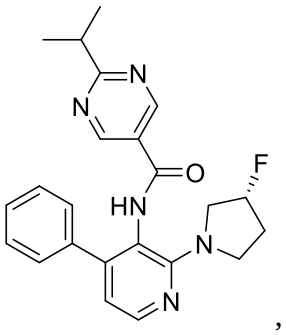
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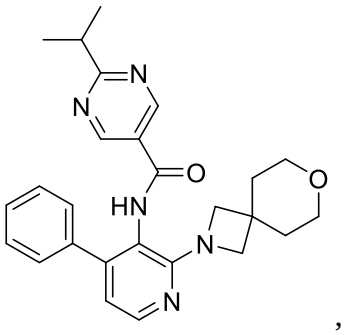
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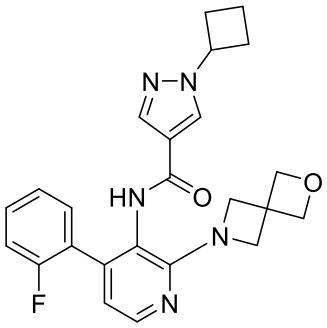
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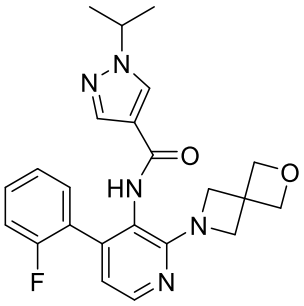
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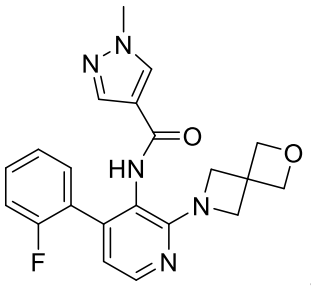
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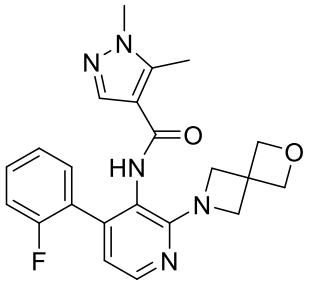
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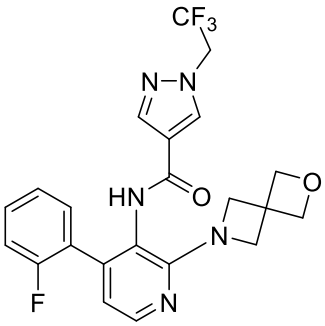
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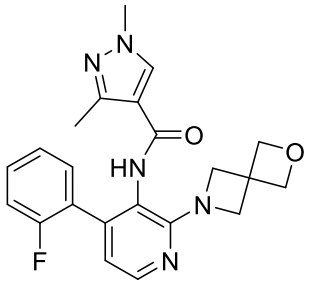
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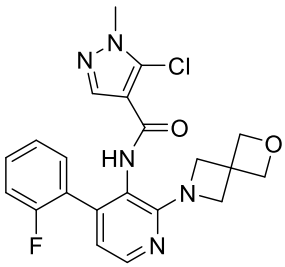
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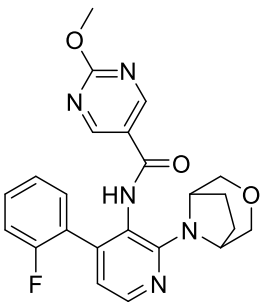
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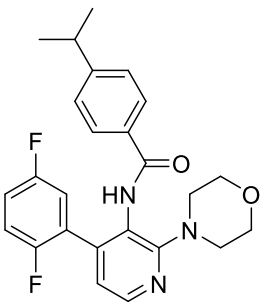
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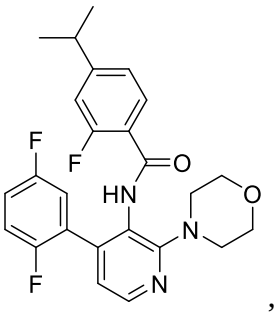
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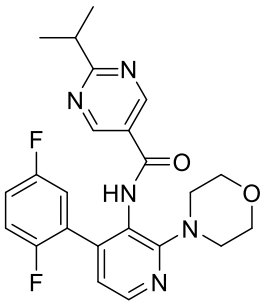
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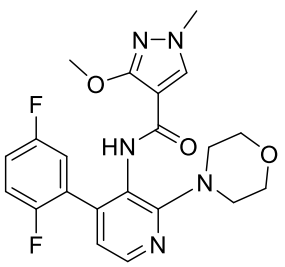
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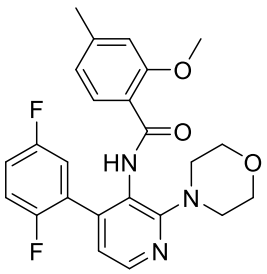
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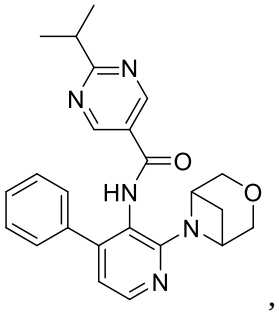
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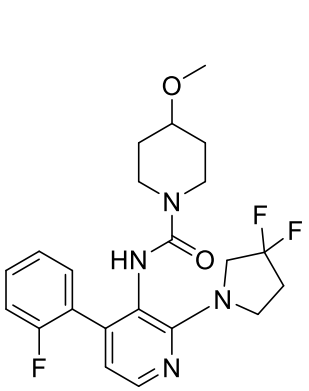
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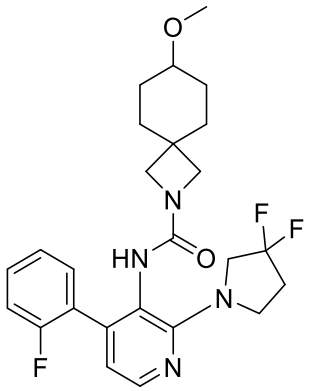
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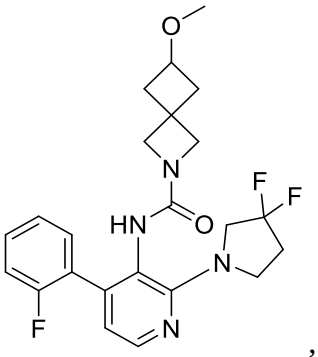
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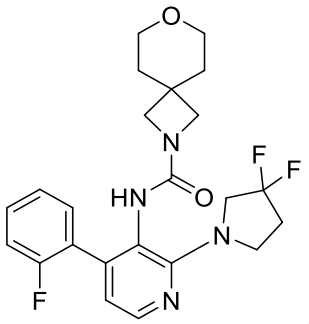
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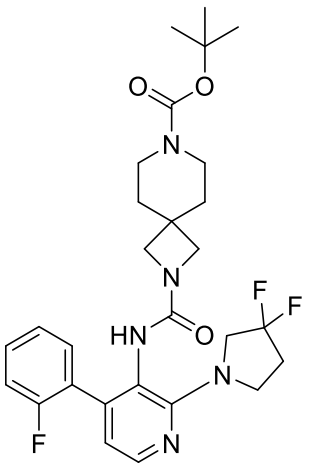
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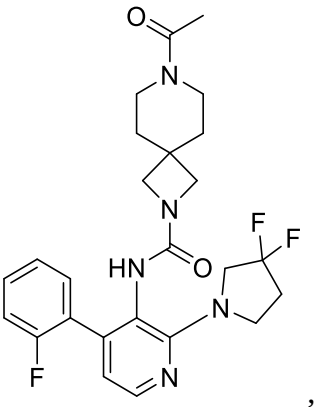
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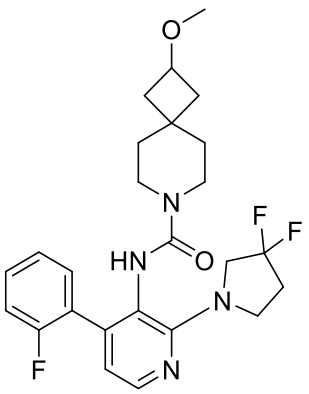
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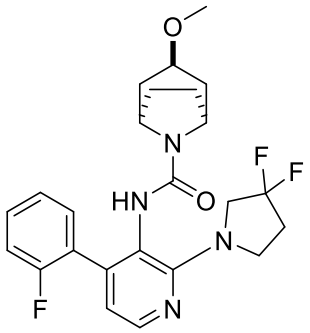
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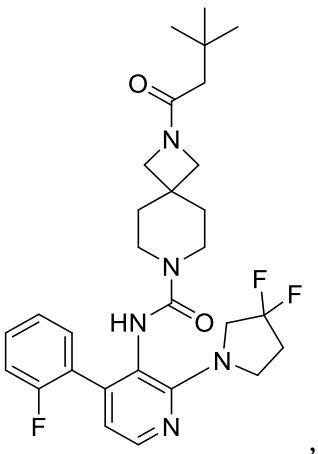
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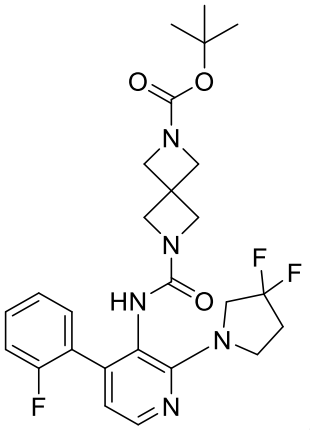
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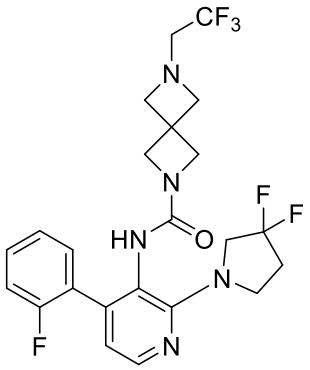
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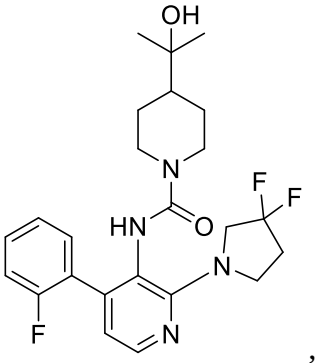
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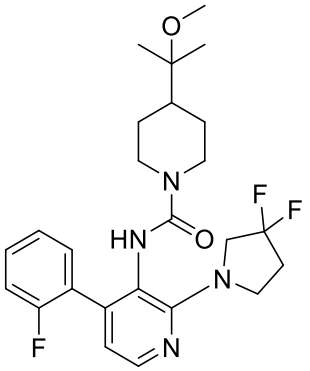
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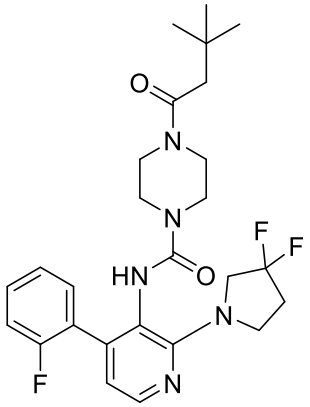
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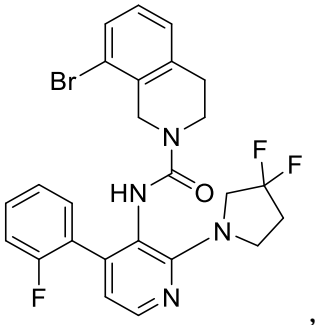
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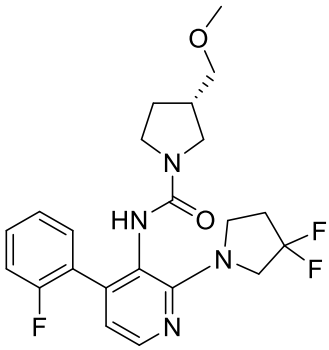
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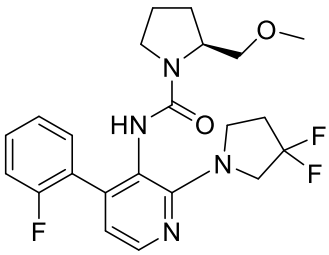
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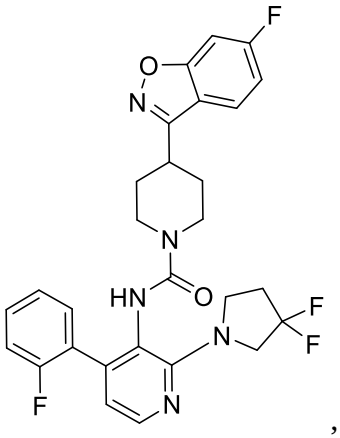
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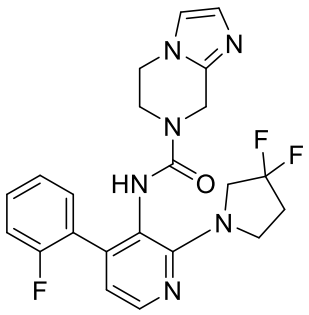
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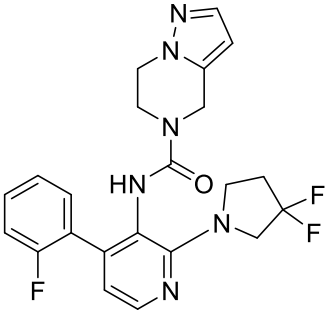
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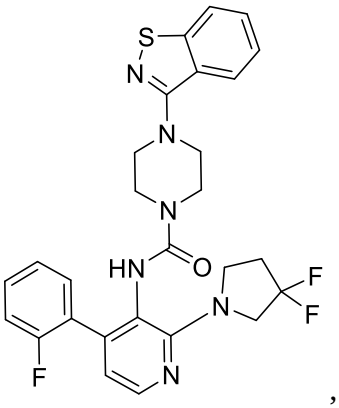
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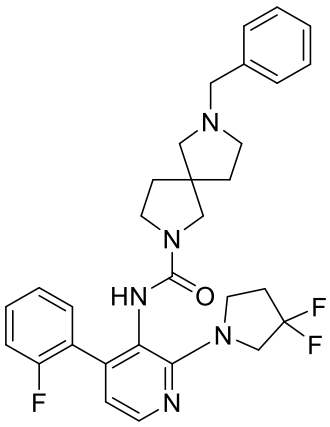
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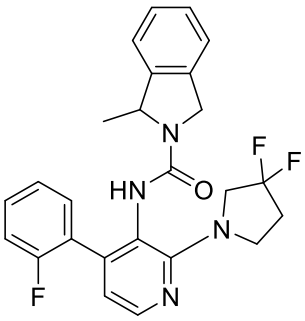
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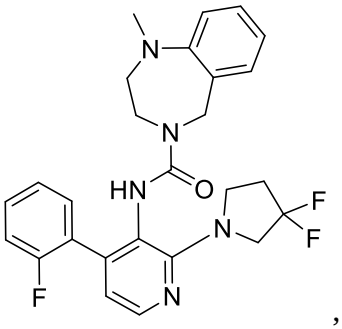
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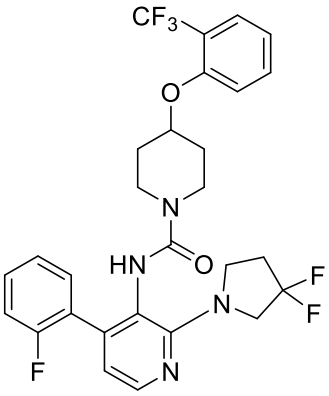
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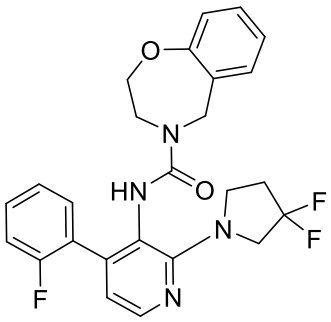
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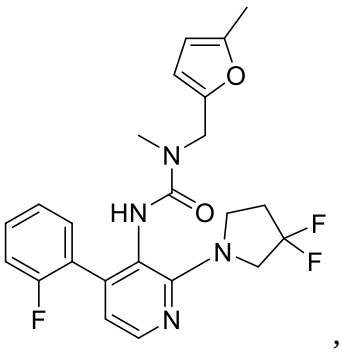
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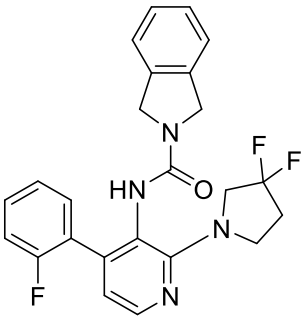
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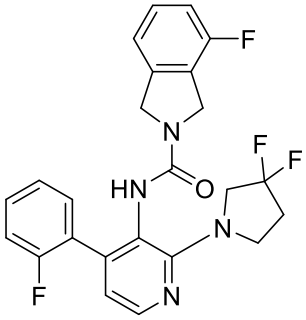
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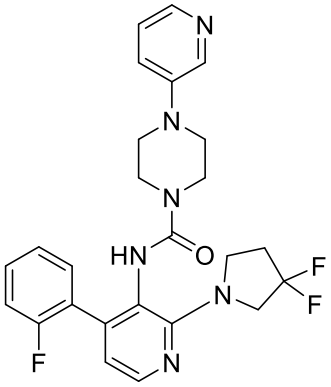
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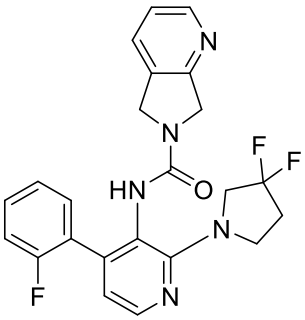
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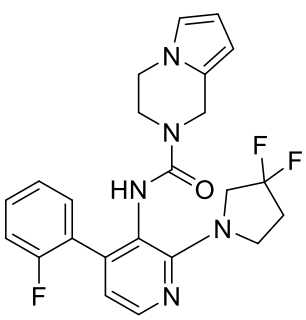
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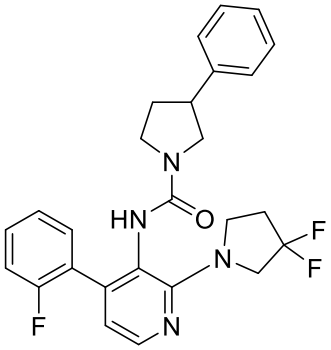
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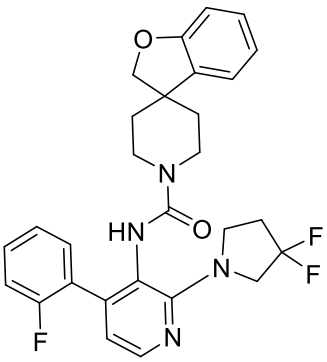
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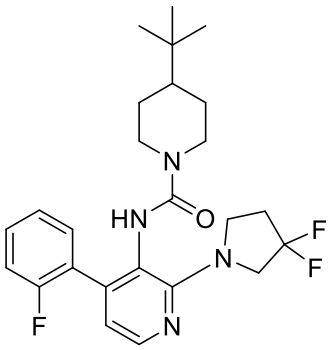
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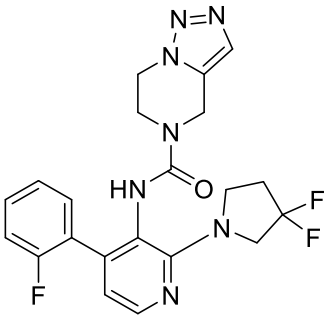
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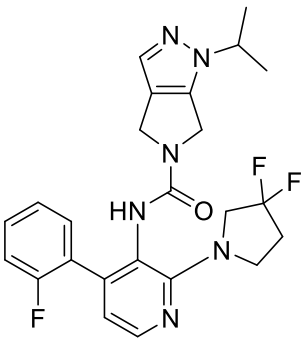
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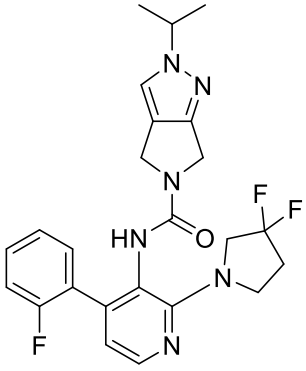
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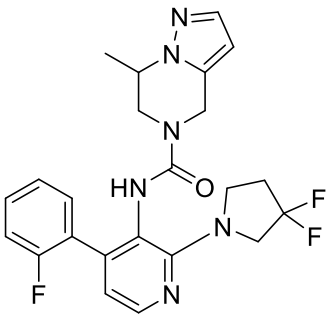
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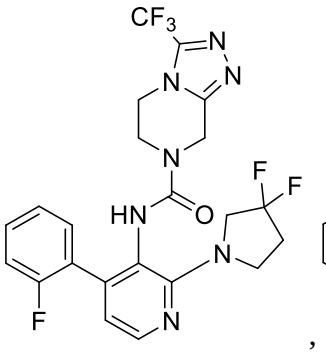
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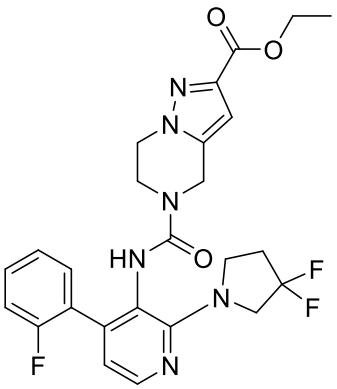
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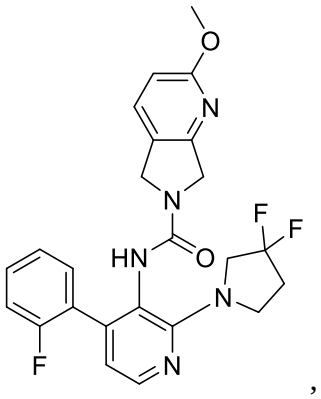
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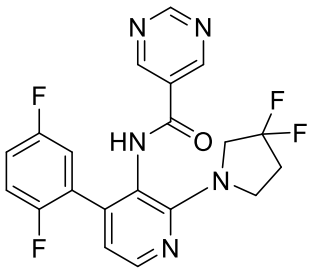
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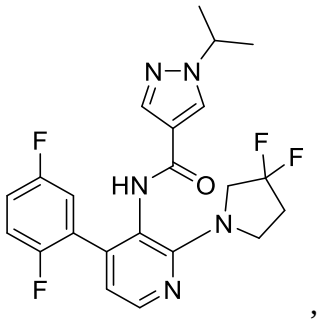
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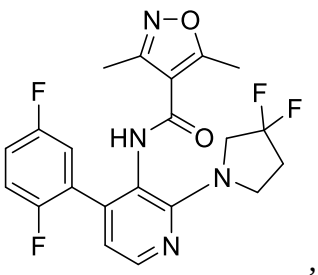
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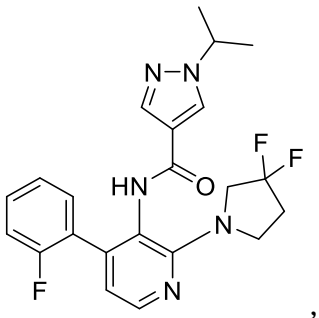
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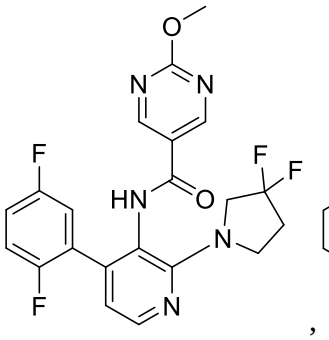
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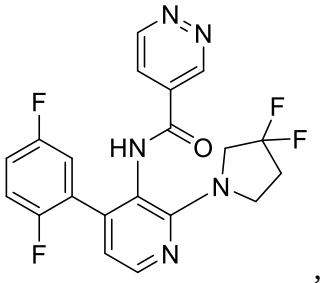
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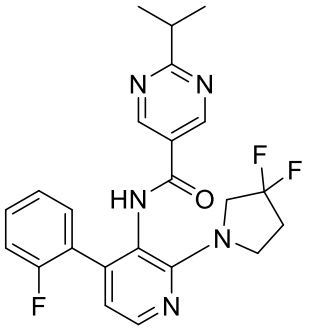
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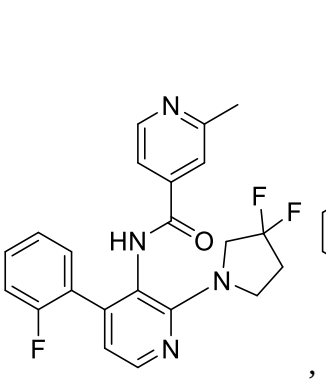
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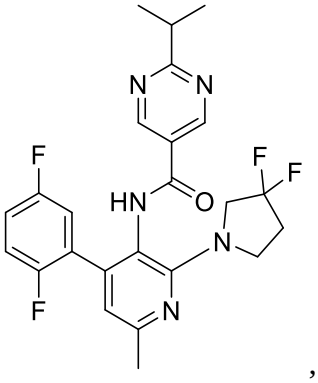
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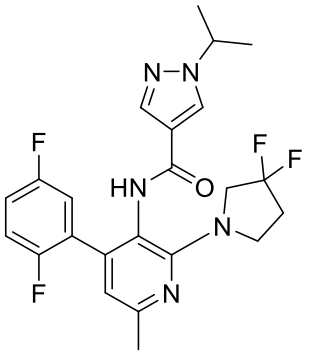
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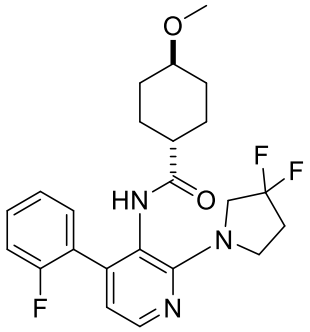
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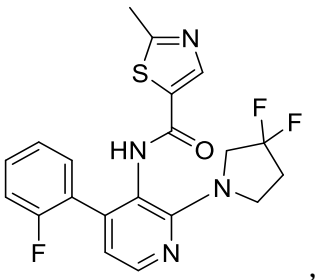
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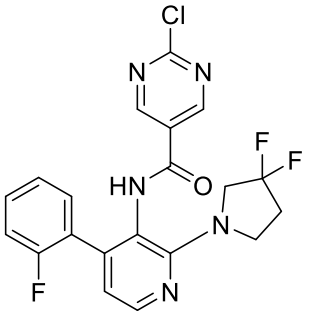
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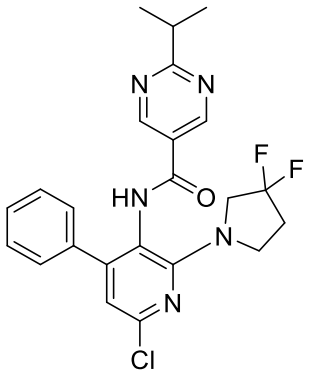
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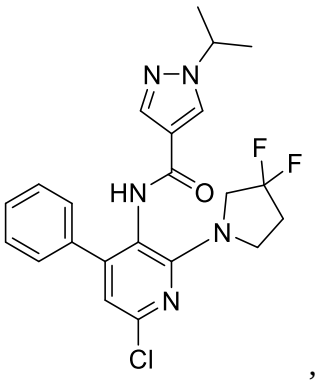
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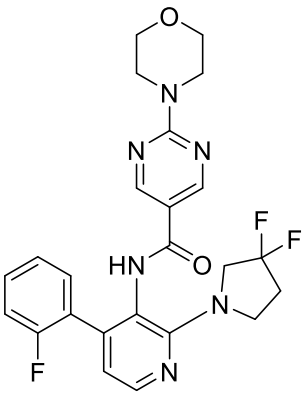
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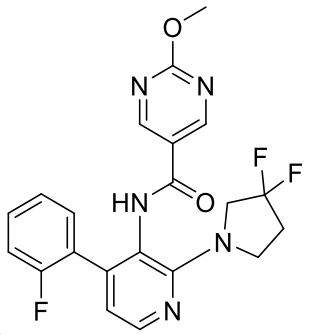
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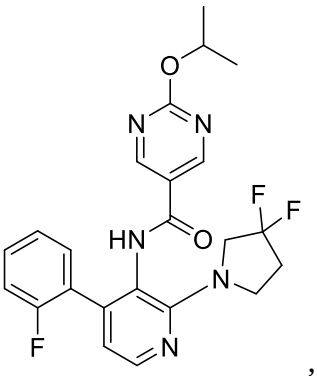
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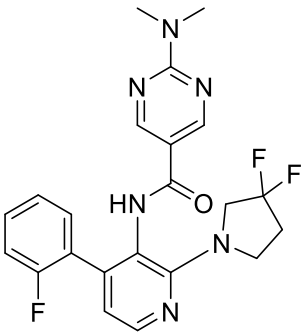
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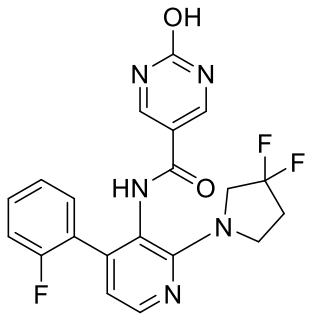
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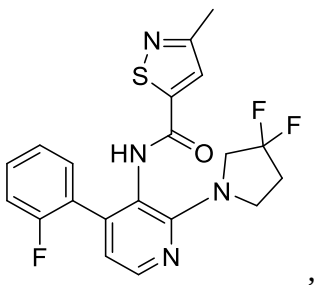
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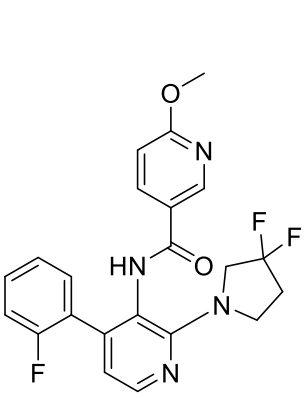
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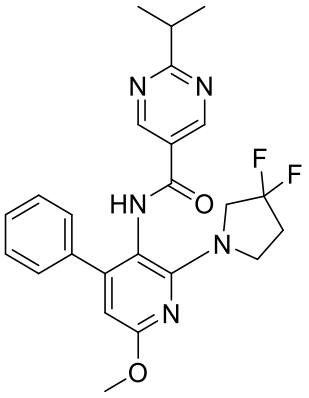
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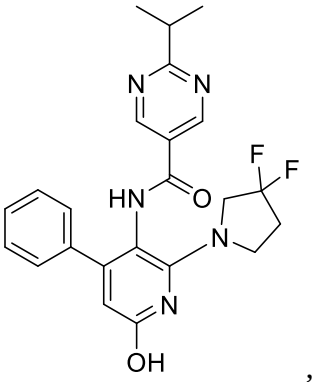
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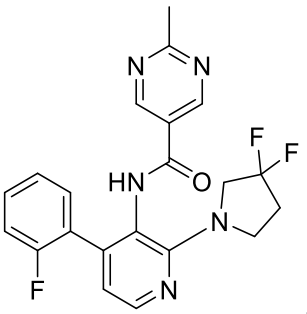
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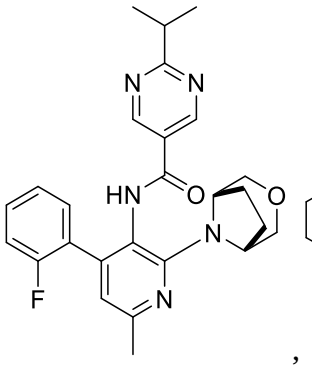
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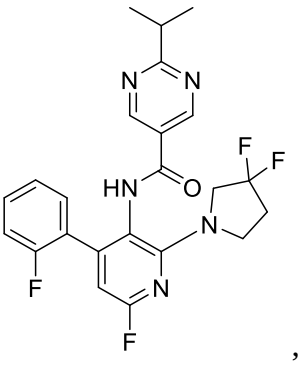
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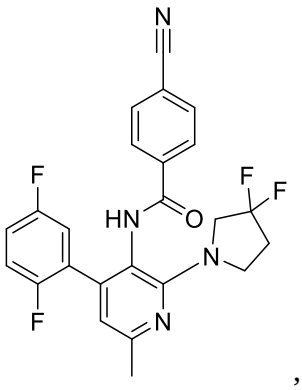
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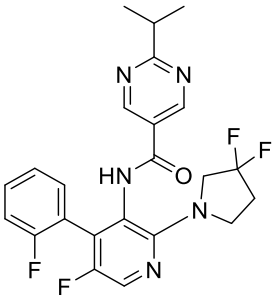
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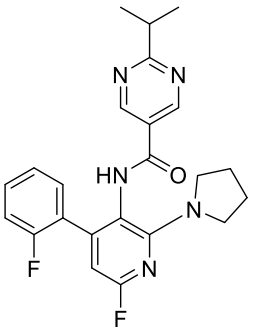
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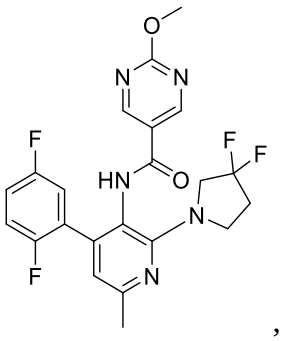
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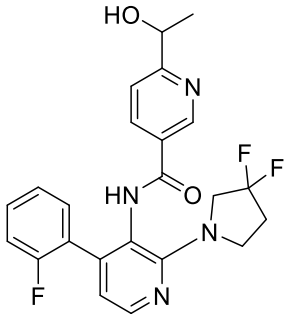
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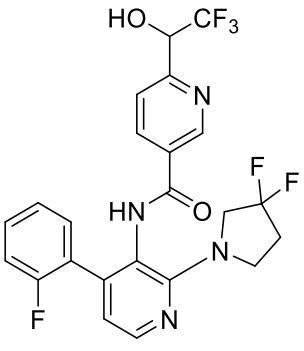
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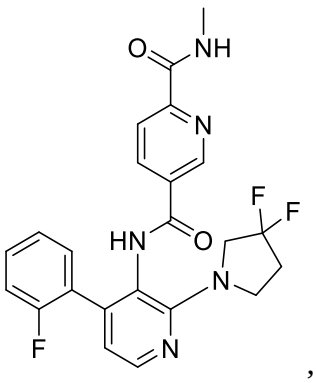
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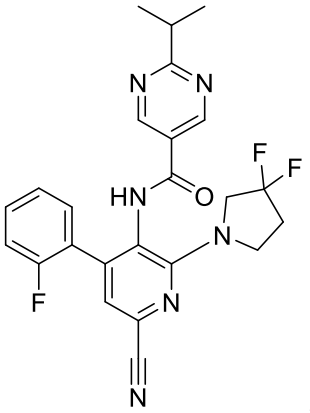
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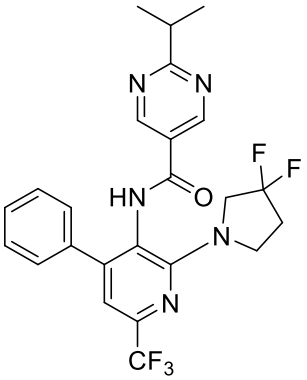
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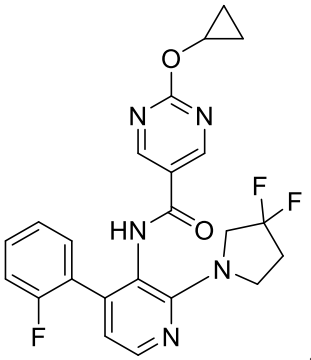
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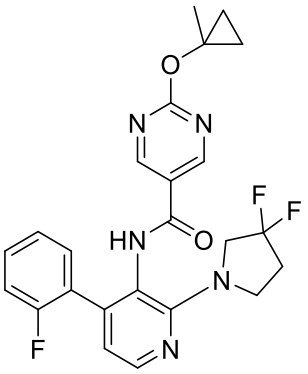
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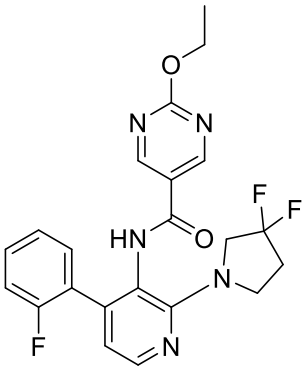
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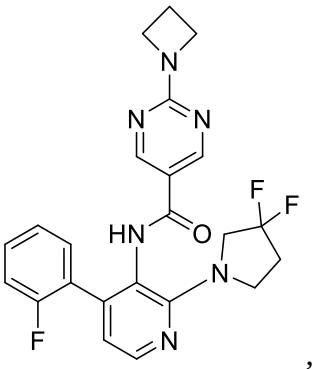
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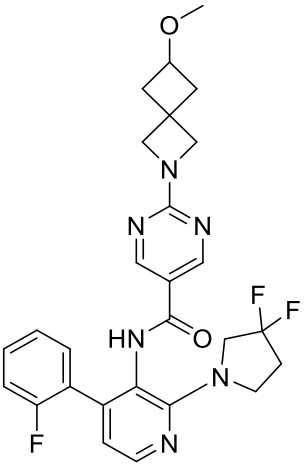
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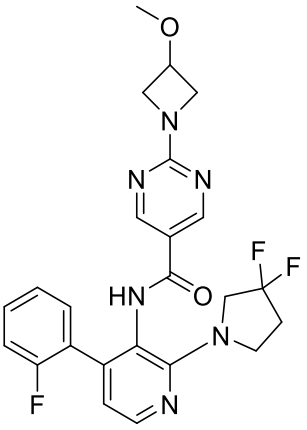
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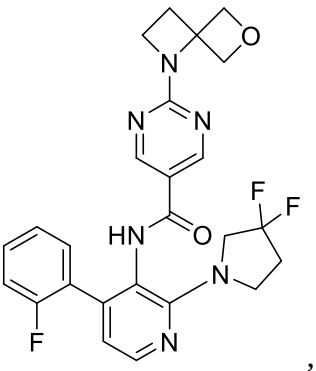
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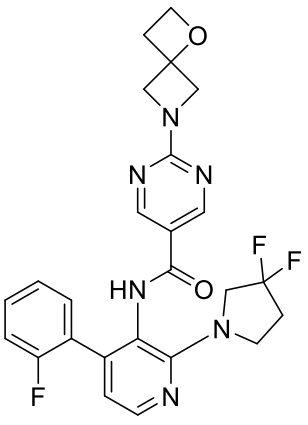
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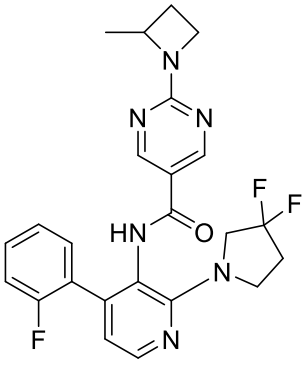
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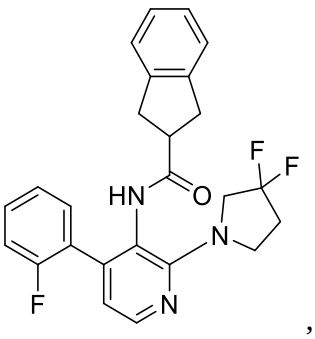
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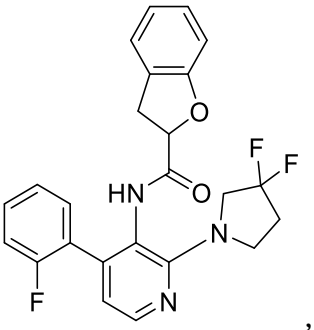
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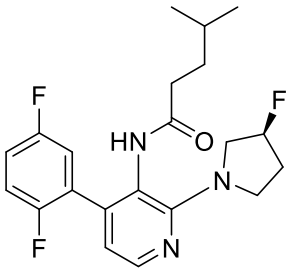
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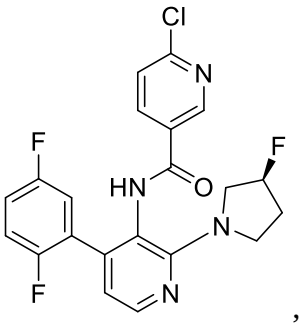
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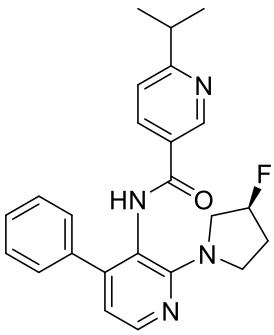
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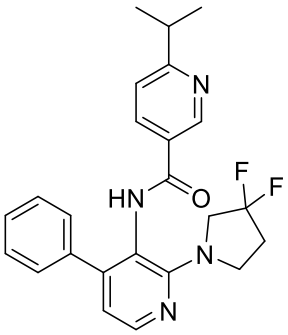
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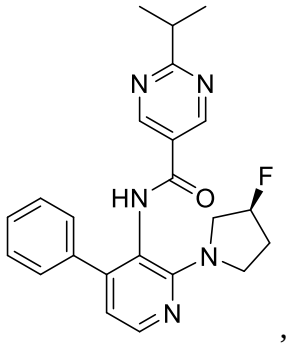
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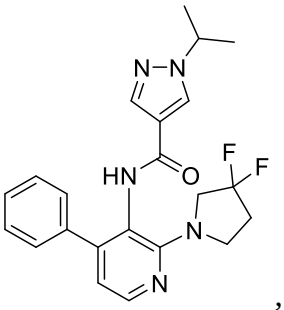
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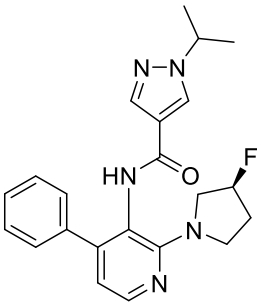
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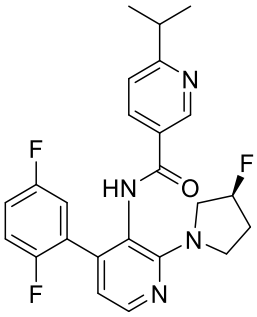
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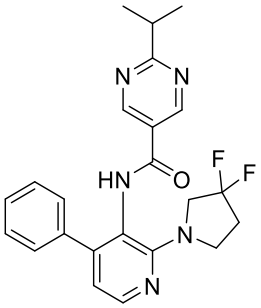
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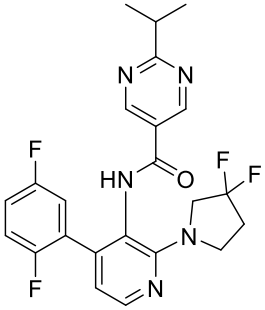
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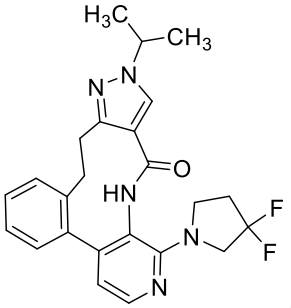
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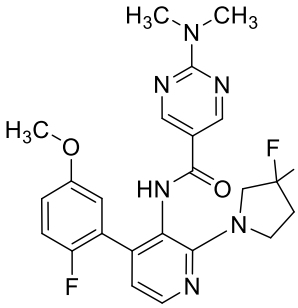
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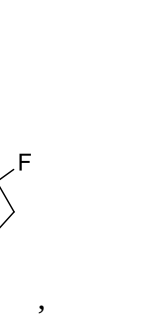
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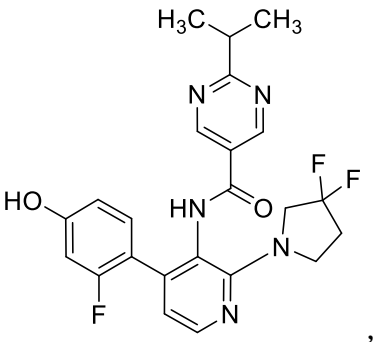
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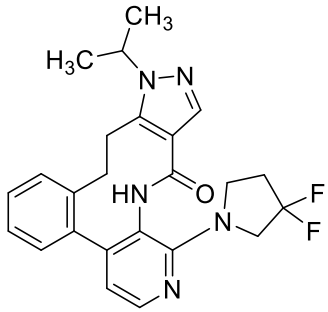
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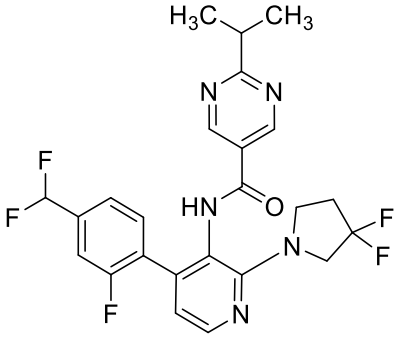
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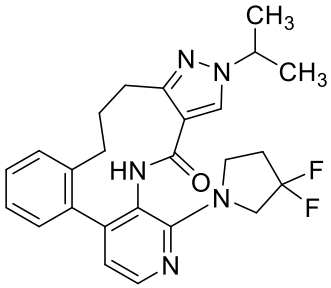
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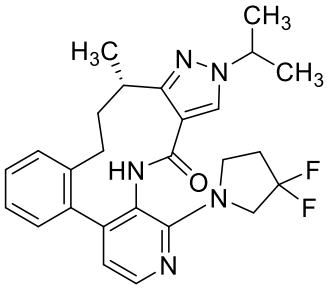
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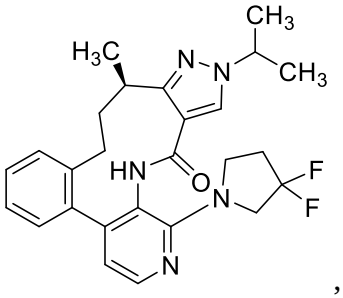
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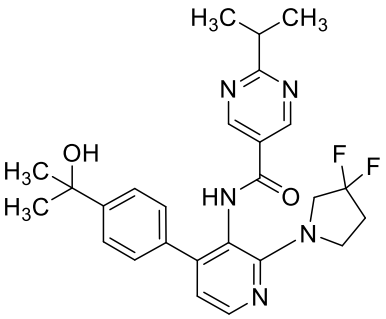
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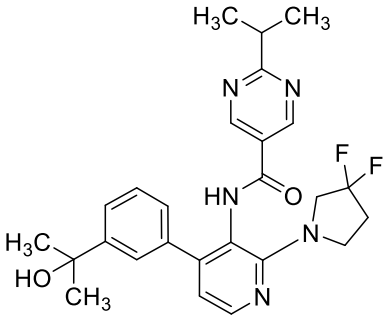
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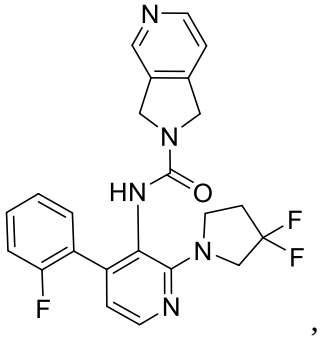
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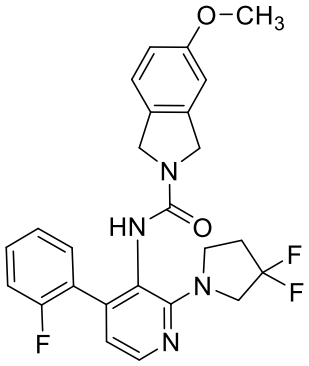
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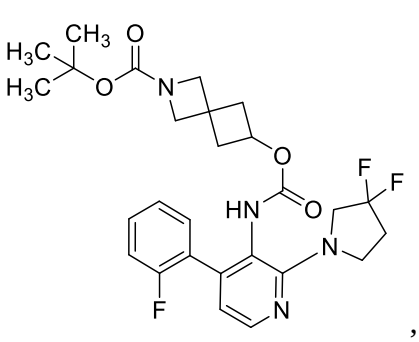
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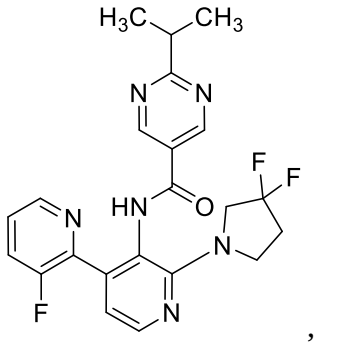
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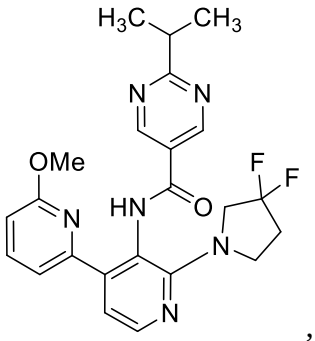
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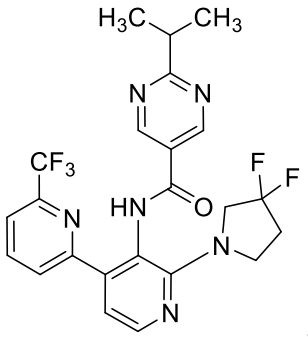
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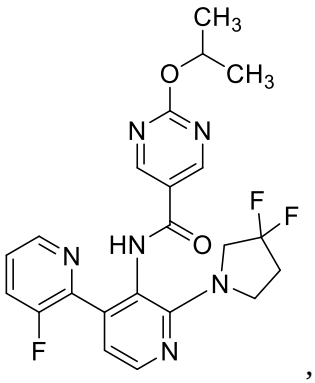
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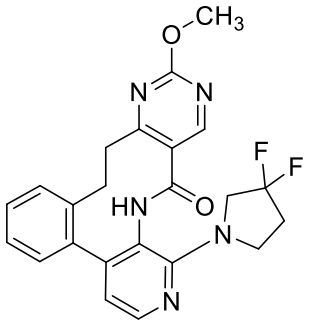
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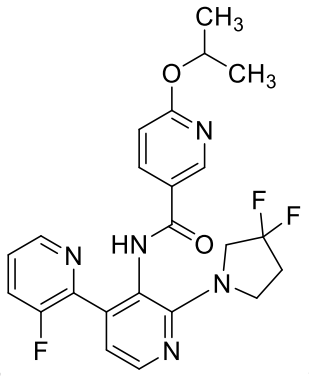
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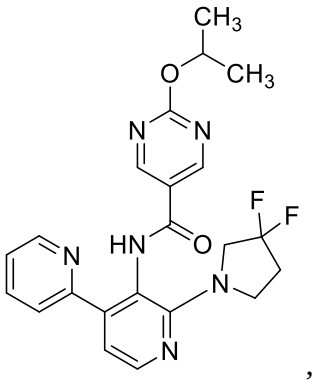
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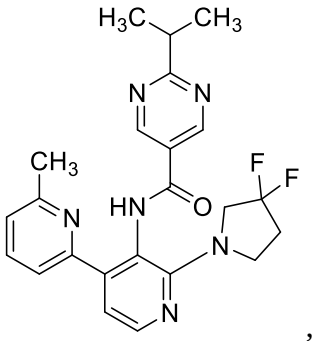
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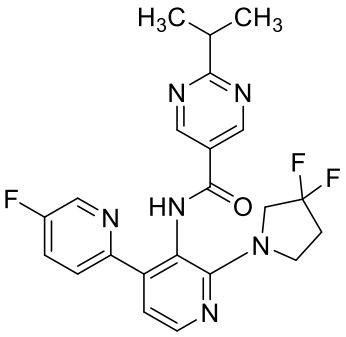
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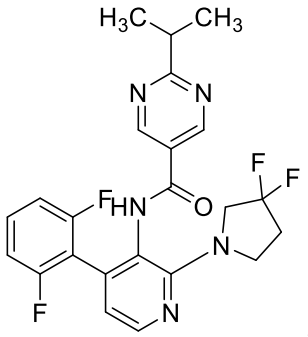
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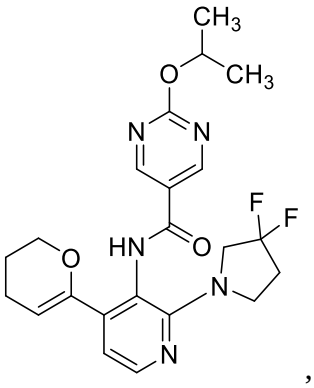
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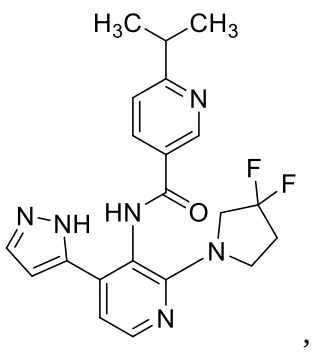
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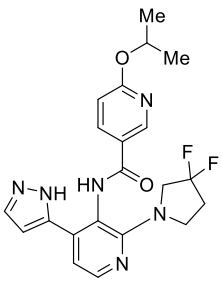
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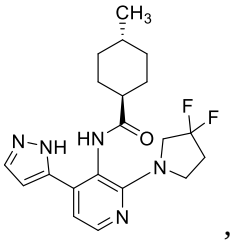
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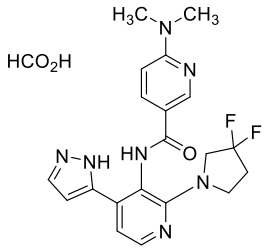
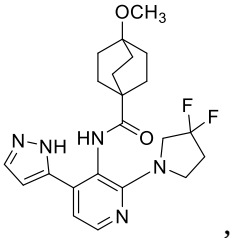
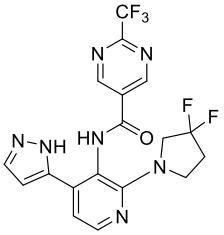
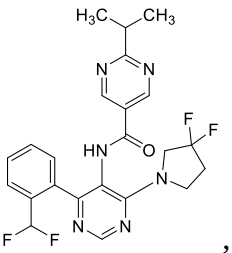
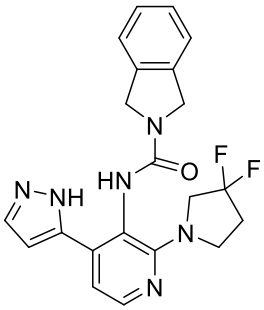
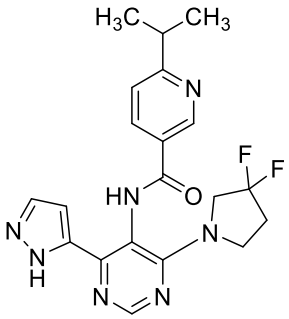
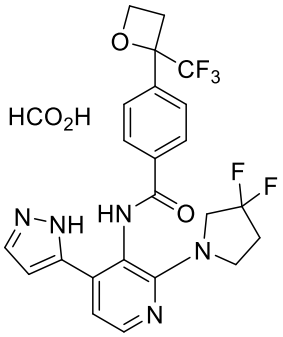
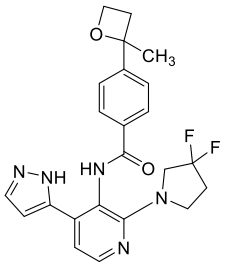
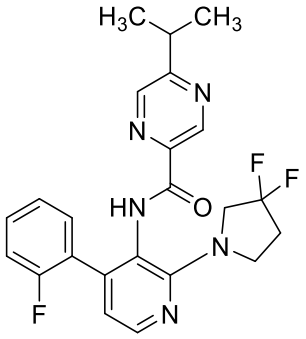
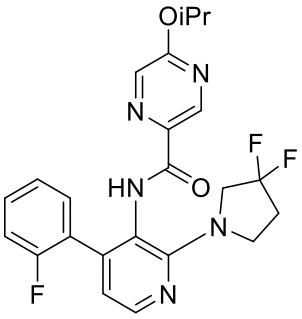
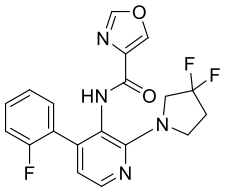
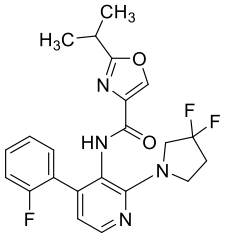
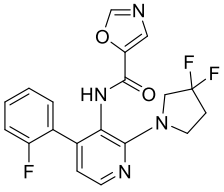
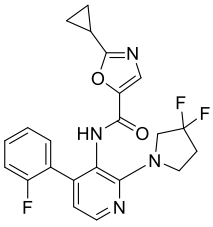
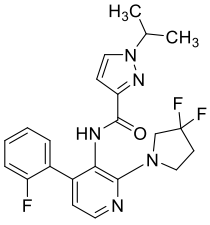
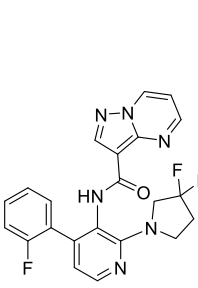
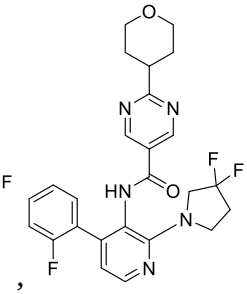

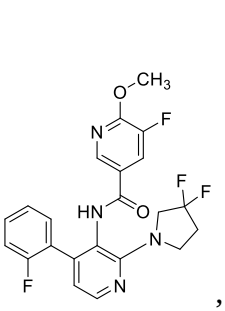
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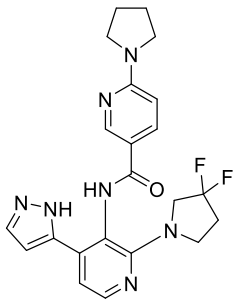
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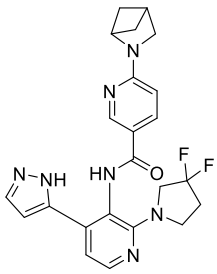
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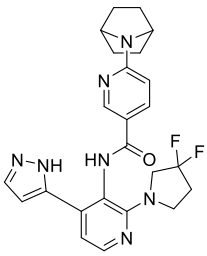
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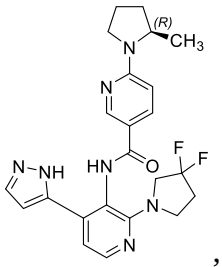
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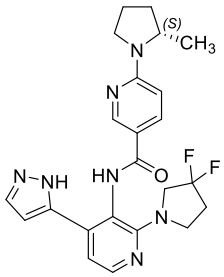
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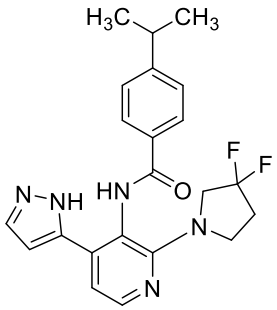
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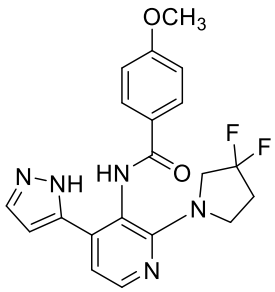
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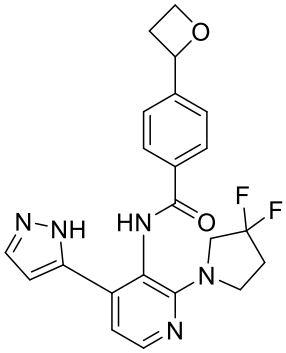
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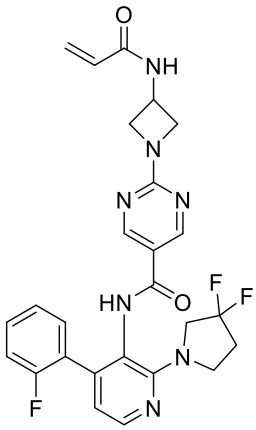
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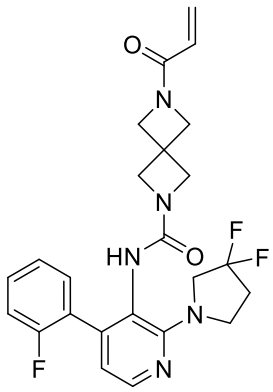
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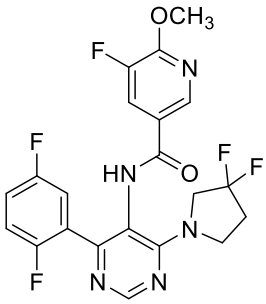
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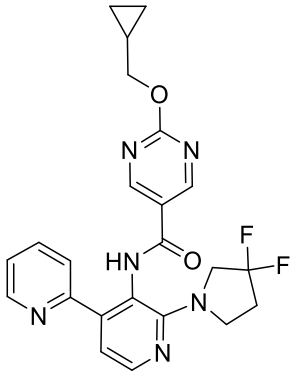
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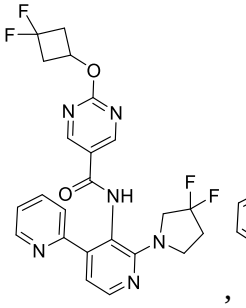
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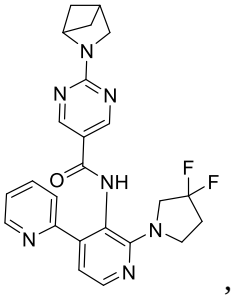
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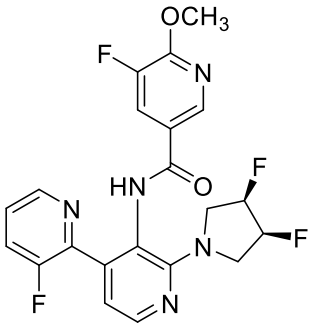
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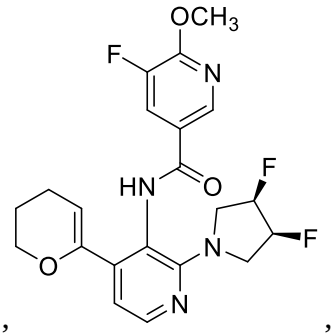
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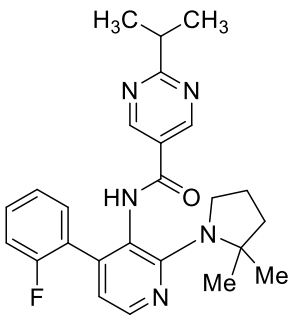
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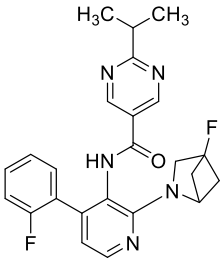
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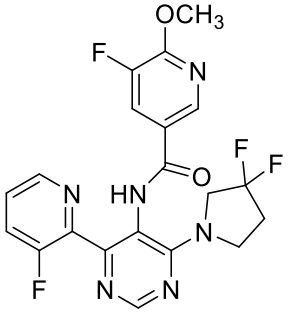
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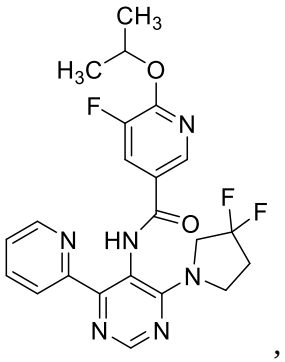
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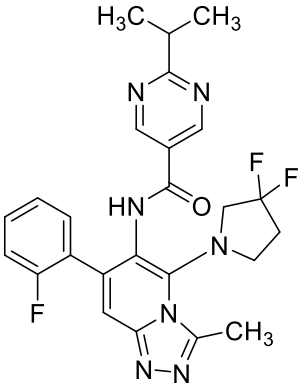
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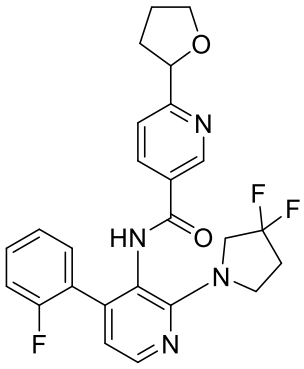
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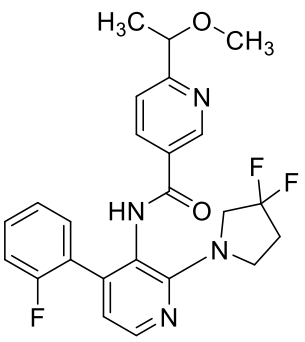
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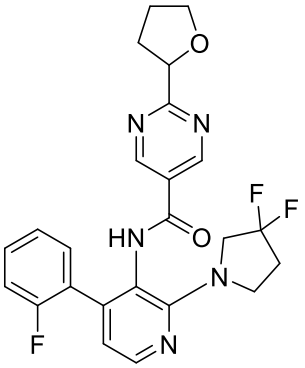
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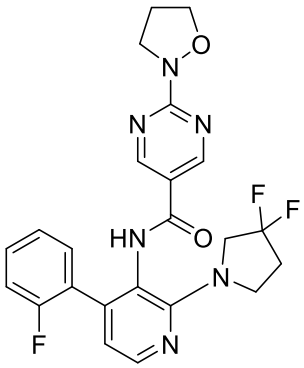
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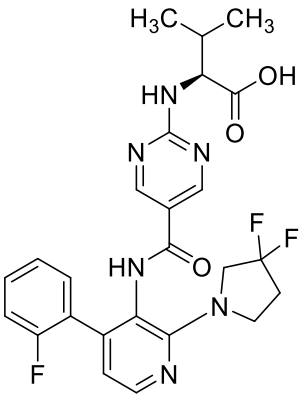
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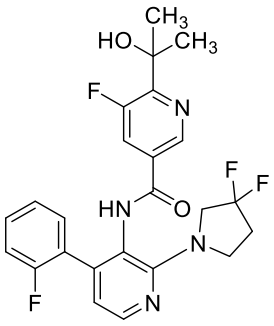
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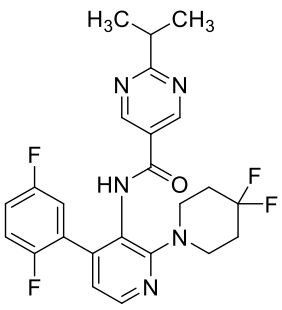
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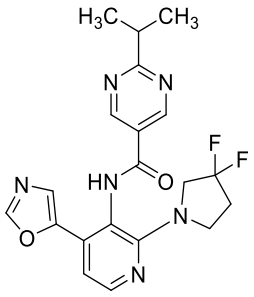
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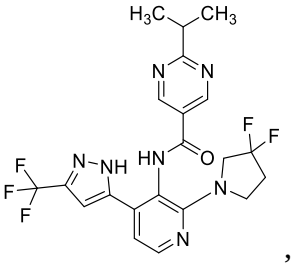
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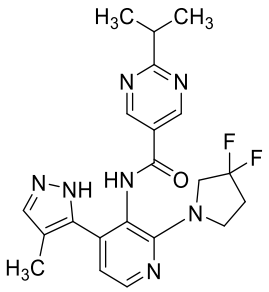
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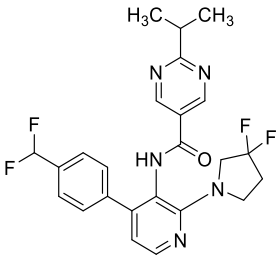
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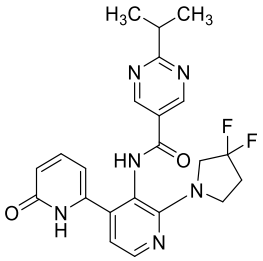
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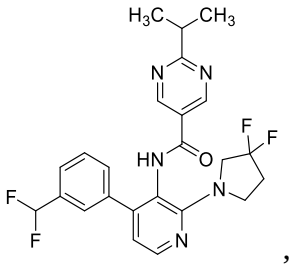
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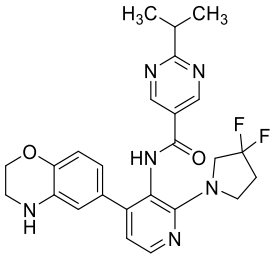
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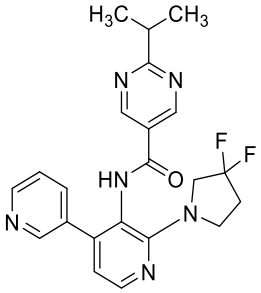
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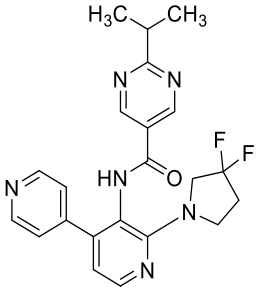
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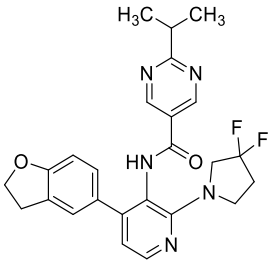
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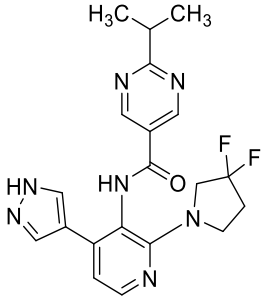
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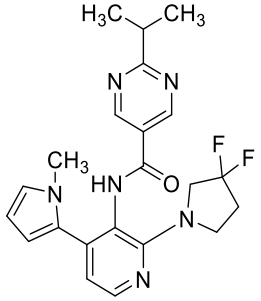
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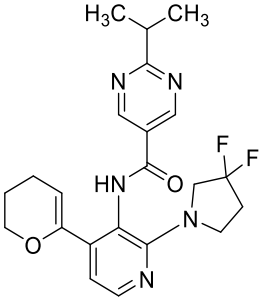
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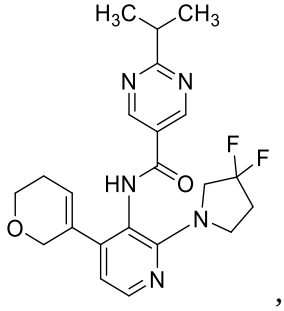
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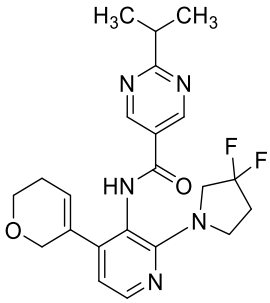
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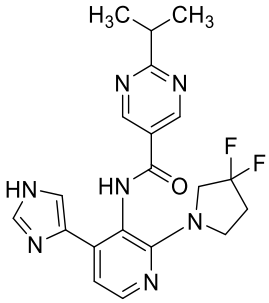
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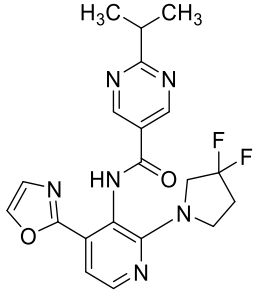
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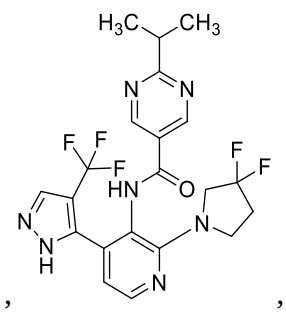
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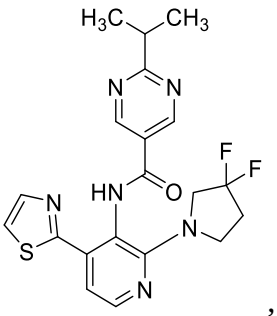
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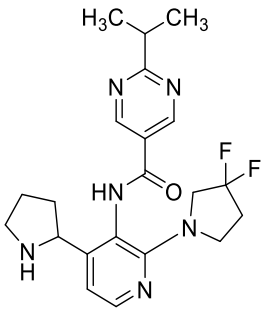
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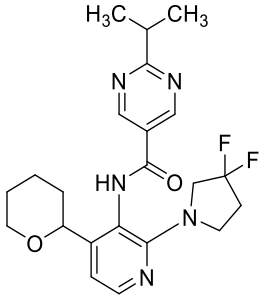
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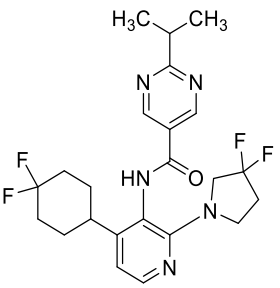
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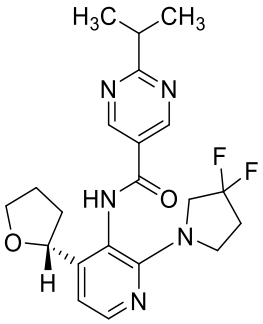
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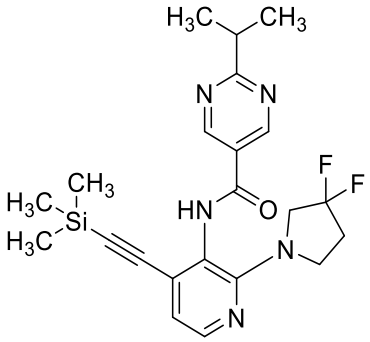
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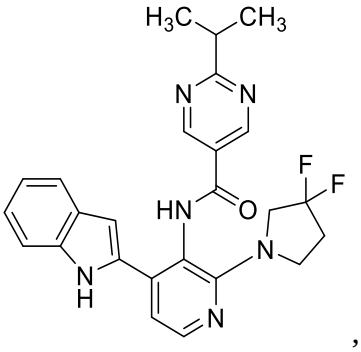
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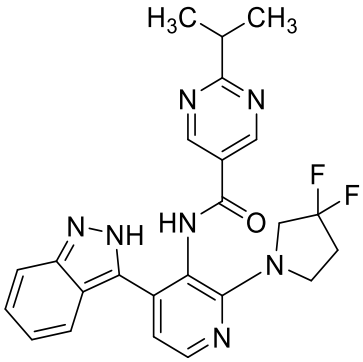
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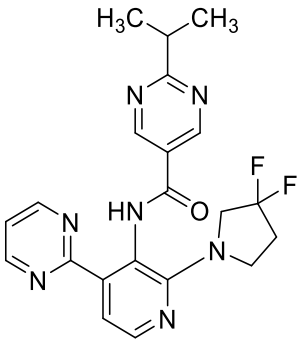
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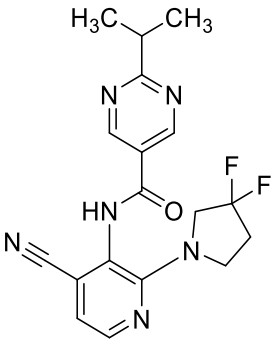
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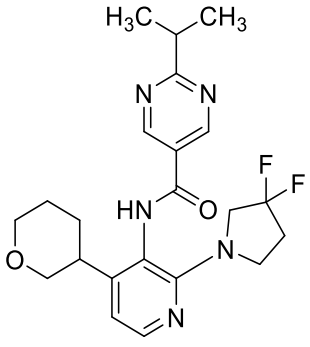
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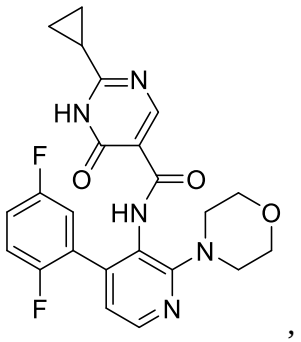
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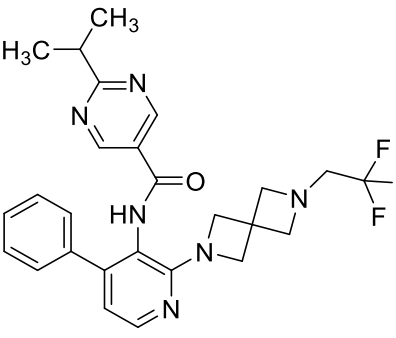
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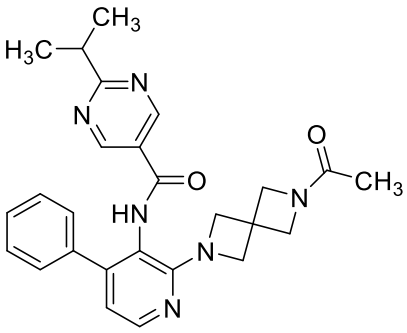
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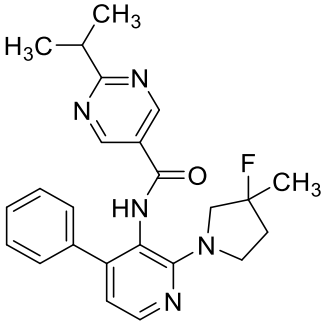
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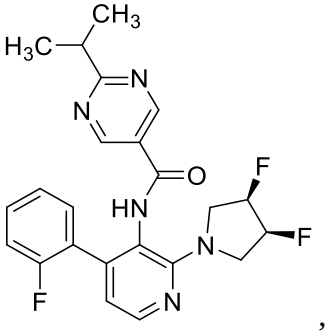
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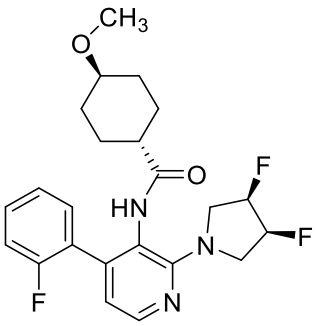
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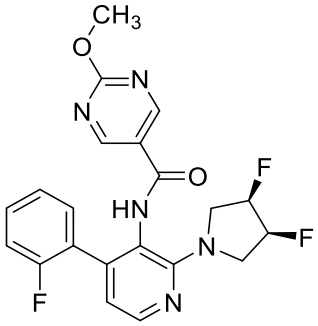
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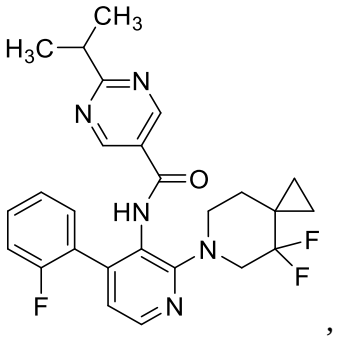
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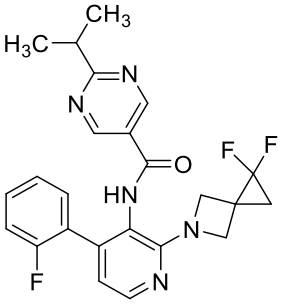
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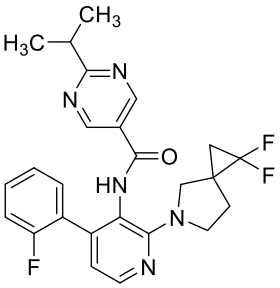
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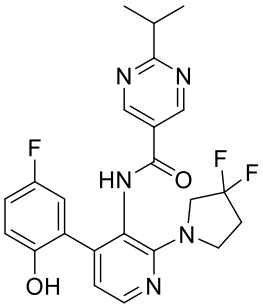
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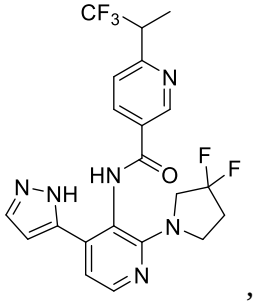
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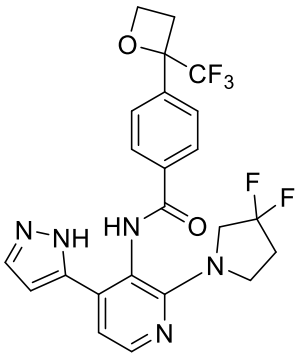
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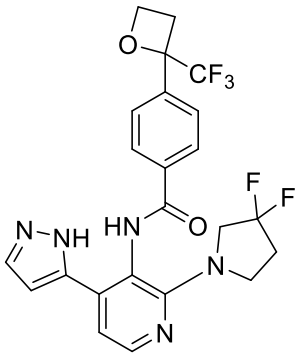
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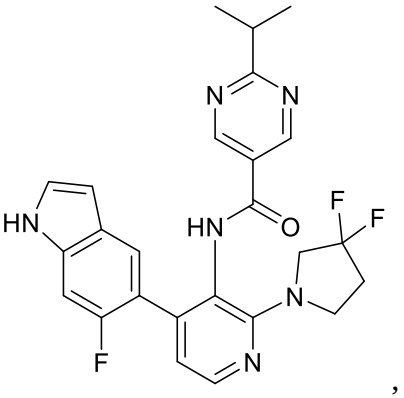
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or a pharmaceutically acceptable salt, or solvate thereof.

16. A pharmaceutical composition comprising a pharmaceutically acceptable excipient and a compound of any one of claims 1-15 or a pharmaceutically acceptable salt, or solvate thereof.

17. The compound of any one of claims 1-15, or a pharmaceutically acceptable salt or solvate thereof, for use in the treatment of a disease or condition in a mammal modulated by a voltage-gated sodium channel.

18. The compound of any one of claims 1-15, or a pharmaceutically acceptable salt or solvate thereof, for use in the treatment of a disease or condition in a mammal, wherein the disease or condition is selected from epilepsy, seizure disorders, partial seizures, generalized seizures, photosensitive epilepsy, self-induced syncope, intractable epilepsy, Angelman syndrome, benign rolandic epilepsy, CDKL5 disorder, childhood and juvenile absence epilepsy, Dravet syndrome, frontal lobe epilepsy, Glut1 deficiency syndrome, hypothalamic hamartoma, infantile spasms/West's syndrome, juvenile myoclonic epilepsy, Landau-Kleffner syndrome, Lennox-Gastaut syndrome (LGS), epilepsy with myoclonic-absences, Ohtahara syndrome, Panayiotopoulos syndrome, PCDH19 epilepsy, progressive myoclonic epilepsies, Rasmussen's syndrome, ring chromosome 20 syndrome, reflex epilepsies, temporal lobe epilepsy, Lafora progressive myoclonus epilepsy, neurocutaneous syndromes, tuberous sclerosis complex, early infantile epileptic encephalopathy, early onset epileptic encephalopathy, generalized epilepsy with febrile seizures plus (GEFS+), Rett syndrome, multiple sclerosis, Schizophrenia, autism, ataxia, hypotonia and paroxysmal dyskinesia, Alzheimer's disease, Tauopathies, Pick's disease, progressive supranuclear palsy, corticobasal syndrome, frontotemporal dementias, Argyrophilic grain disease, frontotemporal lobar degeneration, globular glial tauopathies, MAPT mutation, primary age-related tauopathy, neurofibrillary tangle dementia, chronic traumatic encephalopathy (CTE), aging-related tau astrogliopathy, Richardson syndrome, Down Syndrome, parkinsonism, pure akinesia with gait freezing, motor neuron symptoms or cerebellar ataxia, posttraumatic stress

disorders (PTSD), and any combination thereof.