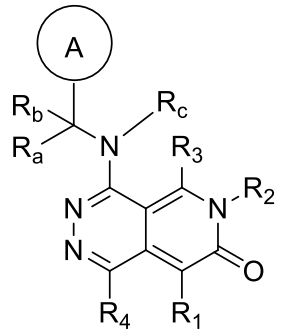
CLAIMS

1. A compound represented by Formula I, or a tautomer, stereoisomer, solvate, metabolite, isotopically labeled compound, pharmaceutically acceptable salt or co-crystal thereof:



Formula I

wherein:

ring A is selected from aryl, heteroaryl, the aryl, heteroaryl are optionally substituted with a substituent selected from halogen, alkyl, alkoxy, -OH, -CN, -NR_5R_6, -SF_5, -SO_2R_{10}, the alkyl, alkoxy are further optionally substituted with a substituent selected from halogen, -NR_5R_6, -OH, wherein, R_5, R_6 are independently selected from H, alkyl, R_{10} is alkyl and optionally substituted with halogen; or, two substituents on the aryl or heteroaryl are connected to form an aliphatic carbocyclic ring, the aliphatic carbocyclic ring is optionally substituted with halogen;

R_a, R_b, R_c are independently selected from H, alkyl;

R_1, R_3 are independently selected from H, halogen, alkyl, alkoxy, -OH, -CN, -NR_7R_8, the alkyl, alkoxy are optionally substituted with a substituent selected from halogen, -NR_7R_8, wherein R_7, R_8 are independently selected from H, alkyl;

R_2 is selected from H, alkyl, cycloalkyl, heterocycloalkyl, cycloalkenyl, heterocycloalkenyl, the cycloalkyl, heterocycloalkyl, cycloalkenyl, heterocycloalkenyl are optionally substituted with a substituent selected from halogen, alkyl, alkoxy, , -C(=O)R_9, R_9 is selected from alkyl, cycloalkyl, heterocycloalkyl;

R_4 is -$NR_{11}R_{12}$, R_{11}, R_{12} are independently selected from H, alkyl, cycloalkyl, heterocycloalkyl, wherein, when R_{11} and/or R_{12} are alkyl, the alkyl is optionally substituted with a substituent selected from -OH, alkenyl, halogen, -$NR_{14}R_{15}$, cycloalkyl, R_{14}, R_{15} are independently selected from H, alkyl; when R_{11} and/or R_{12} are selected from cycloalkyl, heterocycloalkyl, the cycloalkyl, heterocycloalkyl are optionally substituted with alkyl; or,

R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a heterocycloalkyl, the heterocycloalkyl is optionally substituted with a substituent selected from halogen, alkyl, cycloalkyl, -C(=O)R_{13}, , -OH, the alkyl is further optionally substituted with a substituent selected from -OH, cycloalkyl, wherein, R_{13} is alkyl; or,

R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a heteroaryl.

2. The compound according to claim 1, wherein R_4 is -$NR_{11}R_{12}$, R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a 3-10 membered heterocycloalkyl, the heterocycloalkyl contains heteroatoms selected from N, O, S, the heterocycloalkyl is optionally substituted with a substituent selected from

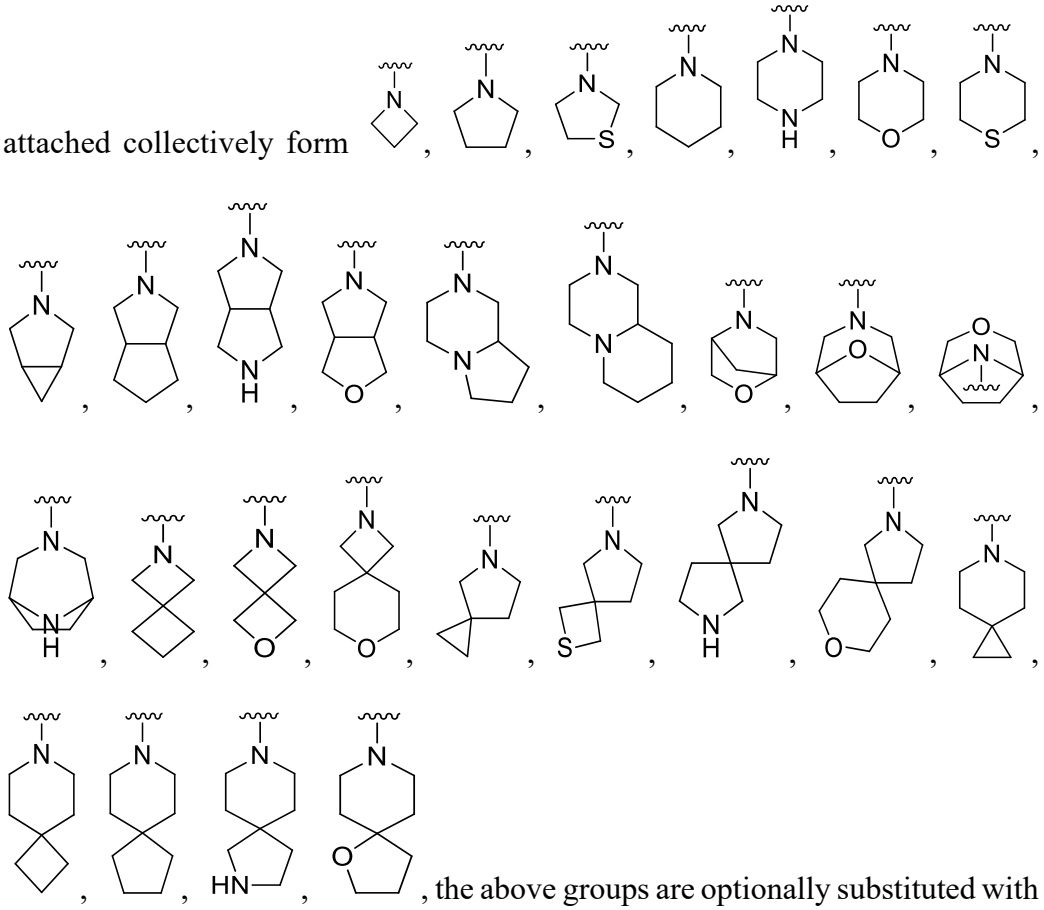
halogen, C1-C6 alkyl, 3-10 membered cycloalkyl, -C(=O)R_{13}, , -OH, the alkyl is further optionally substituted with a substituent selected from -OH, 3-10 membered cycloalkyl, wherein, R_{13} is C1-C6 alkyl;

preferably, R_4 is -$NR_{11}R_{12}$, wherein R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a 3-10 membered heterocycloalkyl, the heterocycloalkyl contains heteroatoms selected from N, O, S, the heterocycloalkyl is optionally substituted with a substituent selected from halogen, C1-C6 alkyl, 3-10 membered cycloalkyl, -C(=O)R_{13}, , R_{13} is C1-C6 alkyl;

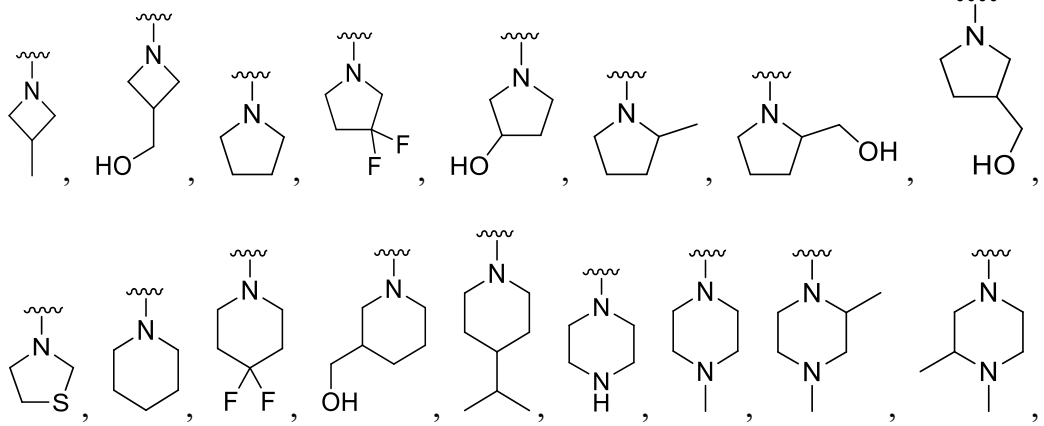
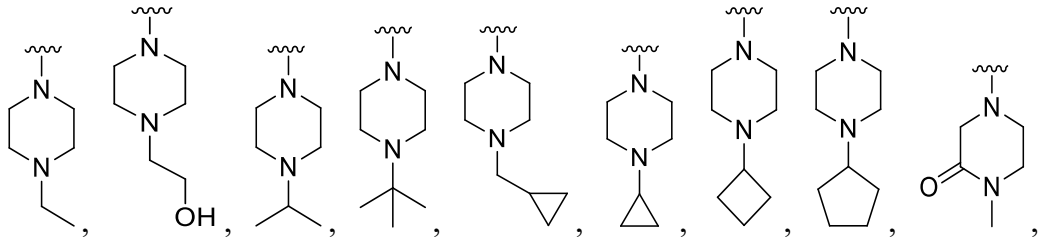
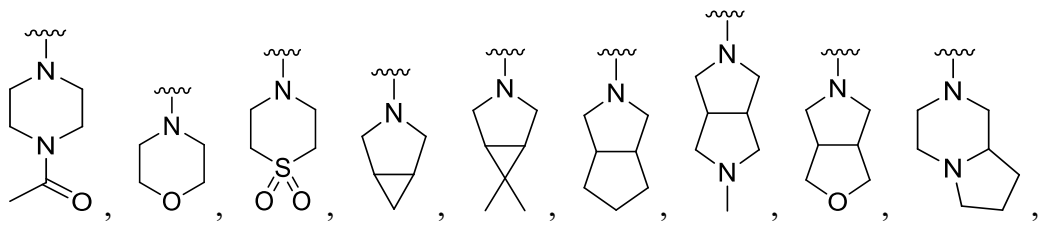
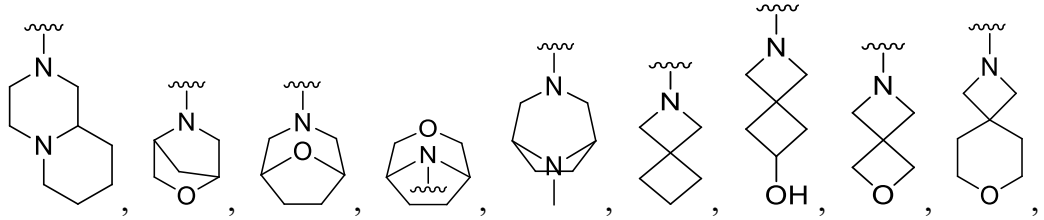
preferably, R_4 is -$NR_{11}R_{12}$, R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a 4-10 membered heterocycloalkyl, the heterocycloalkyl contains 1-2 heteroatoms selected from N, O, S, the heterocycloalkyl is optionally substituted with a substituent selected from halogen, C1-C6 alkyl, 3-5 membered cycloalkyl, -C(=O)R_{13}, , -OH, the alkyl is further optionally substituted with a substituent selected from -OH, 3-5 membered cycloalkyl, wherein, R_{13} is C1-C6 alkyl;

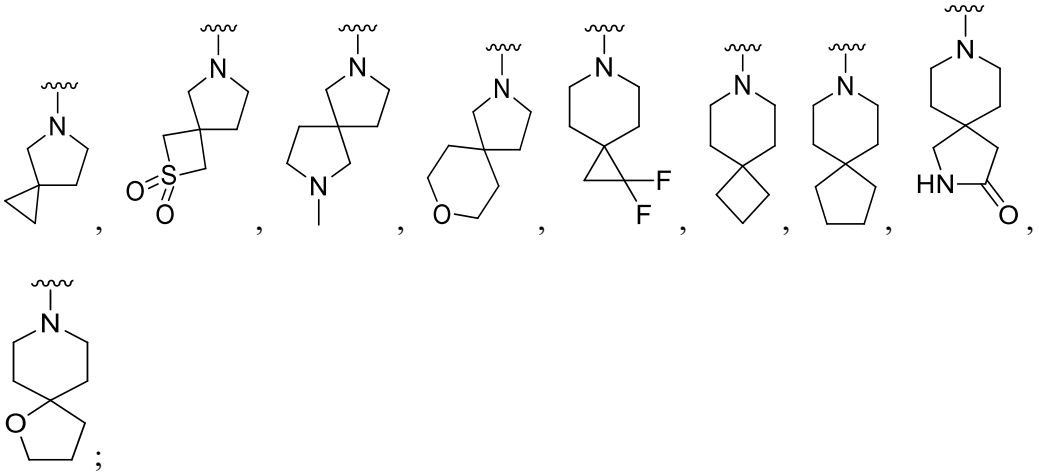
preferably, R_4 is -$NR_{11}R_{12}$, wherein R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a 4-6 membered heterocycloalkyl, the heterocycloalkyl contains 1-2 heteroatoms selected from N, O, S, the heterocycloalkyl is optionally substituted with a substituent selected from halogen, C1-C6 alkyl, -C(=O)R_{13}, , R_{13} is C1-C6 alkyl;

preferably, R_4 is -$NR_{11}R_{12}$, R_{11}, R_{12} and the nitrogen atom to which they are

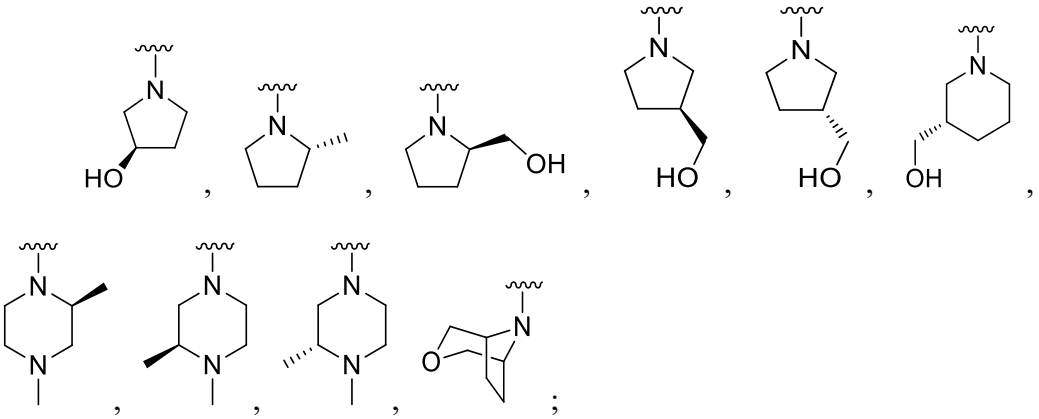
attached collectively form , the above groups are optionally substituted with a substituent selected from halogen, C1-C6 alkyl, 3-5 membered cycloalkyl, -C(=O)R_{13}, , -OH, the alkyl is further optionally substituted with a substituent selected from -OH, 3-5 membered cycloalkyl, wherein, R_{13} is C1-C6 alkyl;

preferably, R_4 is -$NR_{11}R_{12}$, wherein R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form azetidinyl, tetrahydropyrrolyl, tetrahydrothiazolyl, piperidinyl, piperazinyl, morpholinyl, thiomorpholinyl, 3-azabicyclo[3.1.0]hexyl, the above groups are optionally substituted with a substituent selected from fluorine, methyl, -C(=O)R_{13}, , R_{13} is methyl;

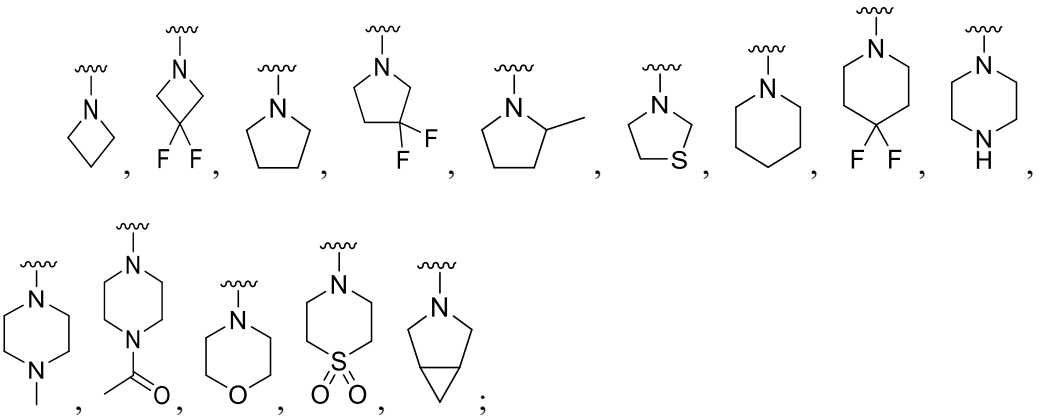
preferably, R_4 is $-NR_{11}R_{12}$, wherein R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form azetidinyl, piperazinyl, the above groups are optionally substituted with a substituent selected from fluorine, methyl, $-C(=O)R_{13}$, , R_{13} is methyl;preferably, R_4 is selected from: , , , , , , .

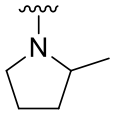
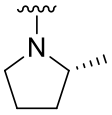


preferably, the configuration of R_4 is selected from at least one of the following:



preferably, R_4 is selected from:

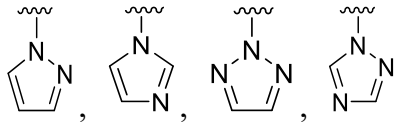


preferably,  is ;

preferably, R_4 is $-NR_{11}R_{12}$, wherein R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a 5-10 membered heteroaryl, the heteroaryl contains heteroatoms selected from N, O, S;

preferably, R_4 is $-NR_{11}R_{12}$, wherein R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a 5 membered heteroaryl, the heteroaryl contains 1-3 nitrogen heteroatoms;

preferably, R_4 is $-NR_{11}R_{12}$, wherein R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form pyrazolyl, imidazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl;

preferably, R_4 is selected from: .

3. The compound according to claim 1 or 2, wherein R_4 is $-NR_{11}R_{12}$, wherein R_{11}, R_{12} are independently selected from H, alkyl, cycloalkyl, the alkyl is optionally substituted with a substituent selected from -OH, alkenyl, the cycloalkyl is optionally substituted with alkyl; or, R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a heterocycloalkyl, the heterocycloalkyl is optionally substituted with a substituent selected from halogen, alkyl, cycloalkyl, $-C(=O)R_{13}$, , R_{13} is alkyl; or, R_{11}, R_{12} and the nitrogen atom to which they are attached collectively form a heteroaryl;

preferably, R_4 is $-NR_{11}R_{12}$, R_{11}, R_{12} are independently selected from H, C1-

C6 alkyl, 3-10 membered cycloalkyl, 3-10 membered heterocycloalkyl, the heterocycloalkyl contains heteroatoms selected from N, O, S; wherein, when R_{11} and/or R_{12} are C1-C6 alkyl, the alkyl is optionally substituted with a substituent selected from halogen, $-NR_{14}R_{15}$, 3-10 membered cycloalkyl, R_{14}, R_{15} are independently selected from H, C1-C6 alkyl; when R_{11} and/or R_{12} are selected from 3-10 membered cycloalkyl, 3-10 membered heterocycloalkyl, the cycloalkyl, heterocycloalkyl are optionally substituted with C1-C6 alkyl;

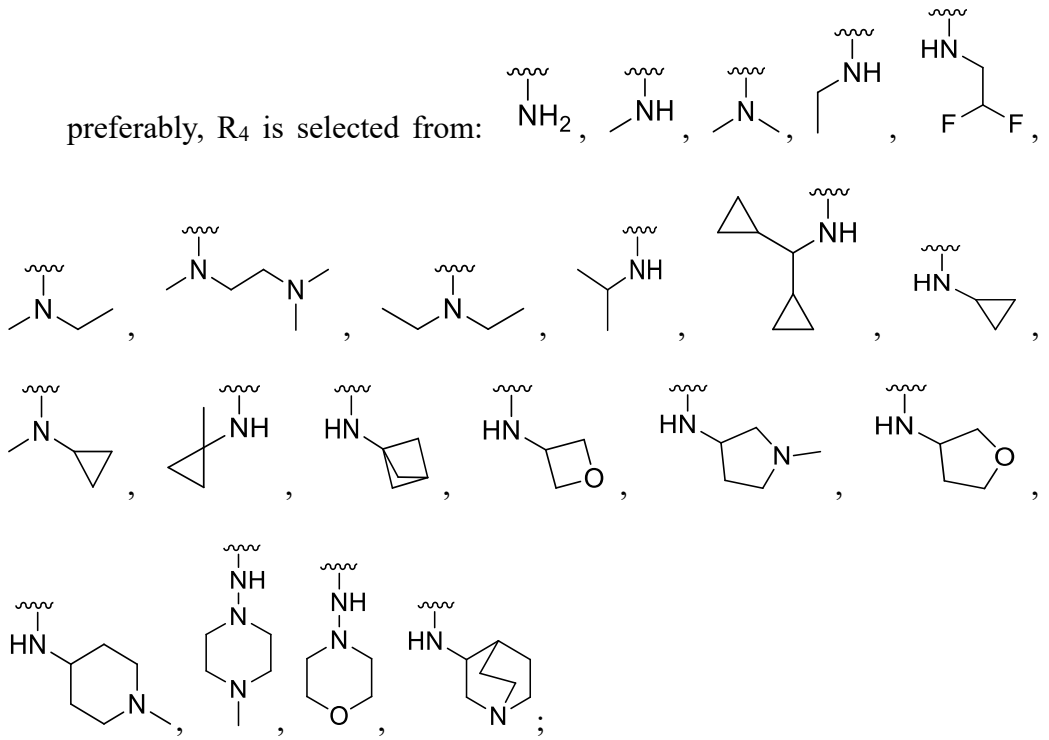
preferably, R_4 is $-NR_{11}R_{12}$, R_{11}, R_{12} are independently selected from H, C1-C6 alkyl, 3~8 membered cycloalkyl, 4-8 membered heterocycloalkyl, the heterocycloalkyl contains 1-2 heteroatoms selected from N, O; wherein, when R_{11} and/or R_{12} are C1-C6 alkyl, the alkyl is optionally substituted with a substituent selected from halogen, $-NR_{14}R_{15}$, 3-8 membered cycloalkyl, R_{14}, R_{15} are independently selected from H, C1-C6 alkyl; when R_{11} and/or R_{12} are selected from 3-8 membered cycloalkyl, 4-8 membered heterocycloalkyl, the cycloalkyl, heterocycloalkyl are optionally substituted with C1-C6 alkyl;

preferably, R_4 is $-NR_{11}R_{12}$, wherein R_{11}, R_{12} are independently selected from H, C1-C6 alkyl, 3-10 membered cycloalkyl, the C1-C6 alkyl is optionally substituted with a substituent selected from -OH, C2-C6 alkenyl, the 3-10 membered cycloalkyl is optionally substituted with C1-C6 alkyl;

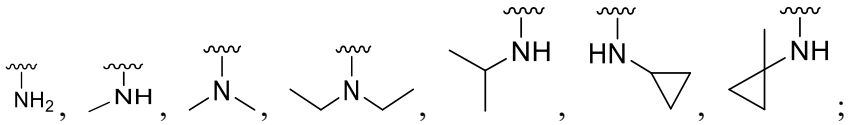
preferably, R_4 is $-NR_{11}R_{12}$, wherein R_{11}, R_{12} are independently selected from H, C1-C6 alkyl, 3-5 membered cycloalkyl, the C1-C6 alkyl is optionally substituted with a substituent selected from -OH, C2-C6 alkenyl, the 3-5 membered cycloalkyl is optionally substituted with C1-C6 alkyl;

preferably, R_4 is $-NR_{11}R_{12}$, R_{11}, R_{12} are independently selected from H, C1-C6 alkyl, cyclopropyl, bicyclo[1.1.1]pentyl, oxacyclobutyl, tetrahydropyrrolyl, tetrahydrofuranyl, piperidinyl, piperazinyl, morpholinyl, 1-azabicyclo[2.2.2]octyl; wherein, when R_{11} and/or R_{12} are C1-C6 alkyl, the alkyl is optionally substituted with a substituent selected from halogen, $-NR_{14}R_{15}$, 3 membered cycloalkyl, R_{14}, R_{15} are independently selected from H, C1-C6 alkyl; when R_{11} and/or R_{12} are selected from cyclopropyl, bicyclo[1.1.1]pentyl, oxacyclobutyl, tetrahydropyrrolyl, tetrahydrofuranyl, piperidinyl, piperazinyl, morpholinyl, 1-azabicyclo[2.2.2]octyl, the above groups are optionally substituted with C1-C6 alkyl;

preferably, R_4 is $-NR_{11}R_{12}$, wherein R_{11}, R_{12} are independently selected from H, methyl, ethyl, propyl, cyclopropyl, the cyclopropyl is optionally substituted with methyl;

preferably, R_4 is selected from: 

preferably, R_4 is selected from:



preferably, R_4 is .

4. The compound according to any one of claims 1-3, wherein, ring A is selected from aryl, heteroaryl, the aryl, heteroaryl are optionally substituted with a substituent selected from halogen, alkyl, alkoxy, -OH, -CN, $-NR_5R_6$, $-SF_5$, $-SO_2R_{10}$, the alkyl, alkoxy are further optionally substituted with a substituent selected from halogen, $-NR_5R_6$, wherein, R_5, R_6 are independently selected from H, alkyl, R_{10} is alkyl and optionally substituted with halogen;

preferably, ring A is selected from 6-12 membered aryl, 5-12 membered heteroaryl, the heteroaryl contains heteroatoms selected from N, O, S, the substituents of the above groups are as defined in any one of claims 1-3;

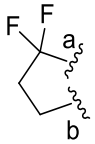
preferably, ring A is phenyl, the substituents thereof are as defined in any one of claims 1-3.

5. The compound according to any one of claims 1-4, wherein, the substituent contained in ring A is selected from halogen, C1-C6 alkyl, C1-C6 alkoxy, -OH, -CN, $-NR_5R_6$, $-SF_5$, $-SO_2R_{10}$, the alkyl, alkoxy are further optionally substituted with a substituent selected from halogen, $-NR_5R_6$, -OH, wherein, R_5, R_6 are independently selected from H, C1-C6 alkyl, R_{10} is C1-C6 alkyl and

optionally substituted with halogen; or, two substituents on ring A are connected to form a 5-6 membered aliphatic carbocyclic ring, the aliphatic carbocyclic ring is optionally substituted with halogen;

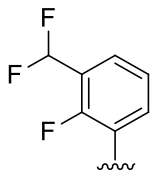
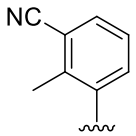
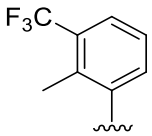
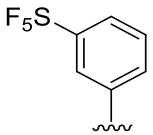
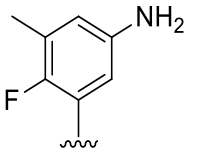
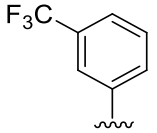
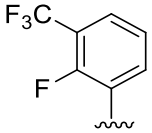
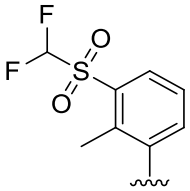
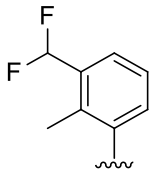
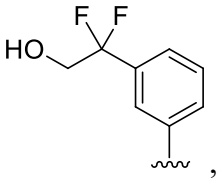
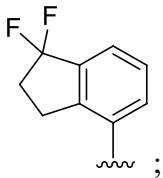
preferably, the substituent contained in ring A is selected from halogen, C1-C6 alkyl, -CN, $-NR_5R_6$, $-SF_5$, $-SO_2R_{10}$, the alkyl is further optionally substituted with a substituent selected from halogen, -OH, wherein, R_5, R_6 are independently selected from H, C1-C6 alkyl, R_{10} is C1-C6 alkyl and optionally substituted with halogen; or, two substituents on ring A are connected to form a 5-6 membered aliphatic carbocyclic ring, the aliphatic carbocyclic ring isoptionally substituted with halogen; preferably, the substituent contained in ring A is selected from halogen, C1-C6 alkyl, C1-C6 alkoxy, -OH, -CN, $-NR_5R_6$, $-SF_5$, $-SO_2R_{10}$, the alkyl, alkoxy are further optionally substituted with a substituent selected from halogen, $-NR_5R_6$, wherein, R_5, R_6 are independently selected from H, C1-C6 alkyl, R_{10} is C1-C6 alkyl and optionally substituted with halogen;

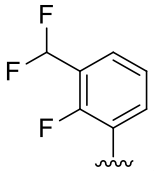
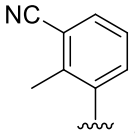
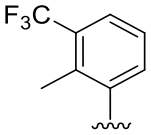
preferably, the substituent contained in ring A is selected from halogen, C1-C6 alkyl, -CN, $-NR_5R_6$, the alkyl is further optionally substituted with halogen, R_5, R_6 are independently selected from H, C1-C6 alkyl;

preferably, the substituent contained in ring A is selected from -F, $-CH_3$, $-CHF_2$, $-CF_3$, -CN, $-NH_2$, $-SF_5$, $-SO_2CHF_2$, $-CF_2CH_2OH$; or, two substituents on ring A are connected to form 

, wherein the two ends of a and b are respectively connected to two adjacent ring carbon atoms on ring A;

preferably, the substituent contained in ring A is selected from -F, $-CH_3$, $-CHF_2$, $-CF_3$, -CN, $-NH_2$.

6. The compound according to any one of claims 1-4, wherein, ring A is selected from: , , , , , , , , , , ;

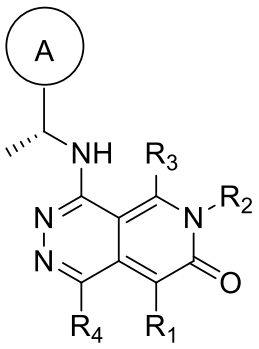
preferably, ring A is selected from: , , .

7. The compound according to any one of claims 1-5, wherein, R_a, R_b, R_c are independently selected from H, C1-C6 alkyl;

preferably, R_a, R_b, R_c are independently selected from H, methyl;

preferably, R_a is methyl, R_b is H, R_c is H.

8. The compound according to any one of claims 1-6, wherein, the structure is represented by Formula II:



Formula II

wherein each group is as defined in any one of claims 1-7.

9. The compound according to any one of claims 1-7, wherein, R_1, R_3 are independently selected from H, halogen, C1-C6 alkyl, C1~C6 alkoxy, -OH, -CN, -NR_7R_8, the alkyl, alkoxy are optionally substituted with a substituent selected from halogen, -NR_7R_8, wherein R_7, R_8 are independently selected from H, C1-C6 alkyl;

preferably, R_1, R_3 are independently selected from H, C1-C6 alkyl, C1-C6 alkoxy, -OH, -CN, -NR_7R_8, the alkyl, alkoxy are optionally substituted with a substituent selected from halogen, -NR_7R_8, wherein R_7, R_8 are independently selected from H, alkyl;

preferably, R_1, R_3 are independently selected from H, C1-C6 alkyl, C1-C6 alkoxy, -OH, -CN, -NR_7R_8, the alkyl, alkoxy are optionally substituted with a substituent selected from halogen, -NR_7R_8, wherein R_7, R_8 are independently selected from H, C1-C6 alkyl;

preferably, both R_1, R_3 are H.

10. The compound according to any one of claims 1-9, wherein, R_2 is selected from H, C1~C6 alkyl, 3-10 membered cycloalkyl, 3-10 membered heterocycloalkyl, 3-10 membered cycloalkenyl, 3-10 membered heterocycloalkenyl, the cycloalkyl, heterocycloalkyl, cycloalkenyl, heterocycloalkenyl are optionally substituted with a substituent selected from halogen, C1-C6 alkyl, C1-C6 alkoxy, , -C(=O)R_9, R_9 is selected from C1-C6 alkyl, 3-10 membered cycloalkyl, 3-10 membered heterocycloalkyl, the heterocycloalkyl, heterocycloalkenyl contain heteroatoms selected from N, O, S;

preferably, R_2 is selected from H, C1-C6 alkyl, 3-10 membered cycloalkyl, 3-10 membered heterocycloalkyl, 3-10 membered heterocycloalkenyl, the cycloalkyl, heterocycloalkyl, heterocycloalkenyl are optionally substituted with a substituent selected from C1-C6 alkyl, C1-C6 alkoxy, -C(=O)R_9, R_9 is selected from C1-C6 alkyl, 3-10 membered heterocycloalkyl, the heterocycloalkyl, heterocycloalkenyl contain 1-2 heteroatoms selected from N, O, S;

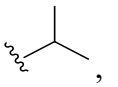
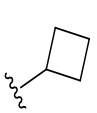
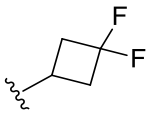
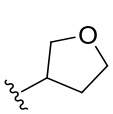
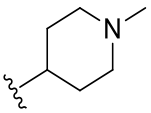
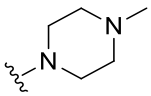
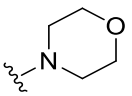
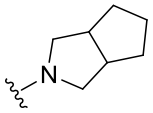
preferably, R_2 is selected from H, C1-C6 alkyl, 3 membered cycloalkyl, 5-6 membered heterocycloalkyl, 6 membered heterocycloalkenyl, the cycloalkyl, heterocycloalkyl, heterocycloalkenyl are optionally substituted with a substituent selected from C1-C6 alkyl, C1-C6 alkoxy, -C(=O)R_9, R_9 is selected from C1-C6 alkyl, 6 membered heterocycloalkyl, the heterocycloalkyl, heterocycloalkenyl contain 1~2 heteroatoms selected from N, O;

preferably, R_2 is selected from C1-C6 alkyl, 3~8 membered cycloalkyl, 5-8 membered heterocycloalkyl, the cycloalkyl, heterocycloalkyl are optionally substituted with a substituent selected from halogen, C1-C6 alkyl, the heterocycloalkyl contains 1-2 heteroatoms selected from N, O;

preferably, R_2 is C1-C6 alkyl; or,

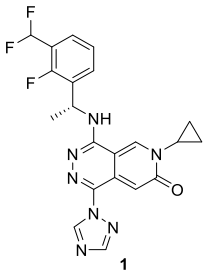
R_2 is selected from cyclopropyl, cyclobutyl, tetrahydrofuranyl, piperidinyl, piperazinyl, morpholinyl, 3-azabicyclo[3.3.0]octy, the above groups are optionally substituted with a substituent selected from halogen, C1-C6 alkyl;

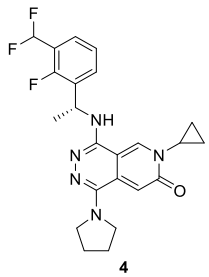
preferably, R_2 is cyclopropyl, the cyclopropyl is optionally substituted with C1-C6 alkyl;

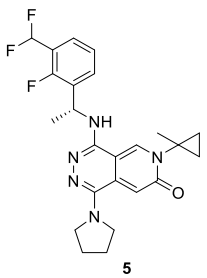
preferably, R_2 is selected from: methyl, ethyl, , , , , , , , , , ;

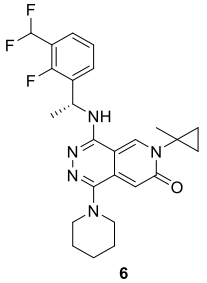
preferably, R_2 is selected from: , .

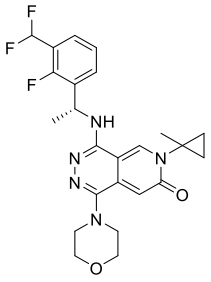
11. The compound according to any one of claims 1-14, wherein, the compound is selected from one of the following:


1

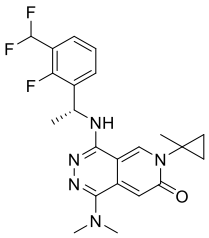

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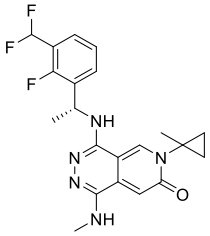

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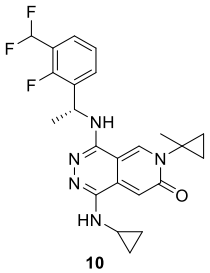
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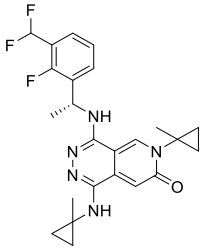
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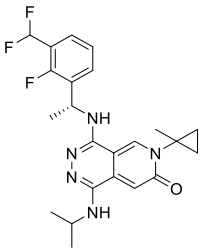
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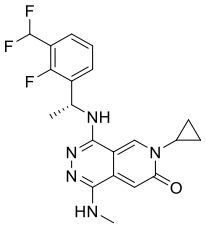
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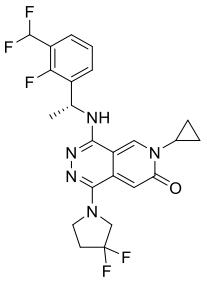
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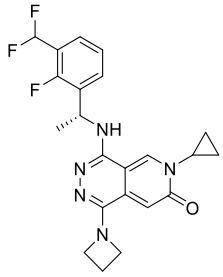
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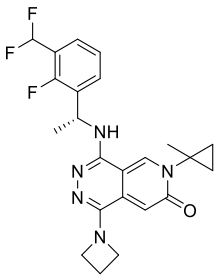
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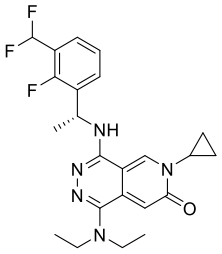
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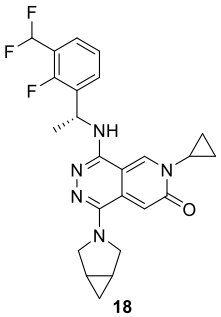
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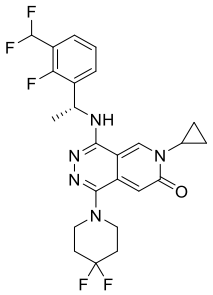
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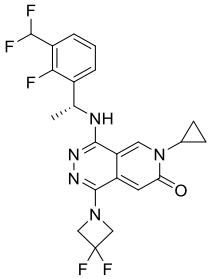
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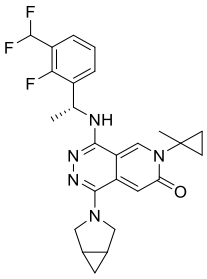
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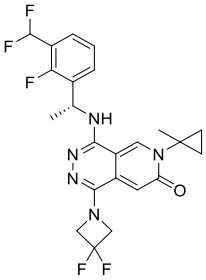
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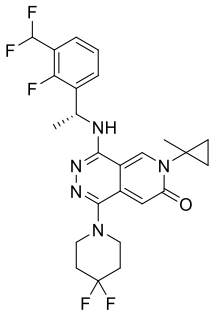
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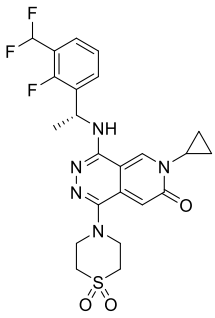
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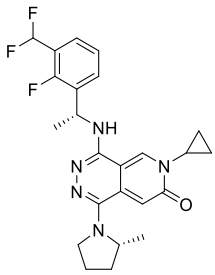
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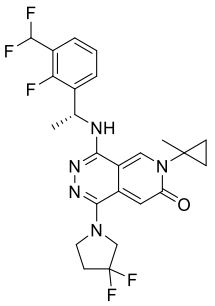
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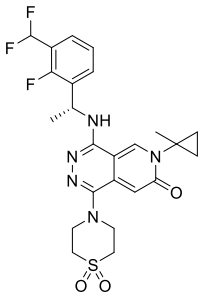
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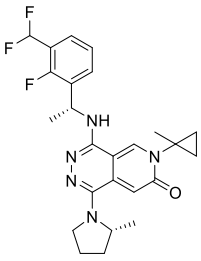
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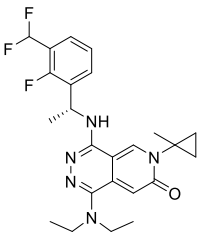
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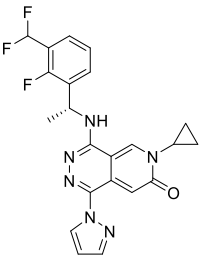
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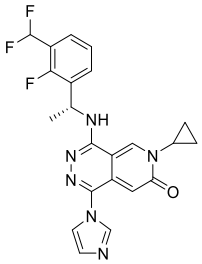
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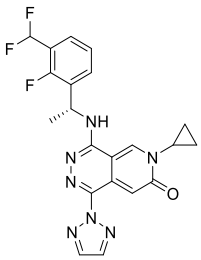
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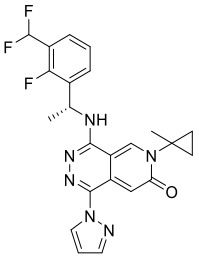
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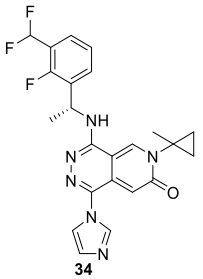
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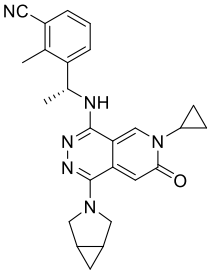
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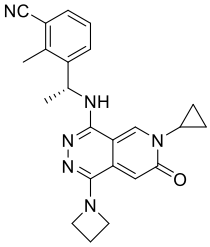
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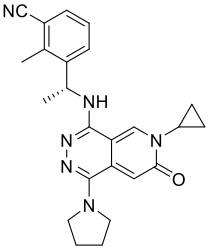
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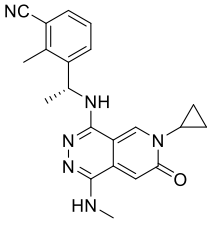
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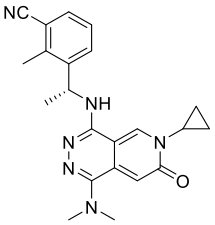
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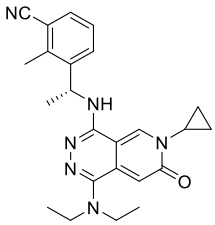


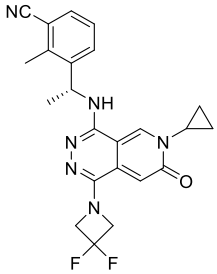
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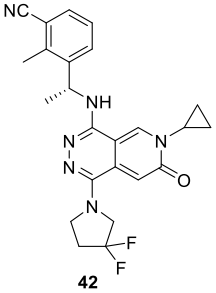


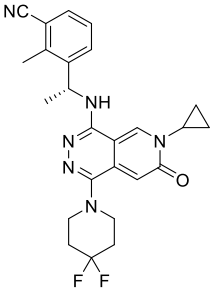
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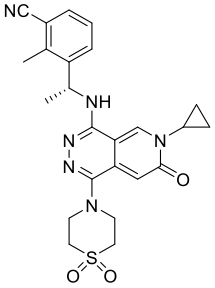

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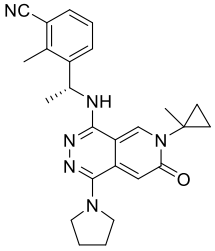

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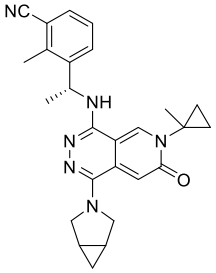

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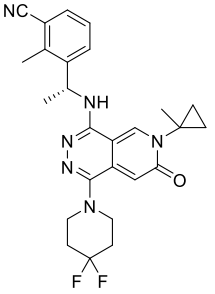

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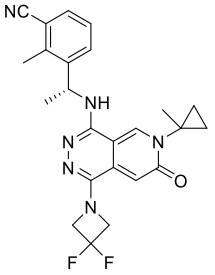

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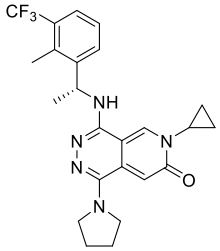

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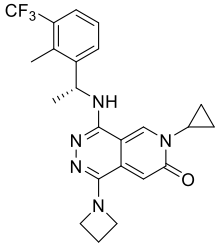

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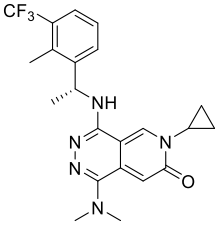

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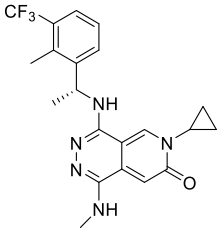

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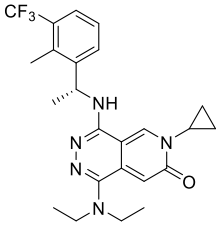

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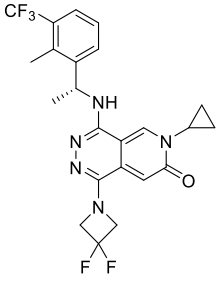

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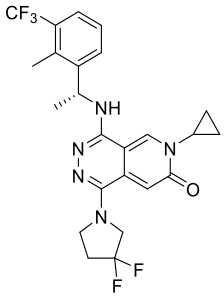

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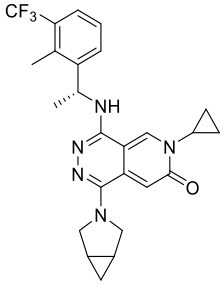

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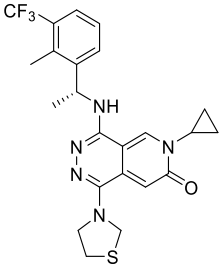

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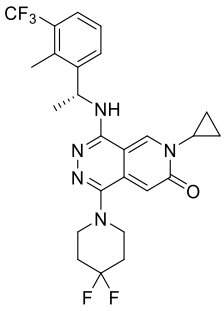
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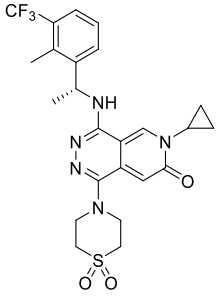
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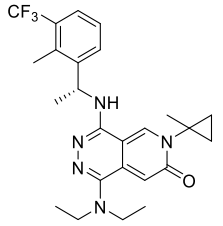
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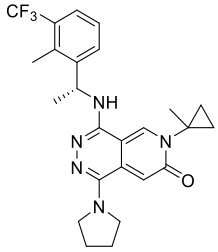
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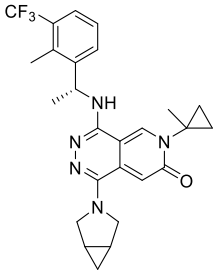
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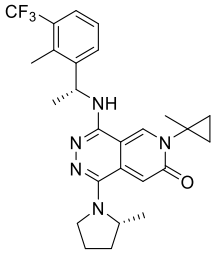
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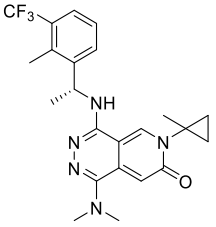
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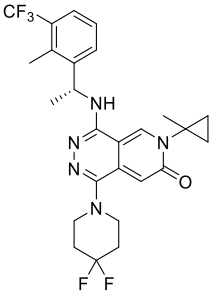
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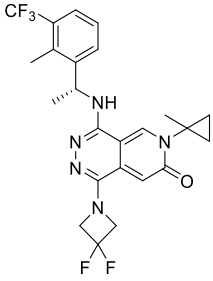
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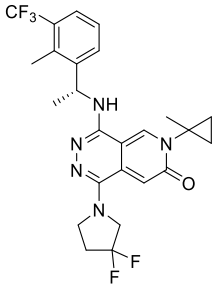
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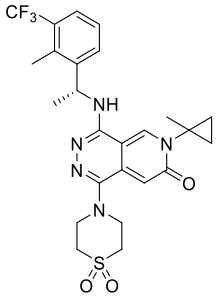
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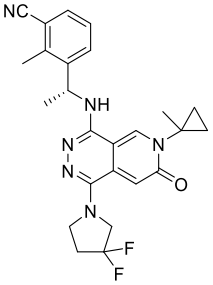
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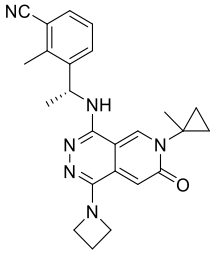
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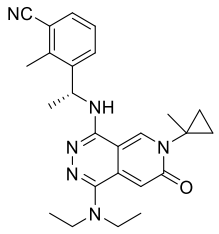
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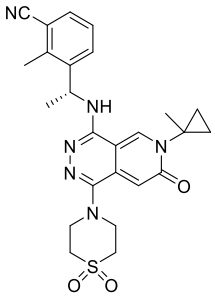
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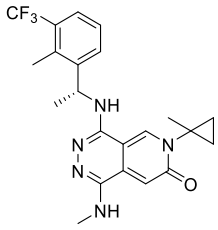
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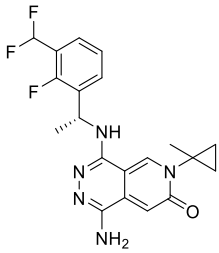
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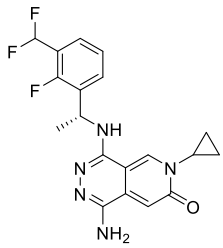
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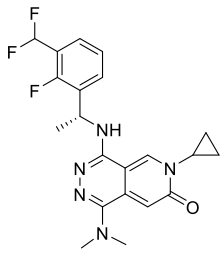
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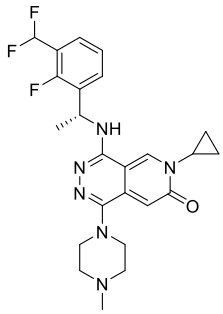
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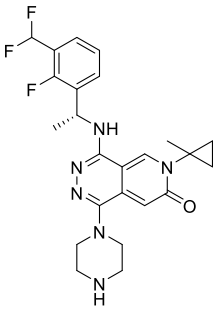
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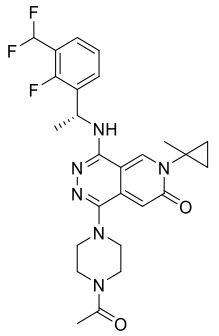
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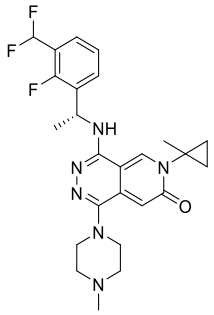
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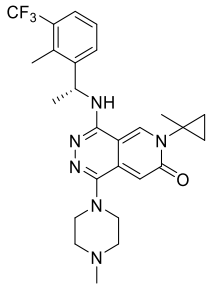
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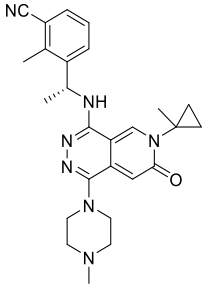
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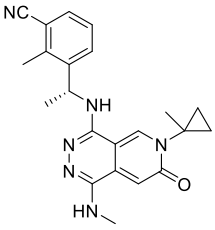
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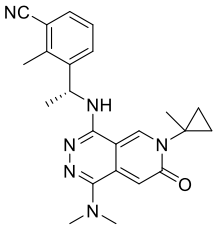
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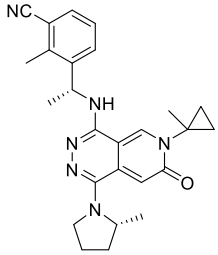
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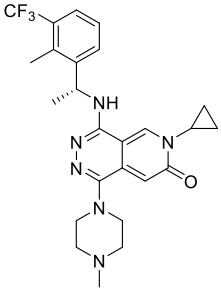
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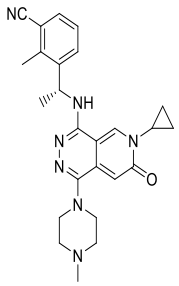
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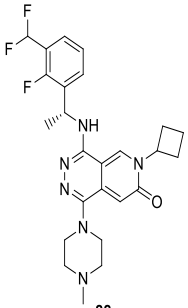
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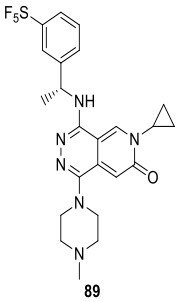
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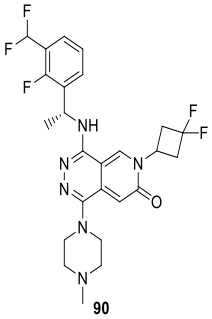
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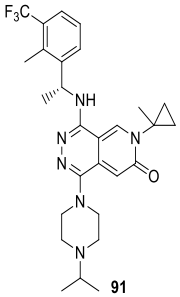
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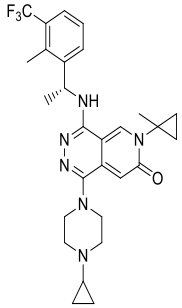
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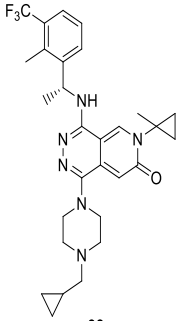
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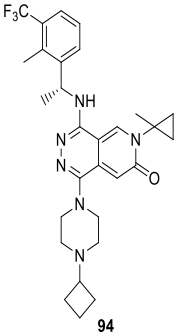
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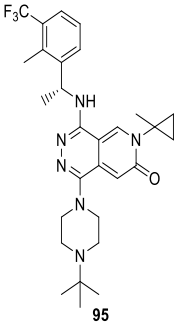
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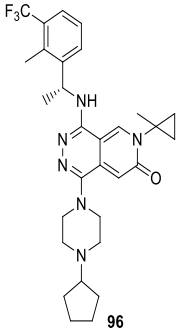
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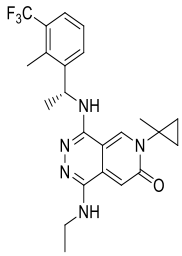
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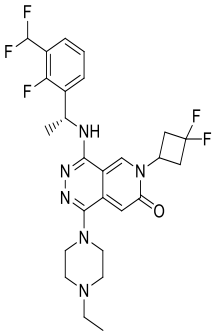
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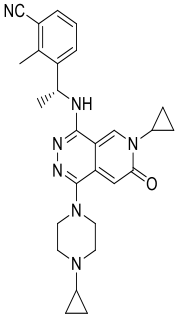
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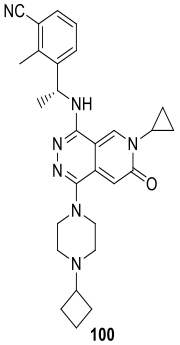
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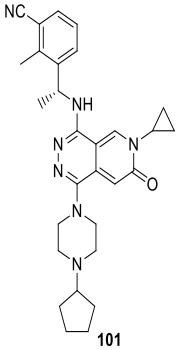
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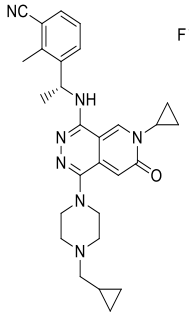
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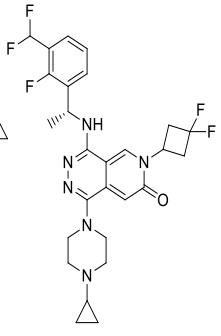
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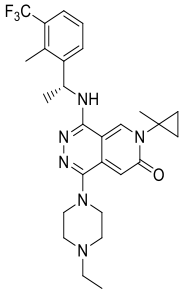
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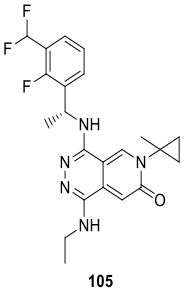
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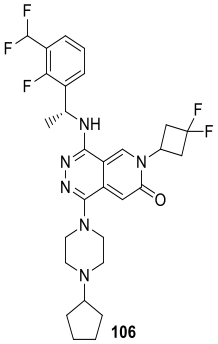
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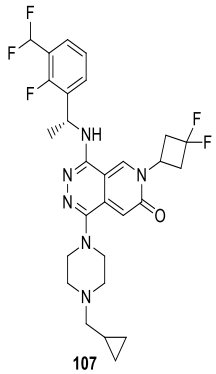
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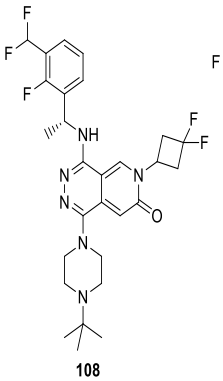
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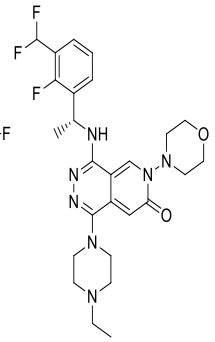
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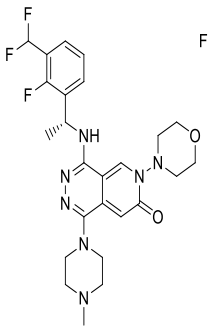
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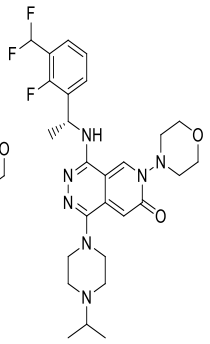
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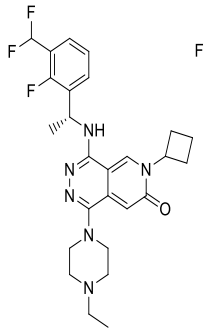
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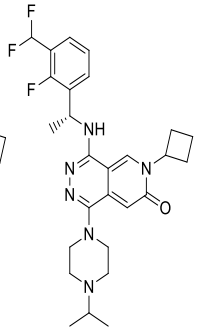
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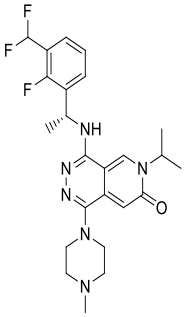
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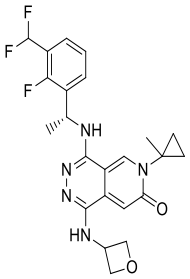
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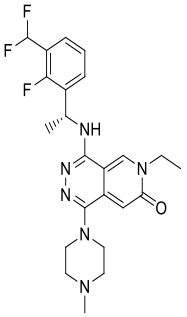
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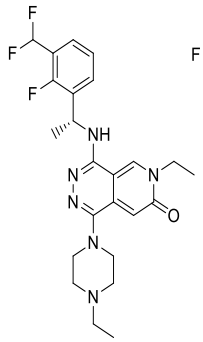
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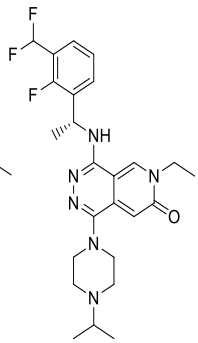
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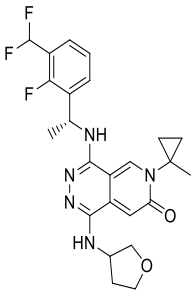
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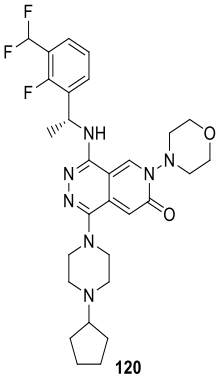
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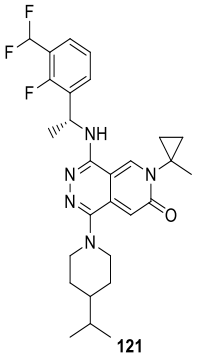
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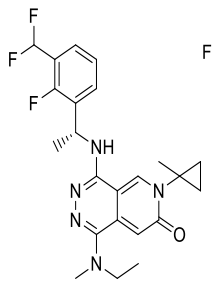
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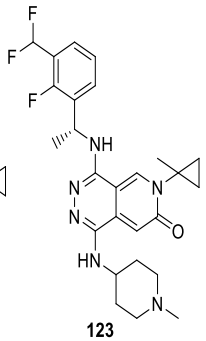
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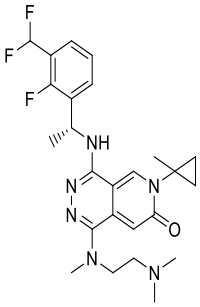
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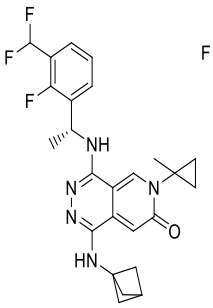
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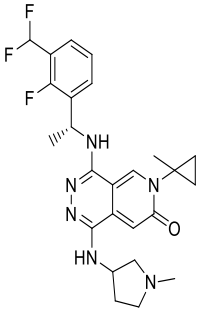
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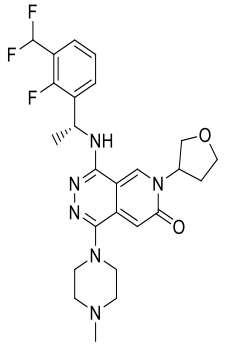
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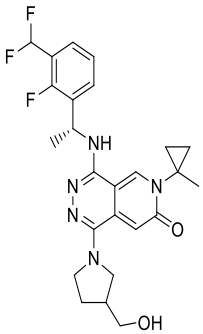
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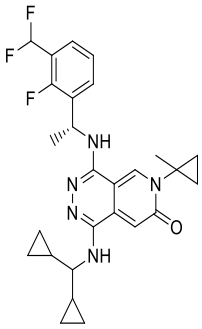
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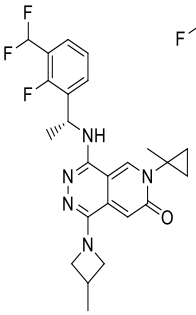
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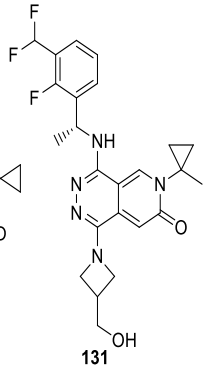
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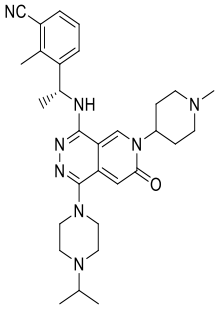
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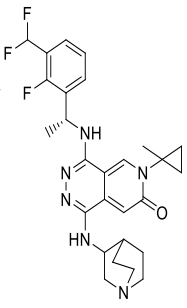
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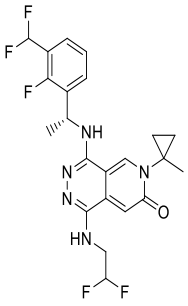
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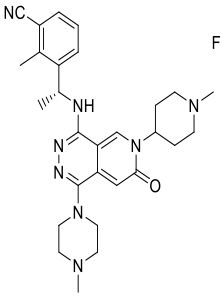
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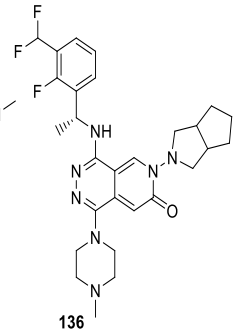
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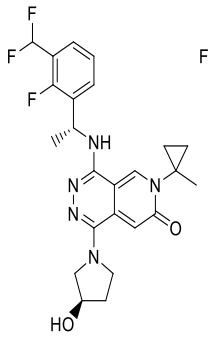
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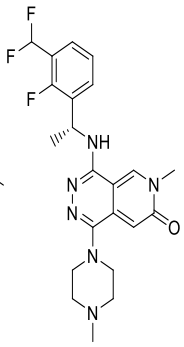
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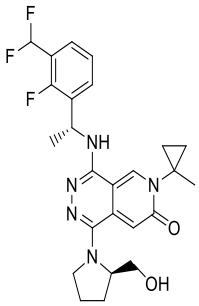
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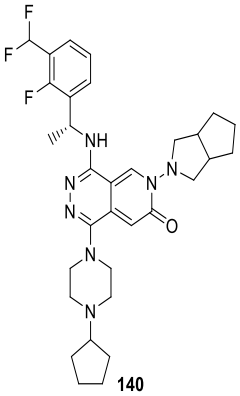
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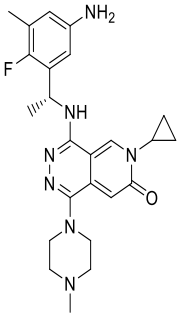
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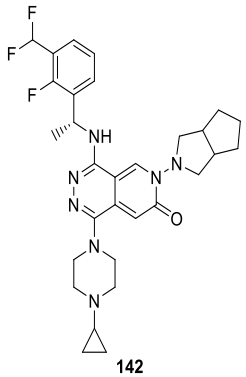
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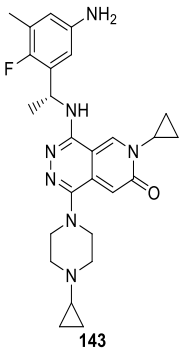
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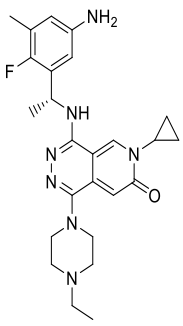
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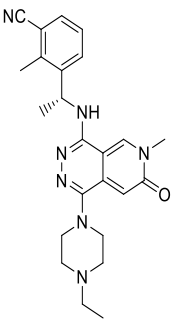
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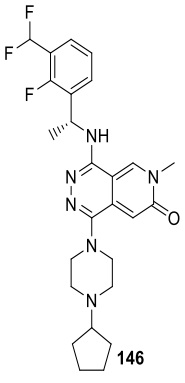
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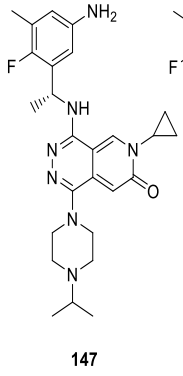
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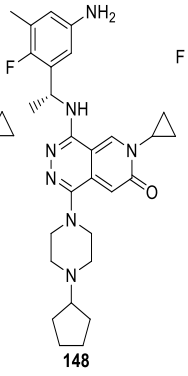
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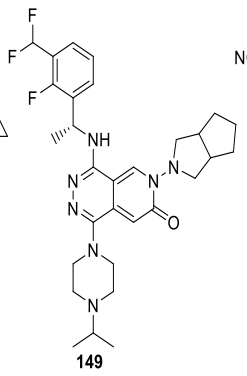
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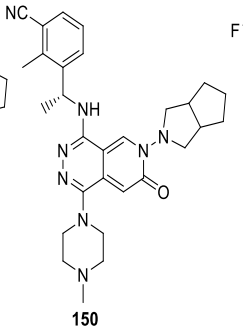
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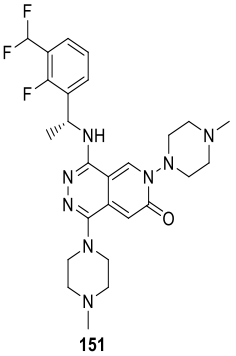
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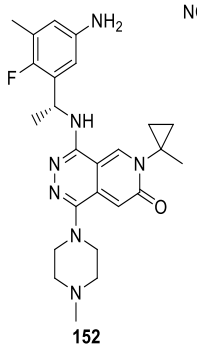
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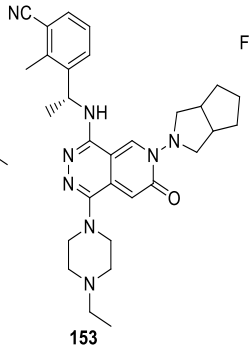
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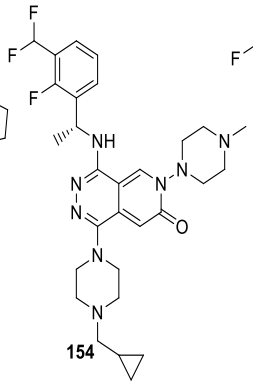
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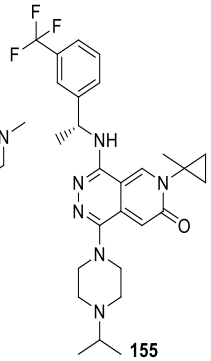
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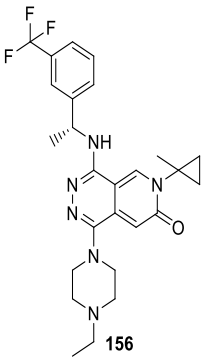
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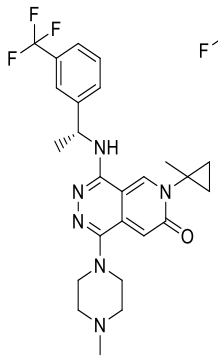
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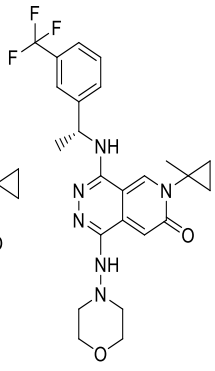
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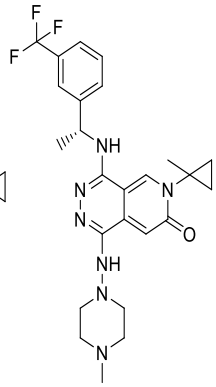
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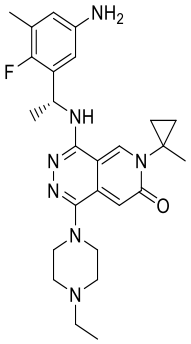
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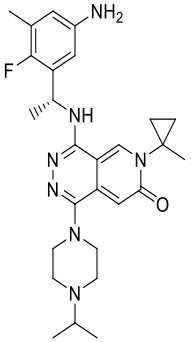
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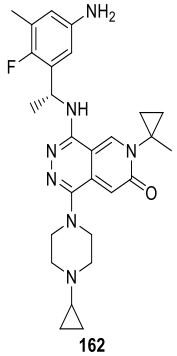
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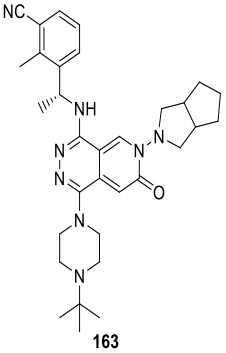
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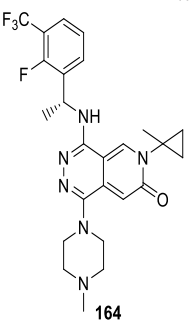
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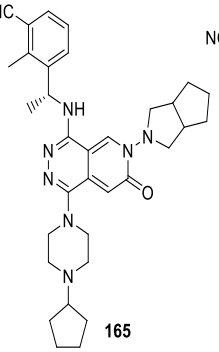
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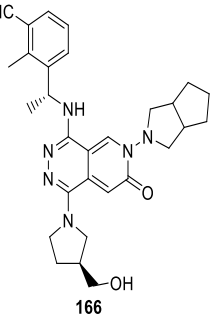
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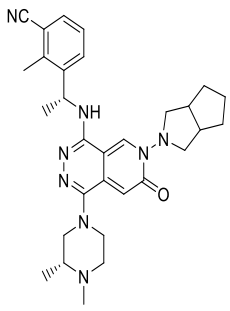
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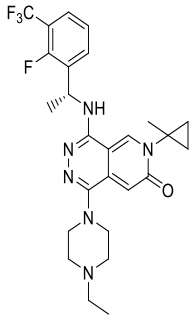
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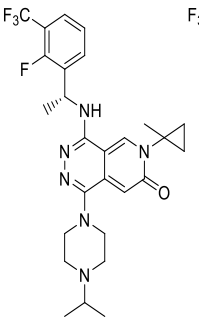
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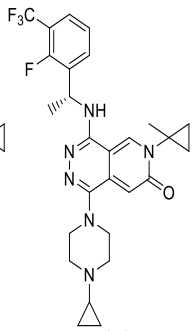
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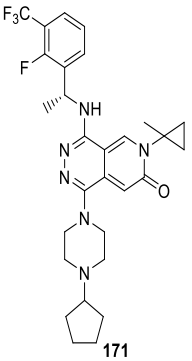
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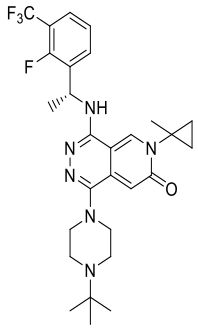
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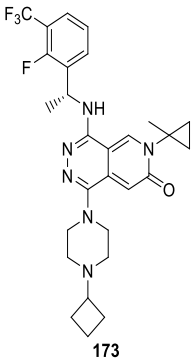
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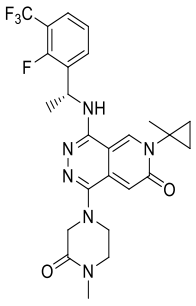
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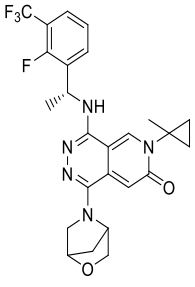
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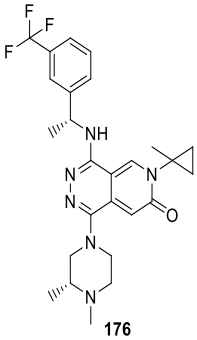
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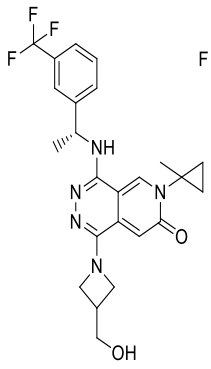
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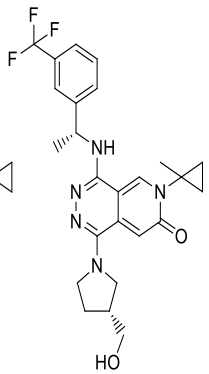
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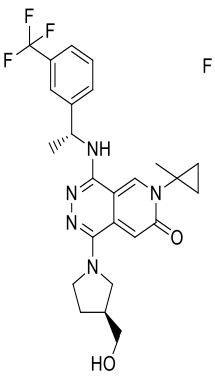
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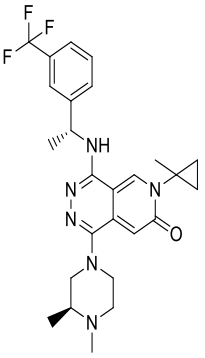
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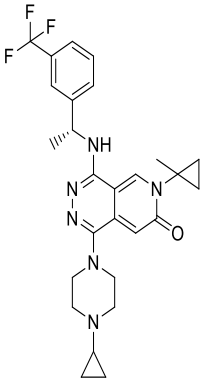
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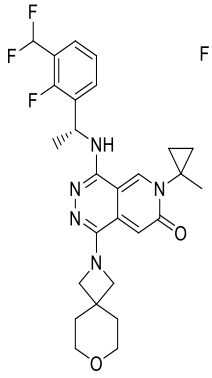
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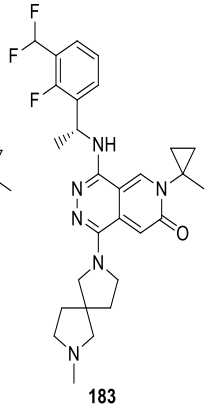
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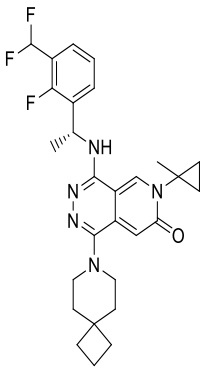
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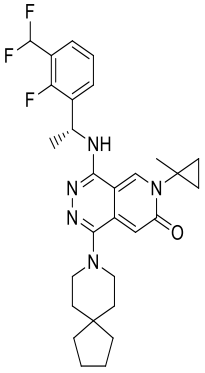
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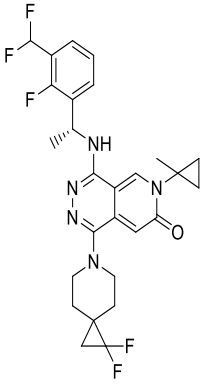
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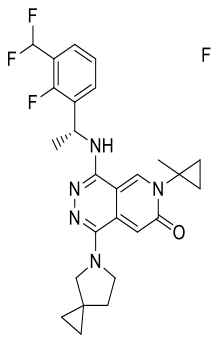
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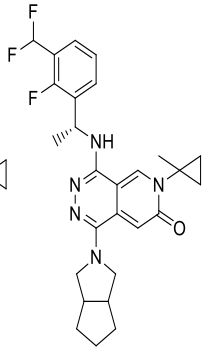


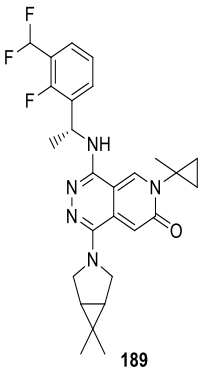
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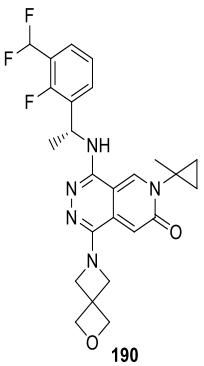


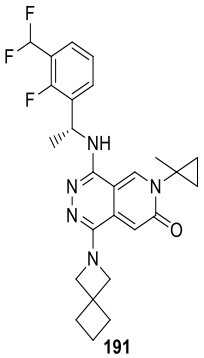
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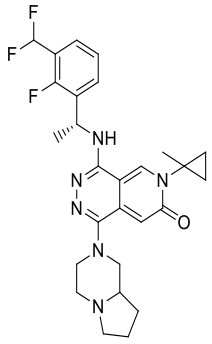

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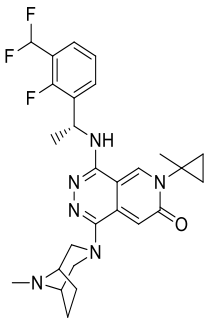

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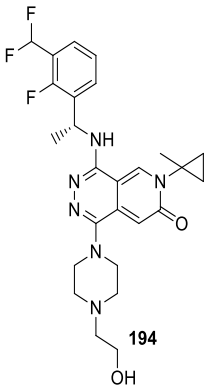

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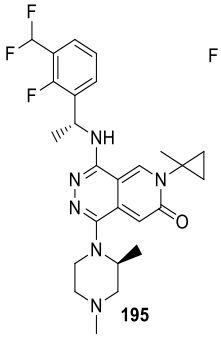

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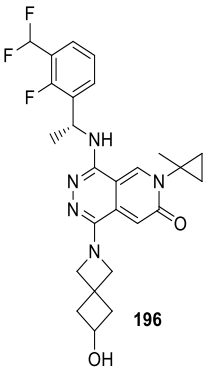

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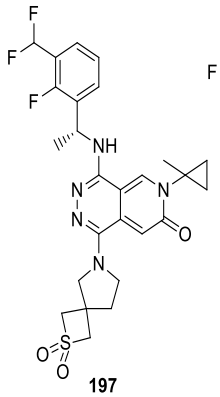

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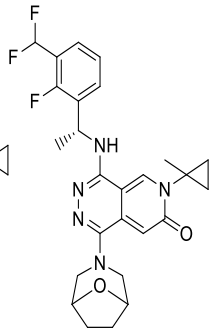

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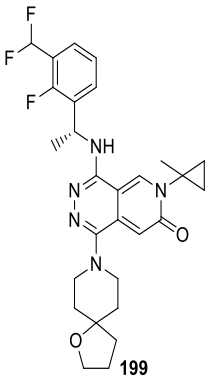

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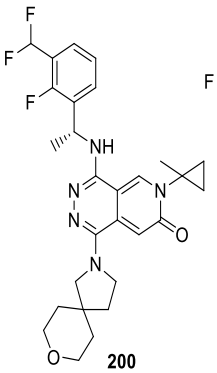

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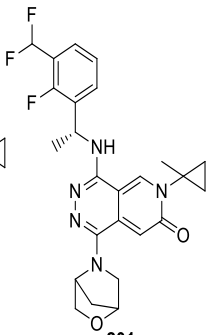

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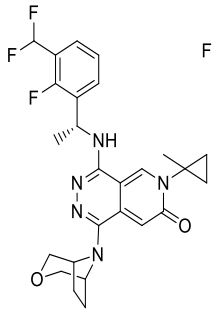

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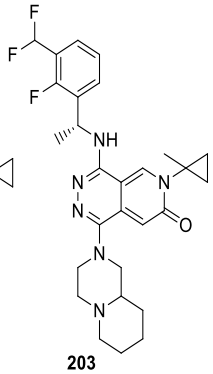

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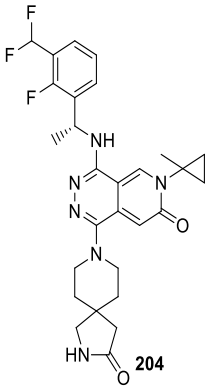

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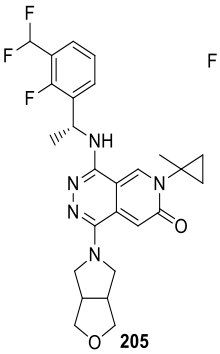

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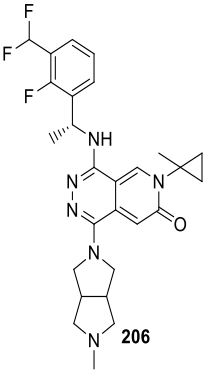

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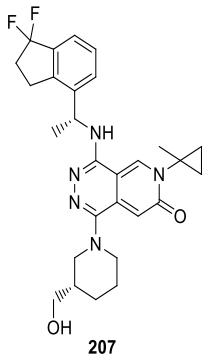

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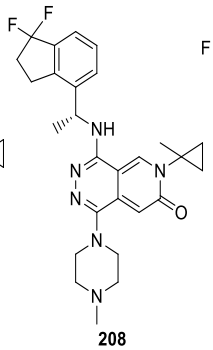

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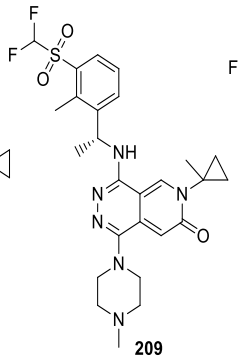

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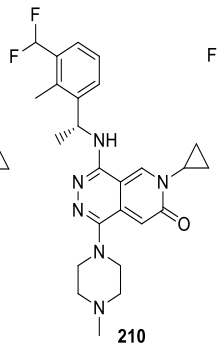

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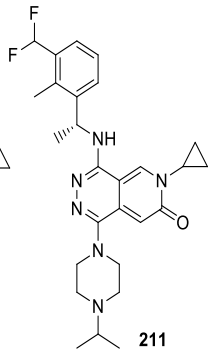

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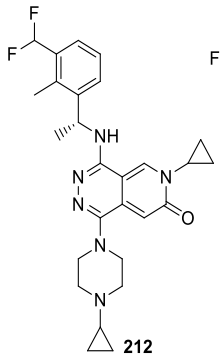

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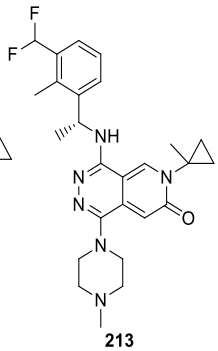

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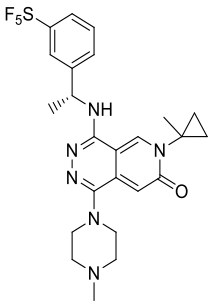

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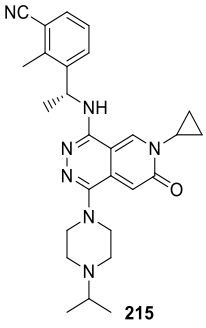

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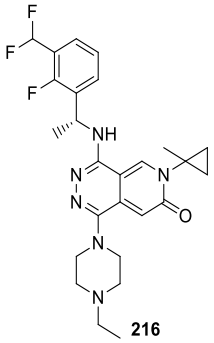

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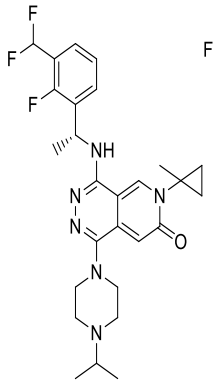

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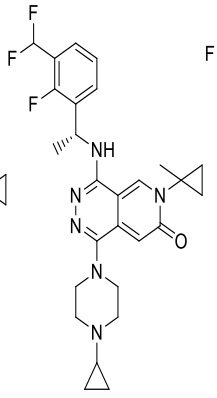

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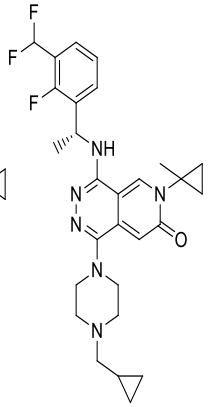

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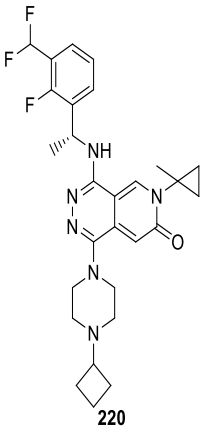

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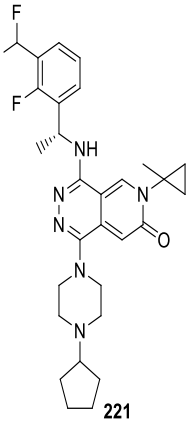

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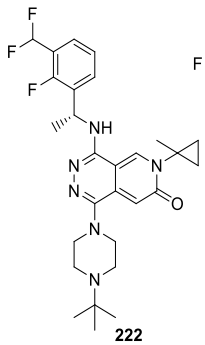

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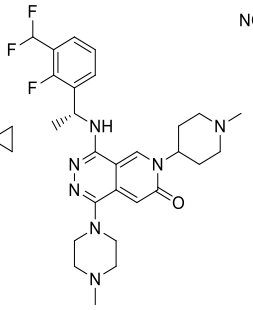

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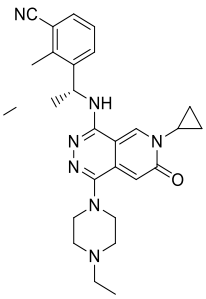

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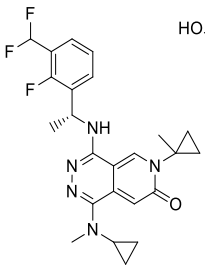

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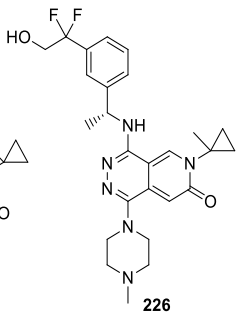

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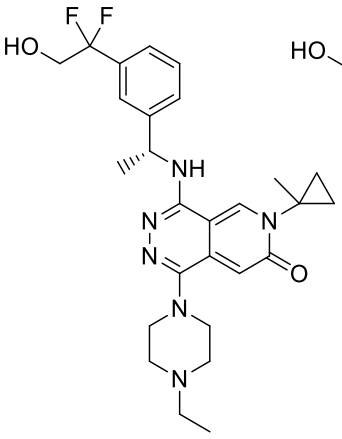

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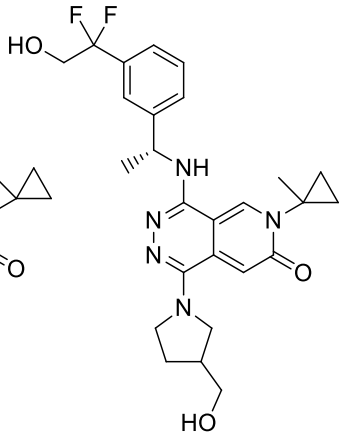

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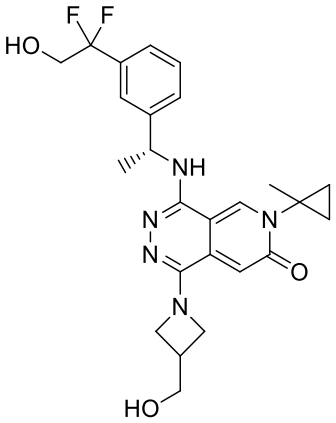

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12. A pharmaceutical composition, wherein, the pharmaceutical composition comprises the compound according to any one of claims 1-15, or tautomer, stereoisomer, solvate, metabolite, isotopically labeled compound, pharmaceutically acceptable salt or co-crystal thereof, and a pharmaceutically acceptable excipient or an accessory ingredient.

13. Use of the compound according to any one of claims 1-15, or tautomer, stereoisomer, solvate, metabolite, isotopically labeled compound, pharmaceutically acceptable salt or co-crystal thereof, or the pharmaceutical composition according to claim 12 in the manufacture of a medicament for treating a disease mediated by SOS1;

preferably

, the disease is selected from: cancer, pathogenic skin rash disease;

preferably

, the cancer is selected from: non-small cell lung cancer, lung cancer, pancreatic cancer, ovarian cancer, bladder cancer, prostate cancer, chronic

granulocytic leukemia, colorectal cancer, brain cancer, liver cancer, kidney cancer, gastric cancer, and breast cancer;

the pathogenic skin rash disease is selected from: Noonan syndrome, cardiofaciocutaneous syndrome, hereditary gingival fibromatosis type I.

14. The compound according to any one of claims 1-11, or tautomer, stereoisomer, solvate, metabolite, isotopically labeled compound, pharmaceutically acceptable salt or co-crystal thereof, or the pharmaceutical composition according to claim 12, for use in treating a disease mediated by SOS1;

preferably, the disease is selected from: cancer, pathogenic skin rash disease;

preferably, the cancer is selected from: non-small cell lung cancer, lung cancer, pancreatic cancer, ovarian cancer, bladder cancer, prostate cancer, chronic granulocytic leukemia, colorectal cancer, brain cancer, liver cancer, kidney cancer, gastric cancer, and breast cancer;

the pathogenic skin rash disease is selected from: Noonan syndrome, cardiofaciocutaneous syndrome, hereditary gingival fibromatosis type I.