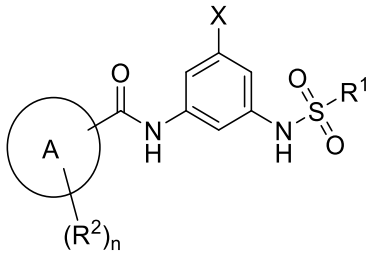
CLAIMS

1. A compound as shown in formula (I), or a stereoisomer thereof, a tautomer thereof or a pharmaceutically acceptable salt thereof:



(I)

wherein:

a ring A is selected from tricyclic heteroaryl or a tricyclic fused ring;

X is selected from halogen;

R^1 is selected from C_{1-6} alkyl or 3-5 membered cycloalkyl; wherein the alkyl or cycloalkyl is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

each R^2 is independently selected from a hydrogen atom, cyano, halogen, alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclyl, aryl, heteroaryl, SF_5, $-O(CH_2)_tR^A$, $-C(O)R^3$, $-C(O)OR^3$, $-NHC(O)R^3$, $-NHC(O)OR^3$, $-NR^4R^5$, $-C(O)NR^4R^5$, $-S(O)_2NR^4R^5$, $-CH_2NHC(O)OR^3$, $-CH_2NR^4R^5$ or $-S(O)_rR^3$; wherein the alkyl, alkenyl, alkynyl, cycloalkyl, heterocyclyl, aryl or heteroaryl is optionally further substituted with one or more substituents selected from a deuterium atom, halogen, nitro, cyano, alkyl, haloalkyl, cycloalkyl, heterocyclyl, aryl, heteroaryl, =O, $-OR^A$, $-C(O)R^6$, $-C(O)OR^6$, $-OC(O)R^6$, $-NR^7R^8$, $-C(O)NR^7R^8$, $-SO_2NR^7R^8$ or $-NR^7C(O)R^8$;

or, two R^2, together with the same carbon atom to which the groups are attached, form a -C(O) or cyclopropyl;

each R^3 is independently selected from a hydrogen atom, alkyl, cycloalkyl, heterocyclyl, aryl or heteroaryl, wherein the alkyl, cycloalkyl, heterocyclyl, aryl or heteroaryl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, nitro, cyano, alkyl, alkoxy, haloalkyl, haloalkoxy, cycloalkyl, heterocyclyl, aryl, heteroaryl, =O, $-C(O)R^6$, $-C(O)OR^6$, $-OC(O)R^6$, $-NR^7R^8$, $-C(O)NR^7R^8$, $-SO_2NR^7R^8$ or $-NR^7C(O)R^8$;

R^A is selected from a hydrogen atom, alkyl, cycloalkyl, heterocyclyl, aryl or heteroaryl, wherein the alkyl, cycloalkyl, heterocyclyl, aryl or heteroaryl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, nitro, cyano, alkyl, alkoxy, haloalkyl,

haloalkoxy, cycloalkyl, heterocyclyl, aryl, heteroaryl, =O, $-C(O)R^6$, $-C(O)OR^6$, $-OC(O)R^6$, $-NR^7R^8$, $-C(O)NR^7R^8$, $-SO_2NR^7R^8$ or $-NR^7C(O)R^8$;

R^4 and R^5 are each independently selected from a hydrogen atom, hydroxyl, alkyl, alkoxy, cycloalkyl, heterocyclyl, aryl or heteroaryl, wherein the alkyl, alkoxy, cycloalkyl, heterocyclyl, aryl or heteroaryl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, nitro, cyano, alkyl, alkoxy, cycloalkyl, heterocyclyl, aryl, heteroaryl, =O, $-C(O)R^6$, $-C(O)OR^6$, $-OC(O)R^6$, $-NR^7R^8$, $-C(O)NR^7R^8$, $-SO_2NR^7R^8$ or $-NR^7C(O)R^8$;

or, R^4 and R^5, together with atoms to which the groups are attached, form a 4-8 membered heterocyclyl, wherein the 4-8 membered heterocyclyl contains one or more N, O or $S(O)_r$, and the 4-8 membered heterocyclyl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, nitro, cyano, alkyl, alkoxy, cycloalkyl, heterocyclyl, aryl, heteroaryl, =O, $-C(O)R^6$, $-C(O)OR^6$, $-OC(O)R^6$, $-NR^7R^8$, $-C(O)NR^7R^8$, $-SO_2NR^7R^8$ or $-NR^7C(O)R^8$;

R^6, R^7 and R^8 are each independently selected from a hydrogen atom, alkyl, amino, cycloalkyl, heterocyclyl, aryl or heteroaryl, wherein the alkyl, cycloalkyl, heterocyclyl, aryl or heteroaryl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, nitro, amino, cyano, alkyl, alkoxy, cycloalkyl, heterocyclyl, aryl, heteroaryl, carboxyl or a carboxylate group;

t is selected from 0 or 1;

n is selected from 0, 1, 2, 3, 4, 5, 6, 7 or 8; and

each r is independently 0, 1 or 2；

preferably, wherein ring A is selected from a 12-18 membered tricyclic fused ring or 12-18 membered tricyclic heteroaryl, preferably a 12-16 membered tricyclic fused ring or 12-14 membered tricyclic heteroaryl; or

preferably, wherein X is selected from Cl or Br, preferably Cl; or

preferably, wherein R^1 is selected from methyl or ethyl.

2. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to claim 1, wherein R^2 is selected from a hydrogen atom, halogen, cyano, C_{1-6} alkyl, amino, SF_5, $-O(CH_2)_tR^A$, $-C(O)OR^3$, $-NHC(O)R^3$ or $-C(O)R^3$, wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from a deuterium atom, halogen, cyano, C_{1-6} alkyl, $-C(O)OR^6$ or $-OR^A$;

or, two R^2, together with the same carbon atom to which the groups are attached, form a -

C(O) or cyclopropyl;

R^A is selected from a hydrogen atom, C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{6-10} aryl, 5-6 membered heteroaryl or 5-6 membered heterocyclyl, wherein the C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{6-10} aryl, 5-6 membered heteroaryl or 5-6 membered heterocyclyl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, cyano, $-NR^7R^8$, C_{1-6} alkyl, C_{1-6} haloalkyl or C_{1-6} alkoxy;

R^3 is selected from a hydrogen atom, C_{3-8} cycloalkyl, C_{6-10} aryl or C_{1-6} alkyl, wherein the C_{3-8} cycloalkyl, C_{6-10} aryl or C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

R^6 is selected from a hydrogen atom or C_{1-6} alkyl;

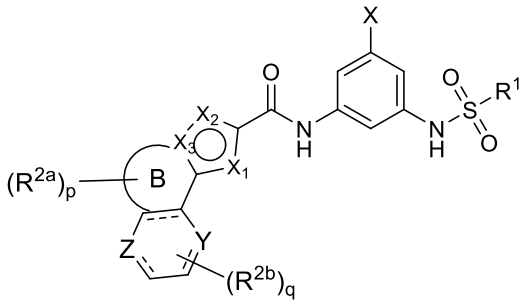
R^7 and R^8 are each independently selected from a hydrogen atom or C_{1-6} alkyl; and

t is selected from 0 or 1;

preferably, wherein R^2 is selected from a hydrogen atom, halogen, C_{1-6} alkyl, hydroxyl, cyano, C_{1-6} alkoxy, SF_5, C_{1-6} haloalkyl or C_{1-6} haloalkoxy;

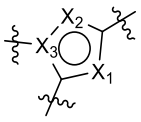
or, two R^2, together with the same carbon atom to which the groups are attached, form a -C(O) group.

3. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to claim 1 or 2, which is a compound as shown in formula (IIA), or a stereoisomer thereof, a tautomer thereof or a pharmaceutically acceptable salt thereof:



(IIA)

wherein:



is 5-membered heteroaryl;

X_1 and X_2 are each independently selected from CH, S or N, and X_1 and X_2 are not S at the

same time;

X_3 is selected from C or N; provided that when X_3 is C, X_1 and X_2 are not CH at the same time;

ring B is selected from 5-8 membered heterocyclyl, 6-10 membered aryl or 5-6 membered heteroaryl, wherein the heterocyclyl contains 1 or 2 double bonds;

$\equiv$ is selected from a single bond or a double bond as required, so that each atom thereof is present in a normal valence state;

Y and Z are each independently selected from CR^a, CHR^a, O, N or NR^b;

R^{2a} is selected from a hydrogen atom, C_{3-8} cycloalkyl, C_{1-6} alkyl or $-C(O)R^3$, wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from a deuterium atom, halogen, hydroxyl, cyano, C_{1-6} alkyl, C_{1-6} alkoxy or $-C(O)OR^6$;

or, two R^{2a}, together with the same carbon atom to which the groups are attached, form a -C(O) or cyclopropyl;

each R^{2b} is independently selected from a hydrogen atom, C_{1-6} alkyl, C_{1-6} alkoxy or $-C(O)OR^3$; wherein the C_{1-6} alkyl or C_{1-6} alkoxy is optionally further substituted with one or more substituents selected from hydroxyl, halogen or cyano;

R^a and R^b are each independently selected from a hydrogen atom, halogen, cyano, C_{1-6} alkyl, amino, $-NHC(O)R^3$ or $-O(CH_2)_tR^A$, wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, cyano, C_{1-6} alkyl or $-OR^A$;

each R^A is independently selected from a hydrogen atom, C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{6-10} aryl, 5-6 membered heteroaryl or 5-6 membered heterocyclyl, wherein the C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{6-10} aryl, 5-6 membered heteroaryl or 5-6 membered heterocyclyl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, cyano, $-NR^7R^8$, C_{1-6} alkyl, C_{1-6} haloalkyl or C_{1-6} alkoxy;

R^3 is selected from a hydrogen atom, C_{6-10} aryl, C_{3-8} cycloalkyl or C_{1-6} alkyl, wherein the C_{6-10} aryl, C_{3-8} cycloalkyl or C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

R^6 is selected from a hydrogen atom or C_{1-6} alkyl;

R^7 and R^8 are each independently selected from a hydrogen atom or C_{1-6} alkyl;

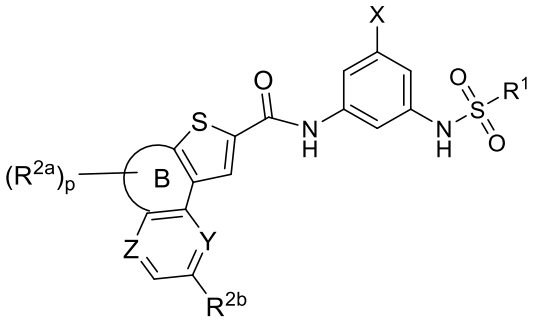
t is selected from 0 or 1;

each p is independently selected from 0, 1, 2, 3, 4 or 5;

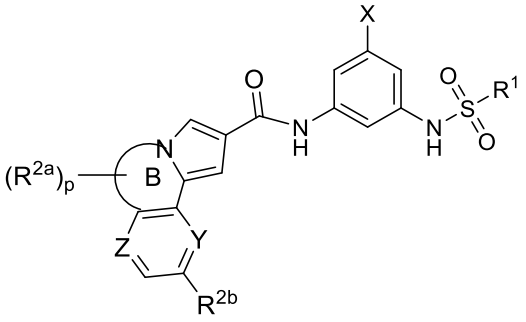
each q is independently selected from 0, 1 or 2; and

R^1 and X are as defined in claim 1.

4. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to claim 3, which is a compound as shown in formula (IIIA) or (IIIB), or a stereoisomer thereof, a tautomer thereof or a pharmaceutically acceptable salt thereof:



(IIIA)



(IIIB)

wherein:

ring B is selected from 5-8 membered heterocyclyl, wherein the heterocyclyl contains 1 or 2 double bonds;

Y and Z are each independently selected from CR^a or N;

R^{2a} is selected from a hydrogen atom, C_{1-6} alkyl or $-C(O)R^3$; wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6}alkyl, C_{1-6} alkoxy or $-C(O)OR^6$;

or, two R^{2a}, together with the same carbon atom to which the groups are attached, form a -C(O) or cyclopropyl;

each R^{2b} is independently selected from a hydrogen atom, C_{1-6} alkyl, C_{1-6} alkoxy or $-C(O)OR^3$;

each R^a is independently selected from a hydrogen atom, halogen, cyano, C_{1-6} alkyl, amino, $-NHC(O)R^3$ or $-O(CH_2)_tR^A$; wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, cyano, C_{1-6} alkyl or $-OR^A$;

each R^A is independently selected from a hydrogen atom, C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{6-10} aryl, 5-6 membered heteroaryl or 5-6 membered heterocyclyl, wherein the C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{6-10} aryl, 5-6 membered heteroaryl or 5-6 membered heterocyclyl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, cyano, $-NR^7R^8$, C_{1-6} alkyl, C_{1-6} haloalkyl or C_{1-6} alkoxy;

R^3 is selected from a hydrogen atom, C_{6-10} aryl or C_{1-6} alkyl, wherein the C_{6-10} aryl or C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen,

hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

R^6 is selected from a hydrogen atom or C_{1-6} alkyl;

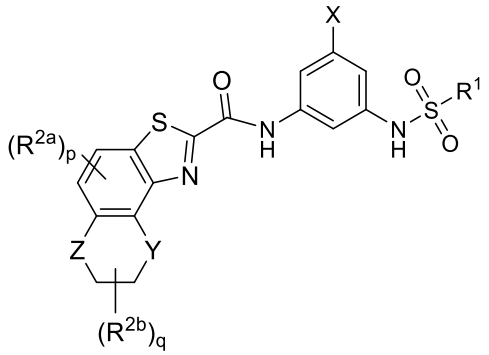
R^7 and R^8 are each independently selected from a hydrogen atom or C_{1-6} alkyl;

t is selected from 0 or 1;

each p is independently selected from 0, 1, 2, 3, 4 or 5; and

R^1 and X are as defined in claim 3.

5. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to claim 3, which is a compound as shown in formula (IIIC), or a stereoisomer thereof, a tautomer thereof or a pharmaceutically acceptable salt thereof:



(IIIC)

wherein:

Y and Z are each independently selected from CHR^a, O or NR^b;

R^{2a} is selected from a hydrogen atom or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

each R^{2b} is independently selected from a hydrogen atom or C_{1-6} alkyl;

R^a and R^b are each independently selected from a hydrogen atom, halogen, hydroxyl, cyano or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

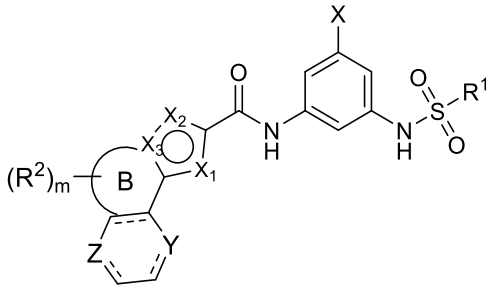
each p is independently selected from 0, 1 or 2;

each q is independently selected from 0, 1 or 2; and

R^1 and X are as defined in claim 3.

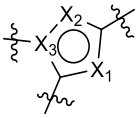
6. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to claim 1 or 2, which is a compound as shown in formula (II),

or a stereoisomer thereof, a tautomer thereof or a pharmaceutically acceptable salt thereof:



(II)

wherein:

 is 5-membered heteroaryl;

X_1 and X_2 are each independently selected from CH, S or N, and X_1 and X_2 are not S at the same time;

X_3 is selected from C or N; provided that when X_3 is C, X_1 and X_2 are not CH at the same time;

ring B is selected from 5-8 membered heterocyclyl, 6-10 membered aryl or 5-6 membered heteroaryl, wherein the heterocyclyl contains 1 or 2 double bonds;

 is 6-membered heteroaryl or 6-membered heterocyclyl;

 is selected from a single bond or a double bond as required, so that each atom thereof is present in a normal valence state;

Y and Z are each independently selected from CR^a, O or NR^b;

R^a is selected from a hydrogen atom, halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy, wherein the alkyl or alkoxy is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

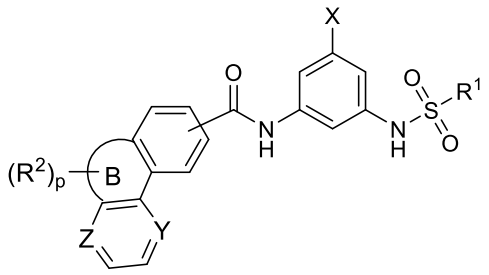
R^b is selected from a hydrogen atom or C_{1-6} alkyl, wherein the alkyl is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

m is selected from 0, 1, 2 or 3; and

R^1, R^2 and X are as defined in claim 1.

7. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically

acceptable salt thereof according to claim 1 or 2, which is a compound as shown in formula (III), or a stereoisomer thereof, a tautomer thereof or a pharmaceutically acceptable salt thereof:



(III)

wherein:

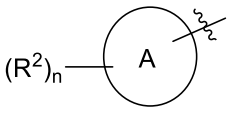
ring B is selected from 5-8 membered heterocyclyl or 5-6 membered heteroaryl, wherein the heterocyclyl contains 1 or 2 double bonds;

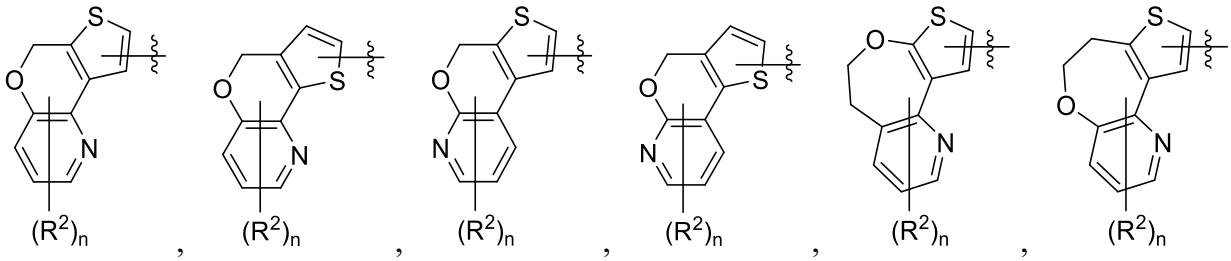
Y and Z are each independently selected from CR^a or N;

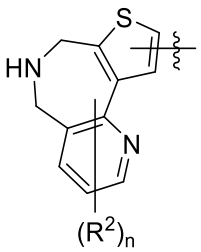
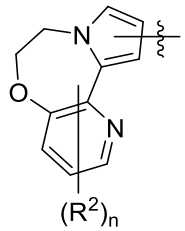
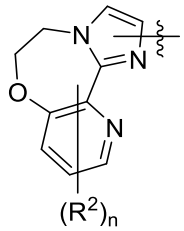
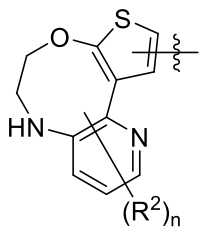
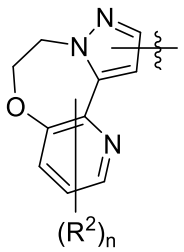
R^a is selected from a hydrogen atom, halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy, wherein the C_{1-6} alkyl or C_{1-6} alkoxy is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

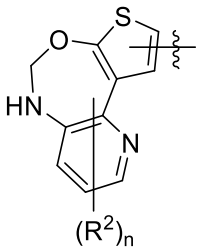
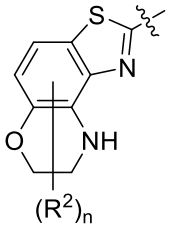
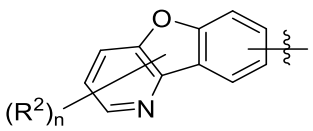
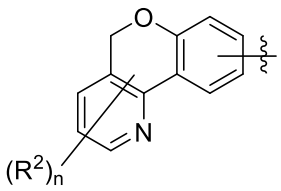
p is selected from 0, 1, 2 or 3; and

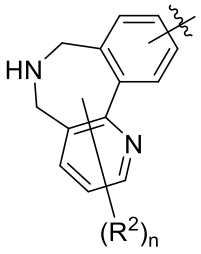
R^1, R^2 and X are as defined in claim 1.

8. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to claim 1 or 2, wherein  is selected from the following groups:

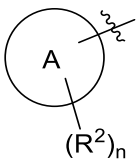
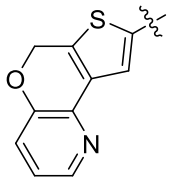


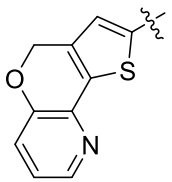
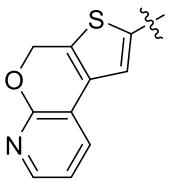
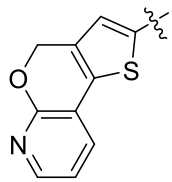
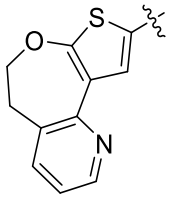
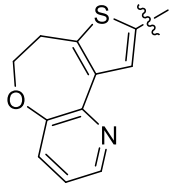
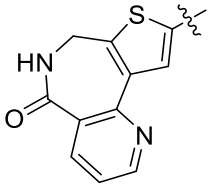
 ,  ,  ,  ,  ,

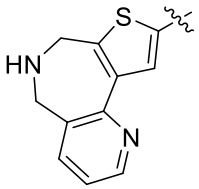
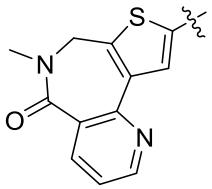
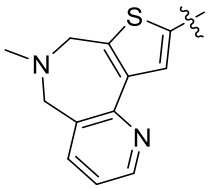
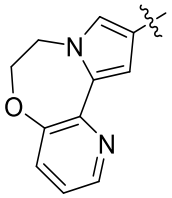
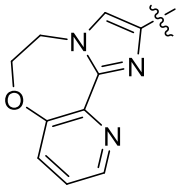
 ,  ,  ,  or

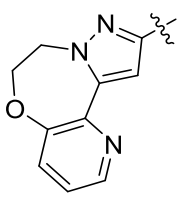
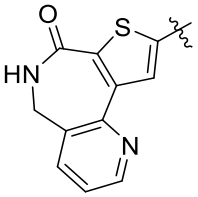
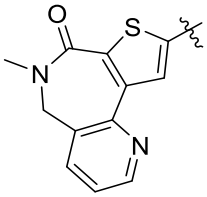
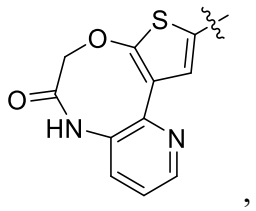
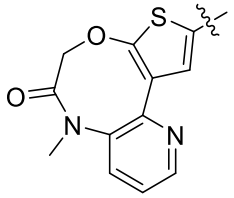
 ; and

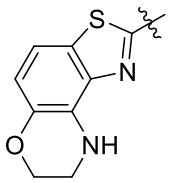
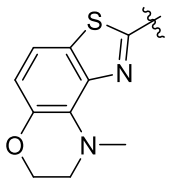
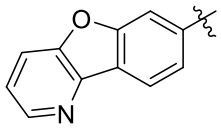
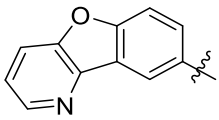
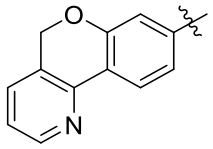
R^2 and n are as defined in claim 1;

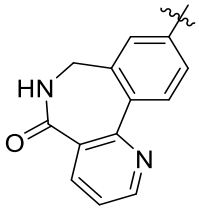
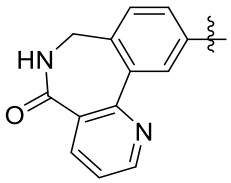
preferably, wherein  is selected from the following groups:  ,

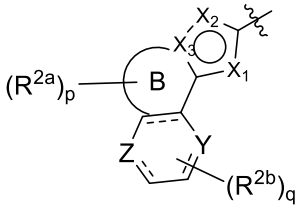
 ,  ,  ,  ,  ,  ,

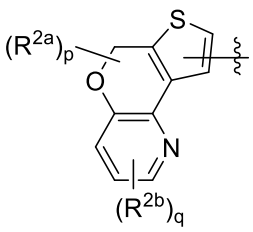
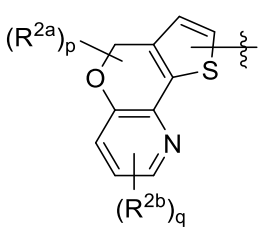
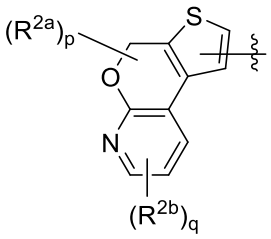
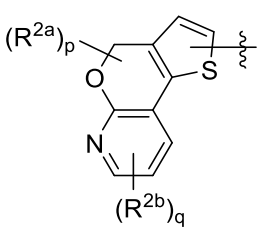
 ,  ,  ,  ,  ,

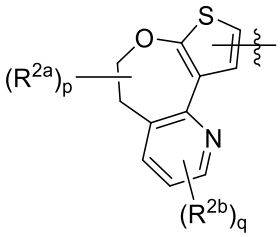
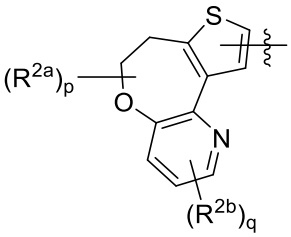
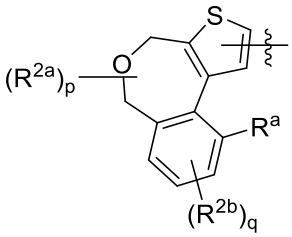
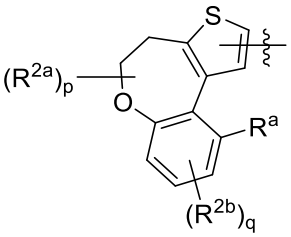
 ,  ,  ,  ,  ,

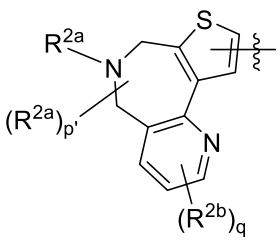
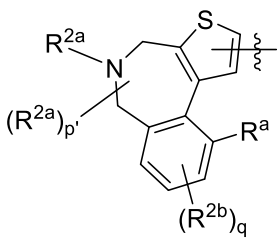
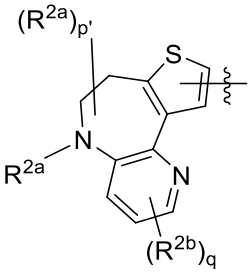
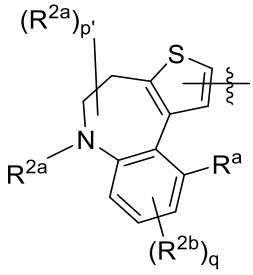
 ,  ,  ,  ,  ,

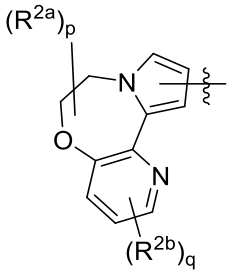
 or  .

9. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to claim 3, wherein  is selected from the following groups:

 ,  ,  ,  ,

 ,  ,  ,  ,

 ,  ,  ,  ,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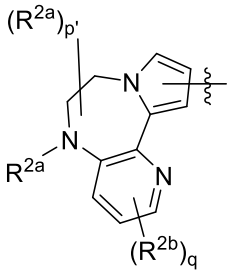
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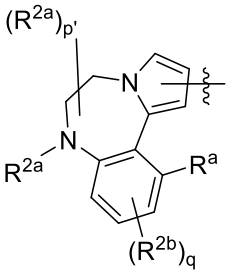
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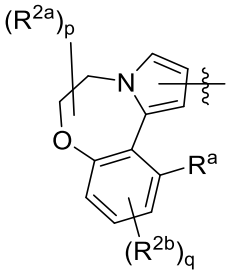
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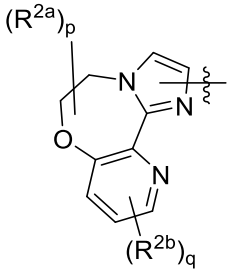
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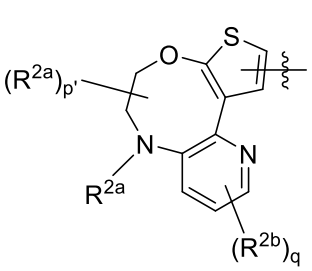
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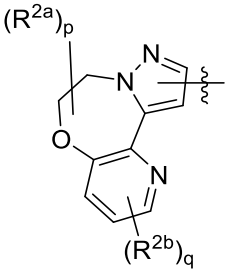
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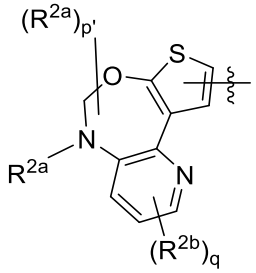
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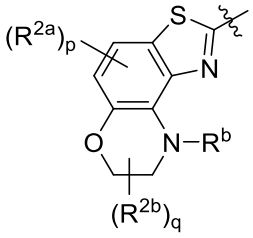

;

R^{2a} is selected from a hydrogen atom, C_{1-6} alkyl, C_{3-8} cycloalkyl or $-C(O)R^3$, wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from a deuterium atom, halogen, hydroxyl, cyano, C_{1-6} alkyl, C_{1-6} alkoxy or $-C(O)OR^6$;

or, two R^{2a}, together with the same carbon atom to which the groups are attached, form a -C(O) or cyclopropyl;

each R^{2b} is independently selected from a hydrogen atom, C_{1-6} alkyl, C_{1-6} alkoxy or $-C(O)OR^3$;

each R^a is independently selected from a hydrogen atom, halogen, cyano, C_{1-6} alkyl, amino, $-NHC(O)R^3$ or $-O(CH_2)_tR^A$, wherein the C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, cyano, C_{1-6} alkyl or $-OR^A$;

R^b is selected from a hydrogen atom or C_{1-6} alkyl, wherein the C_{1-6} alkyl is optionally further substituted with one or more halogens;

R^A is selected from a hydrogen atom, C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{6-10} aryl, 5-6 membered heteroaryl or 5-6 membered heterocyclyl, wherein the C_{1-6} alkyl, C_{3-8} cycloalkyl, C_{6-10} aryl, 5-6 membered heteroaryl or 5-6 membered heterocyclyl is optionally further substituted with one or more substituents selected from hydroxyl, halogen, cyano, $-NR^7R^8$, C_{1-6} alkyl, C_{1-6} haloalkyl or C_{1-6} alkoxy;

R^3 is selected from a hydrogen atom, C_{6-10} aryl, C_{3-8} cycloalkyl or C_{1-6} alkyl, wherein the C_{6-10} aryl, C_{3-8} cycloalkyl or C_{1-6} alkyl is optionally further substituted with one or more substituents selected from halogen, hydroxyl, cyano, C_{1-6} alkyl or C_{1-6} alkoxy;

R^6 is selected from a hydrogen atom or C_{1-6} alkyl;

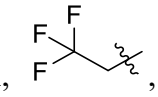
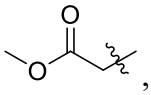
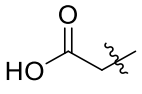
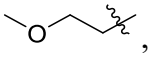
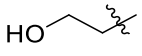
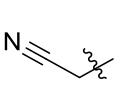
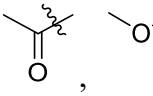
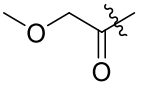
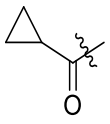
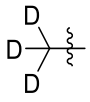
R^7 and R^8 are each independently selected from a hydrogen atom or C_{1-6} alkyl;

t is selected from 0 or 1;

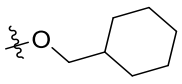
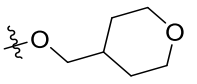
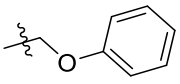
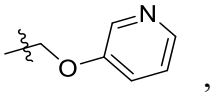
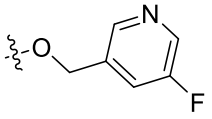
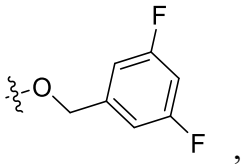
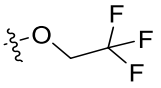
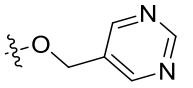
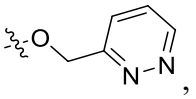
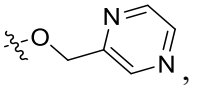
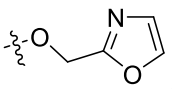
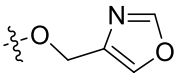
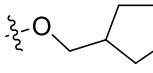
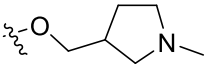
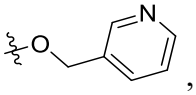
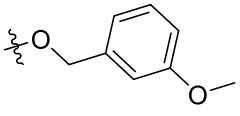
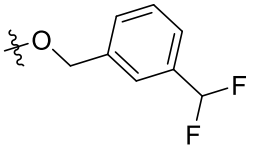
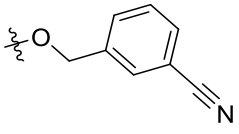
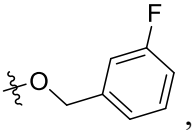
each p is independently selected from 0, 1, 2, 3, 4 or 5;

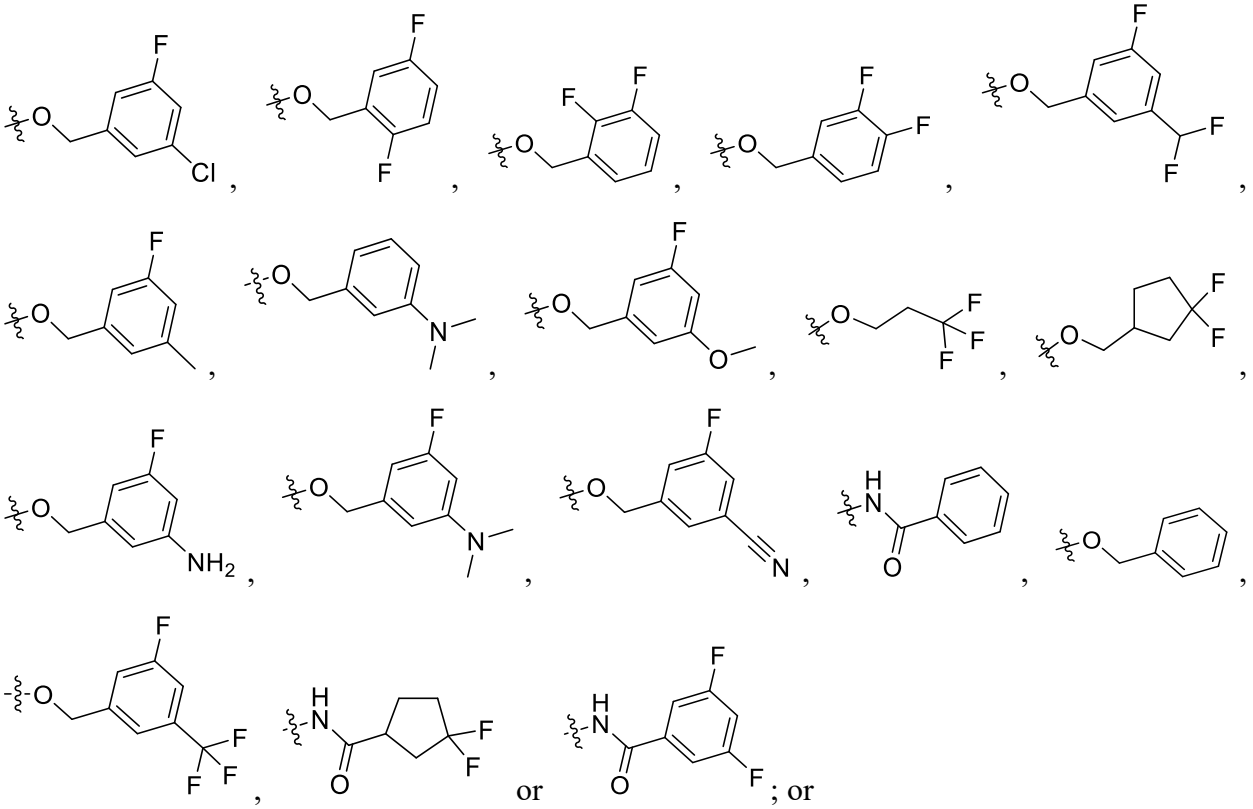
each p' is independently selected from 0, 1, 2, 3 or 4; and

each q is independently selected from 0, 1 or 2;

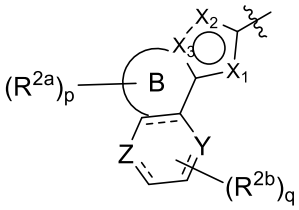
preferably, wherein R^{2a} is selected from a hydrogen atom, methyl, ethyl, isopropyl,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  or  ;

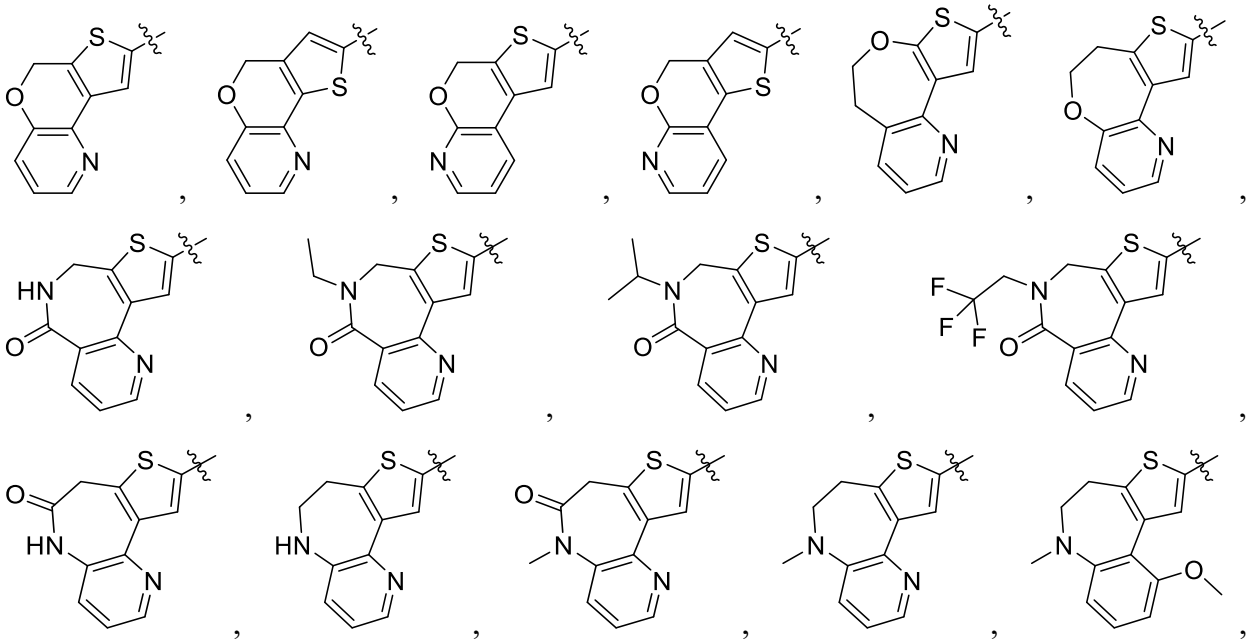
or, two R^{2a}, together with the same carbon atom to which the groups are attached, form a -C(O) or cyclopropyl; or

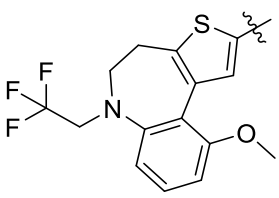
preferably, wherein R^a is selected from a hydrogen atom, hydroxyl, cyano, methyl, methoxy, trifluoromethyl, trifluoromethoxy, amino,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  .



preferably, wherein q is 0;

more preferably, wherein  is selected from the following groups:

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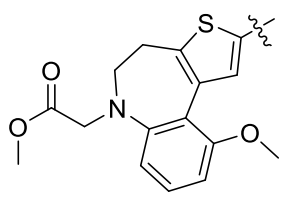
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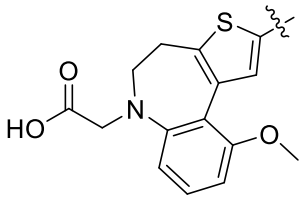
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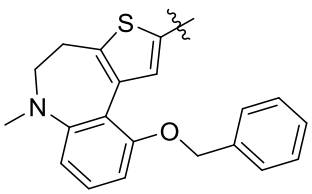
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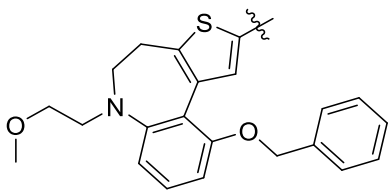
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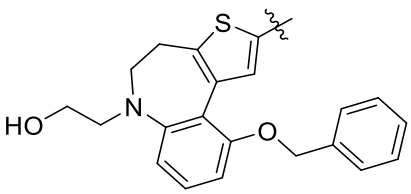
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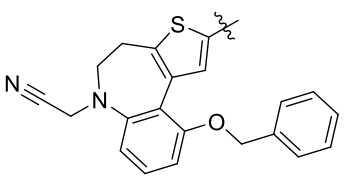
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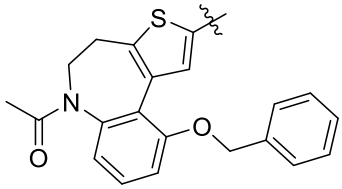
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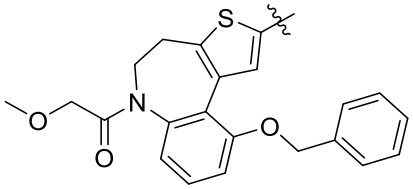
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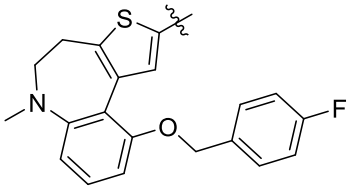
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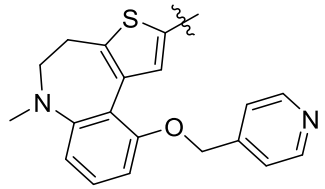
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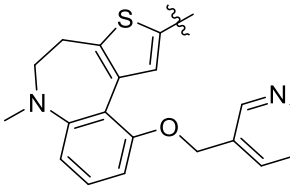
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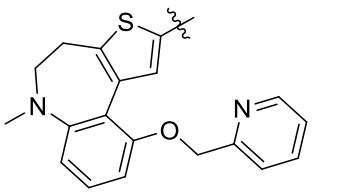
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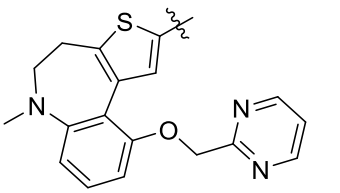
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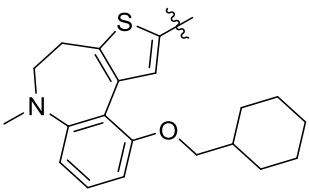
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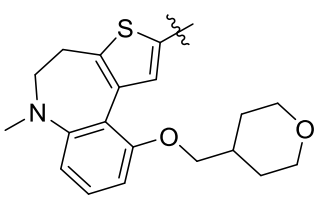
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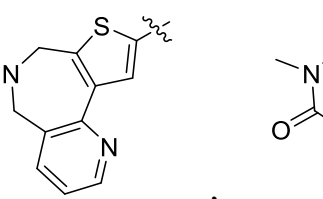
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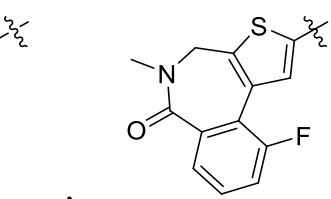
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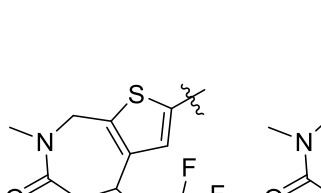
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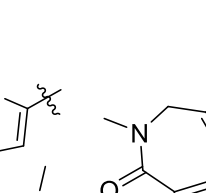
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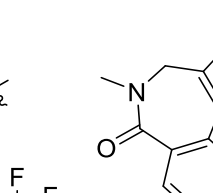
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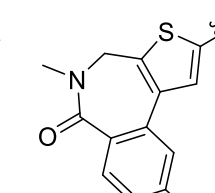
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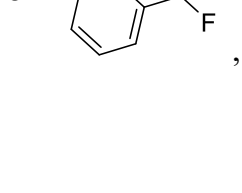
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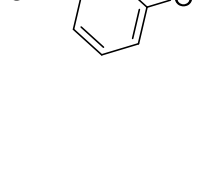
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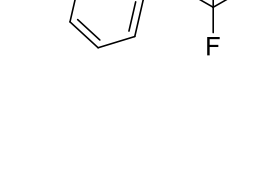
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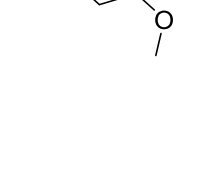
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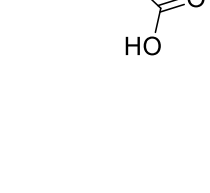
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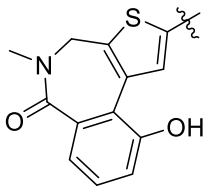
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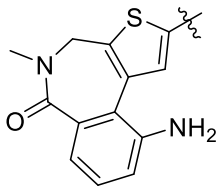
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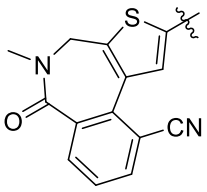
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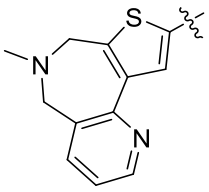
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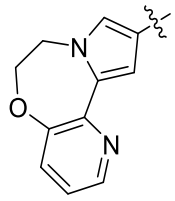
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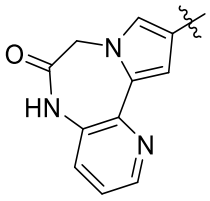
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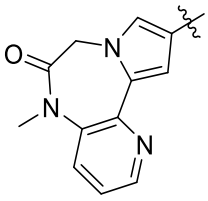
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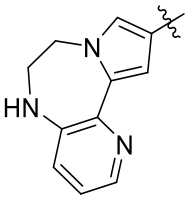
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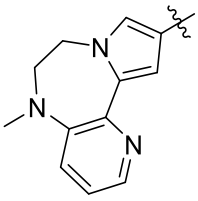
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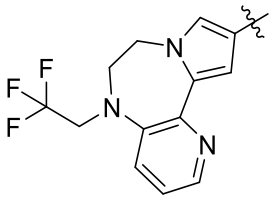
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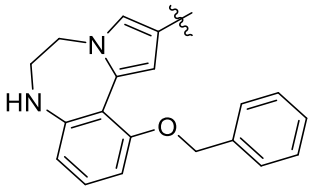
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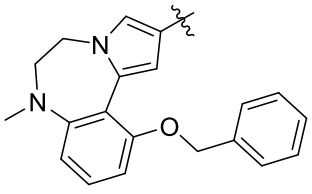
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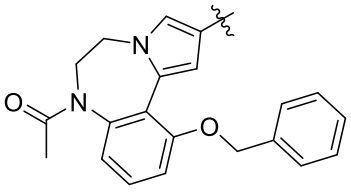
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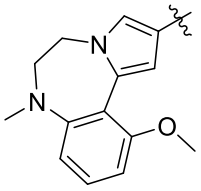
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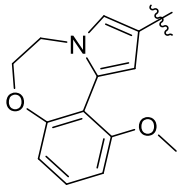
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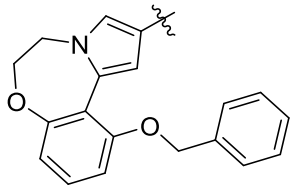
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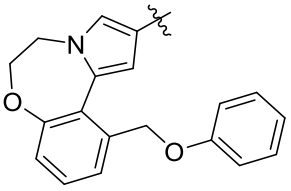
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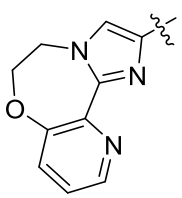
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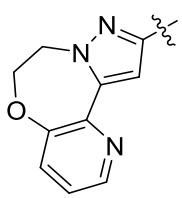
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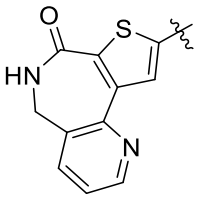
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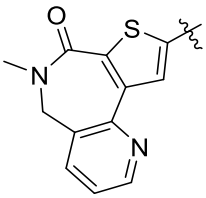
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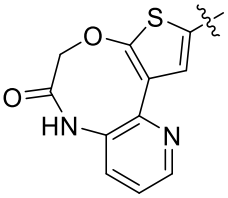
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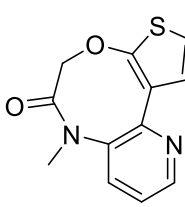
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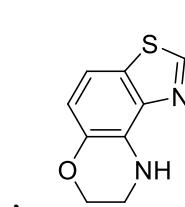
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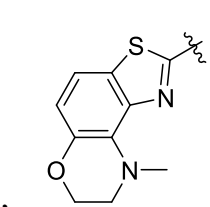
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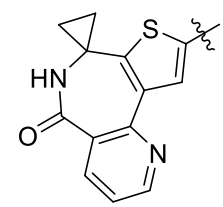
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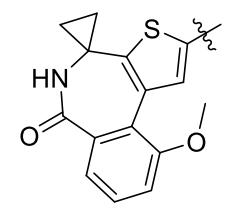
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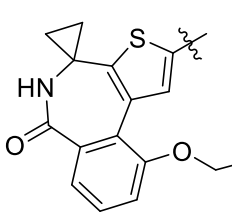
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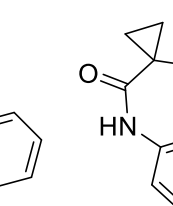
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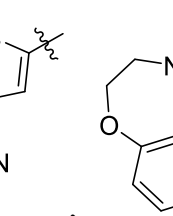
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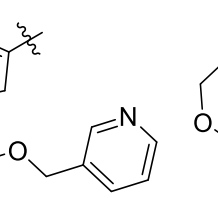
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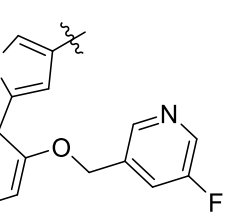
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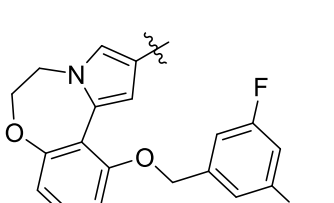
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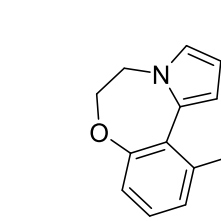
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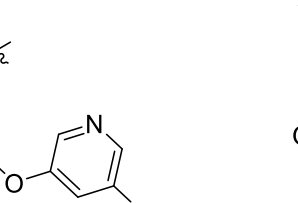
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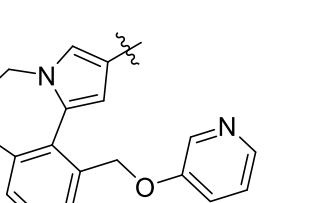
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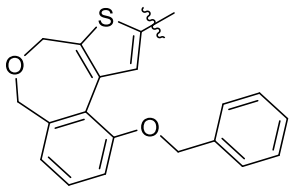
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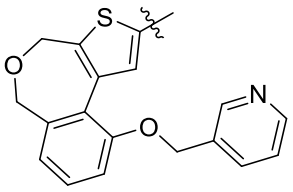
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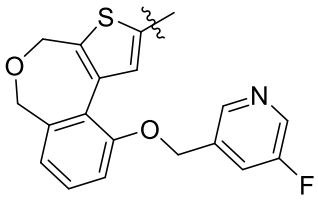
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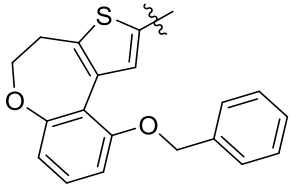
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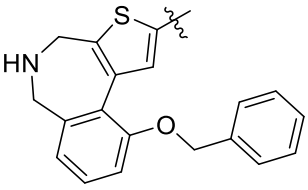
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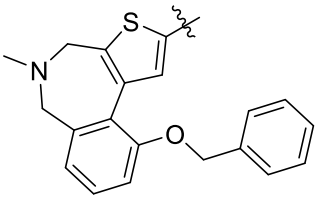
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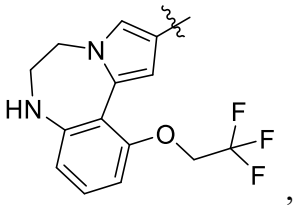
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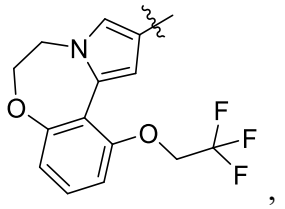
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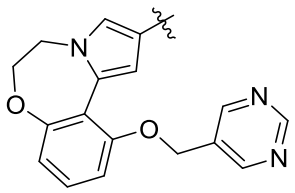
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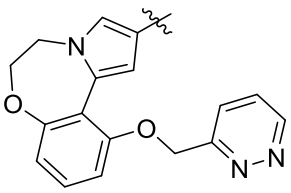
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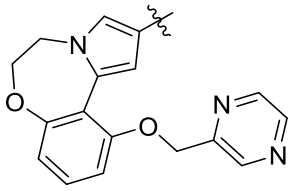
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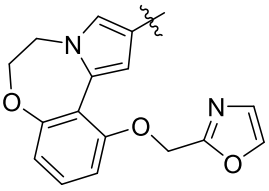
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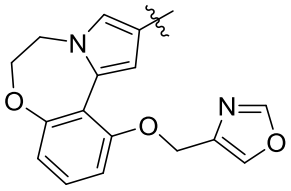
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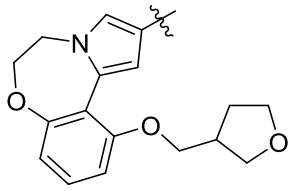
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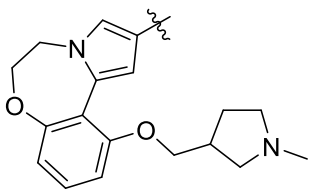
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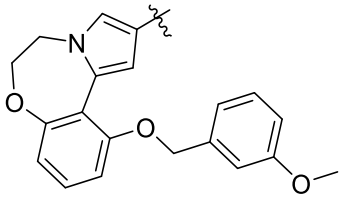
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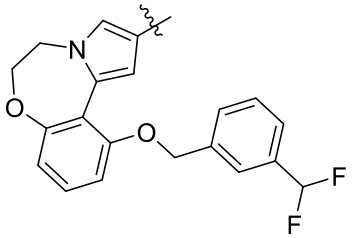
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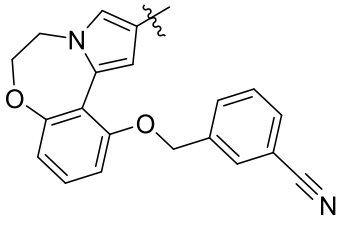
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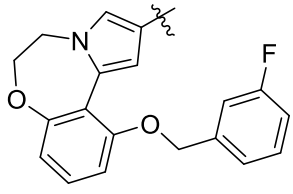
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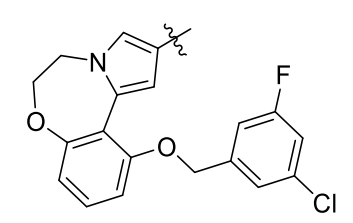
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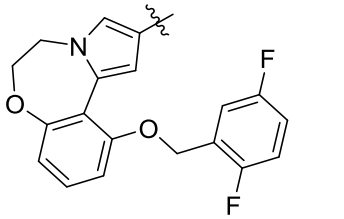
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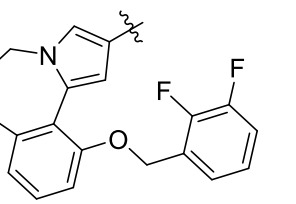
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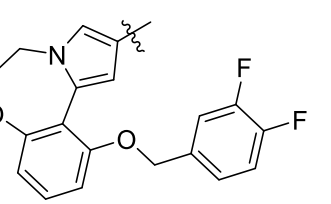
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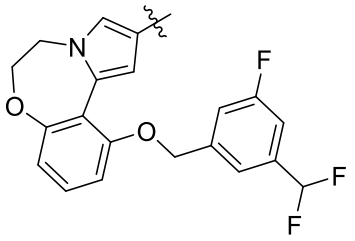
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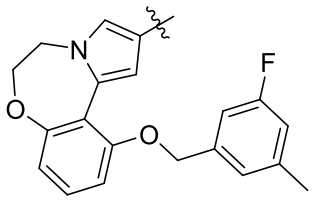
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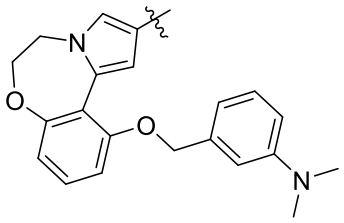
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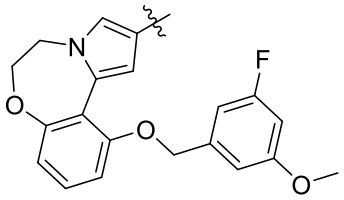
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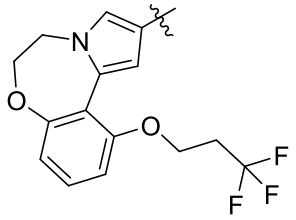
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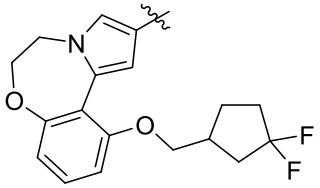
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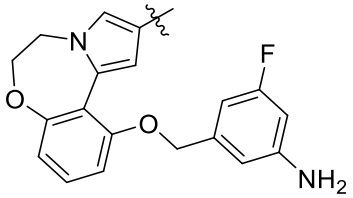
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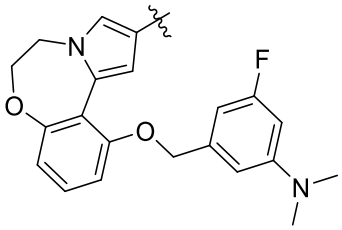
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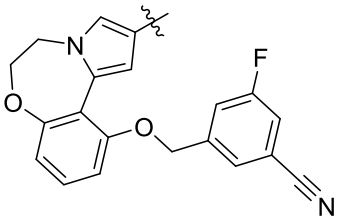
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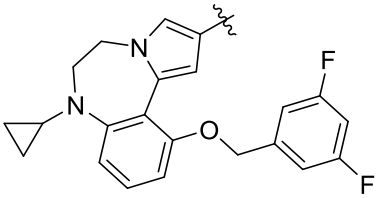
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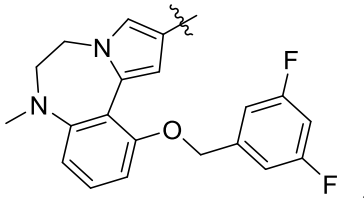
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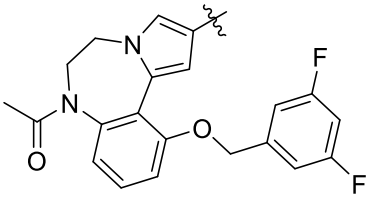
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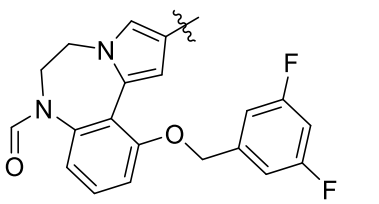
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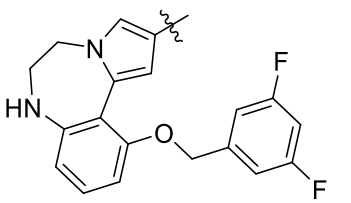
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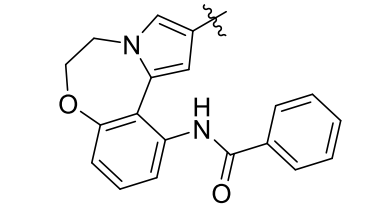
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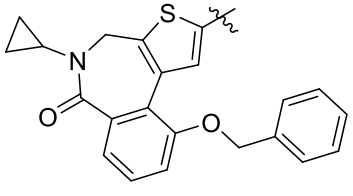
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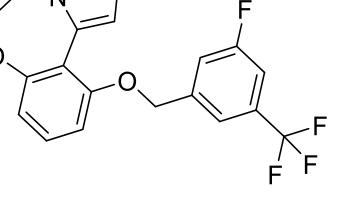
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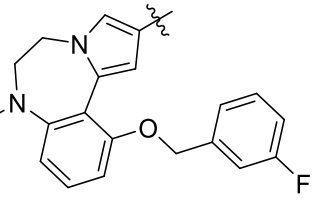
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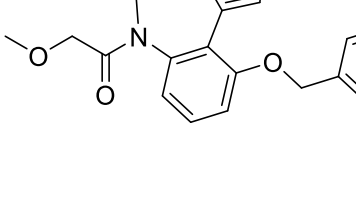
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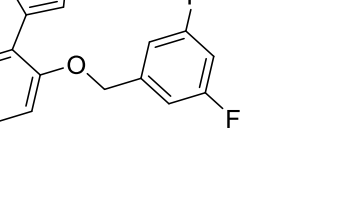
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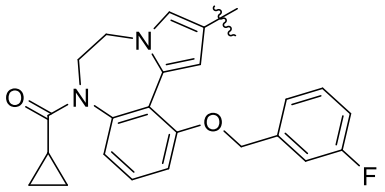
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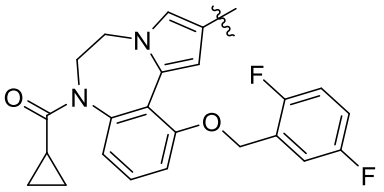
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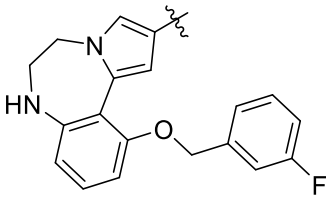
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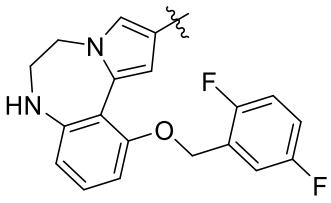
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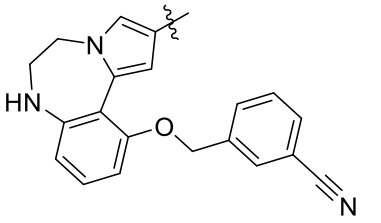
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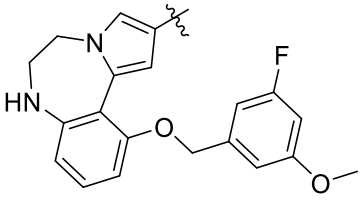
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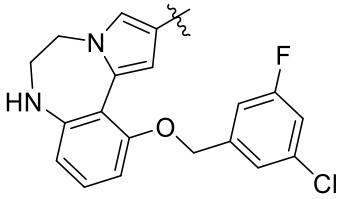
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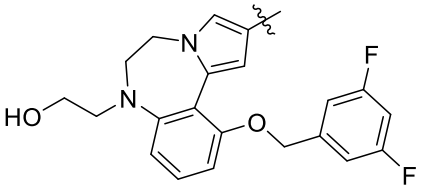
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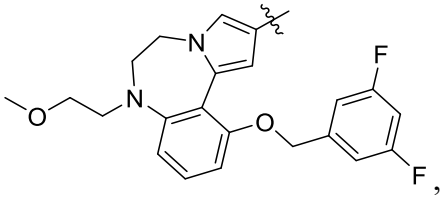
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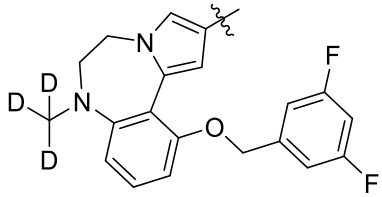
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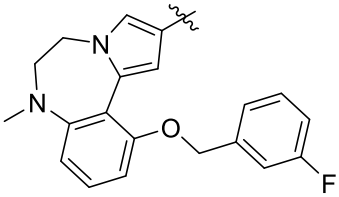
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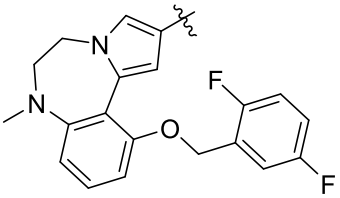
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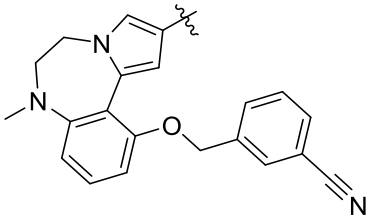
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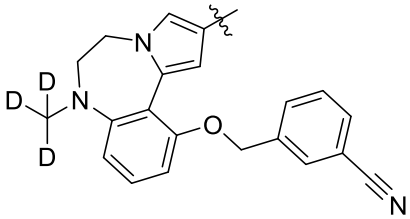
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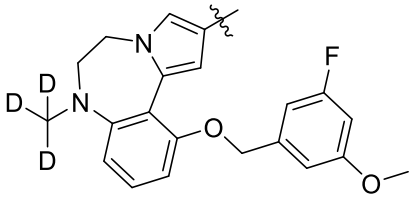
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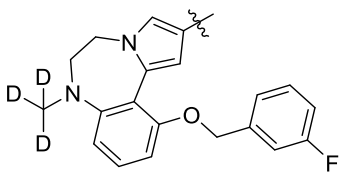
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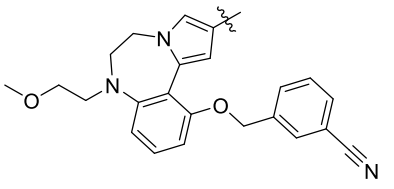
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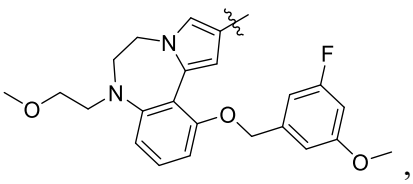
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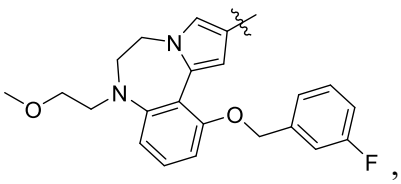
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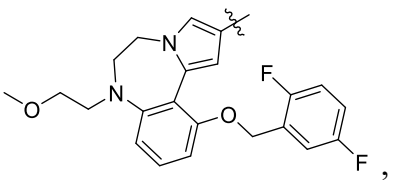
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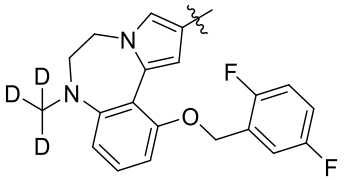
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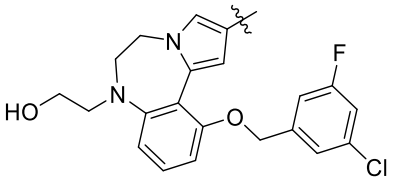
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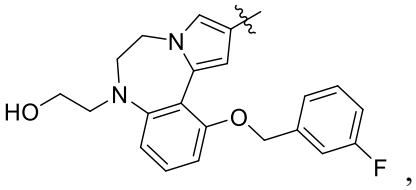
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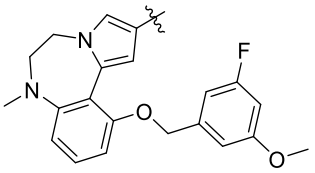
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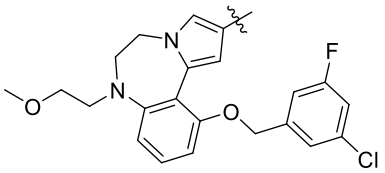
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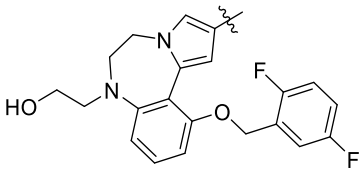
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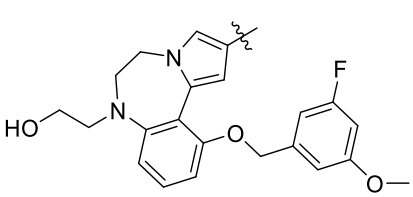
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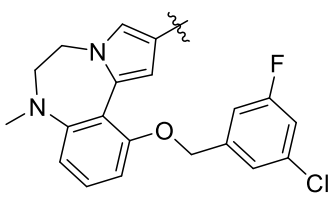
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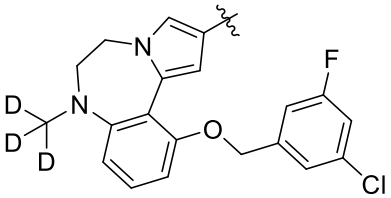
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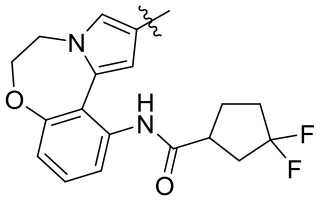
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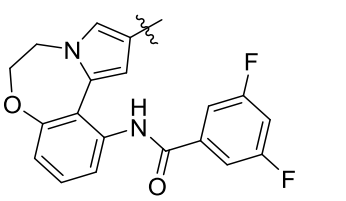
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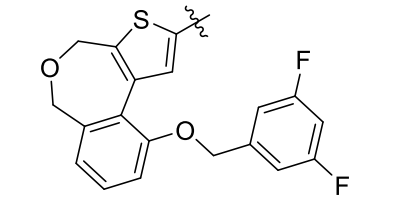
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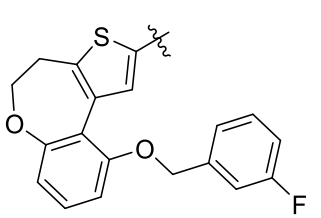
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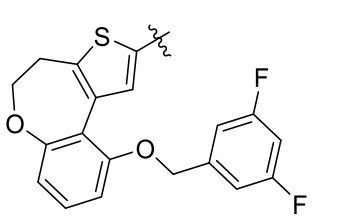
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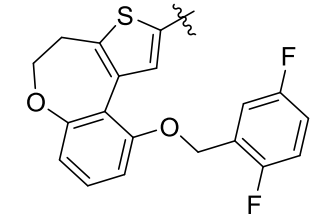
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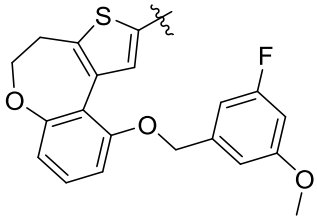
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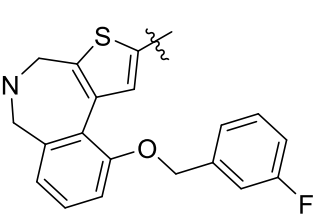
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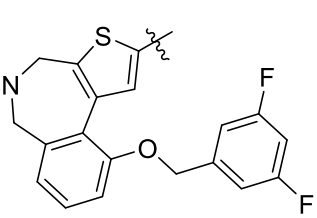
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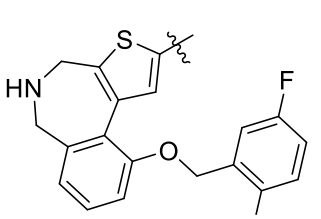
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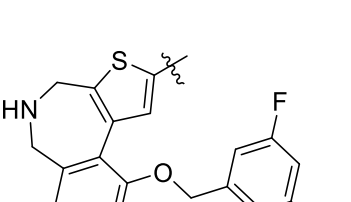
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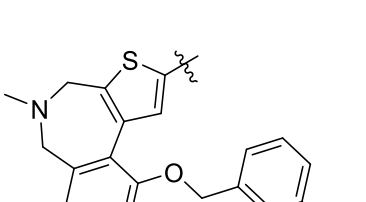
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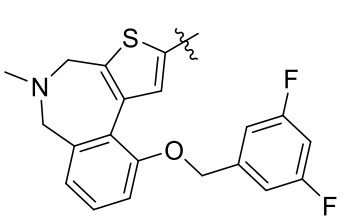
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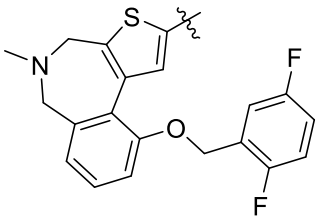
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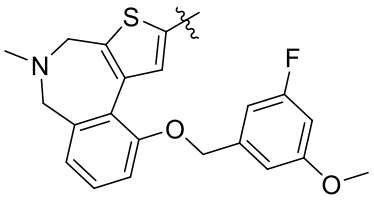
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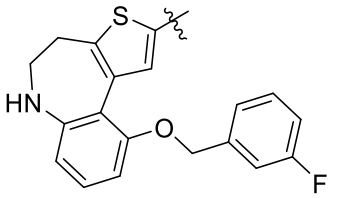
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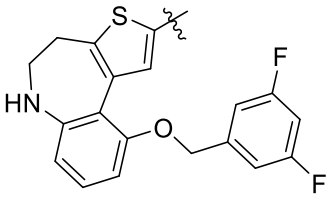
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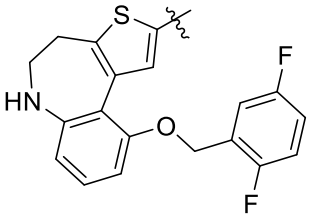
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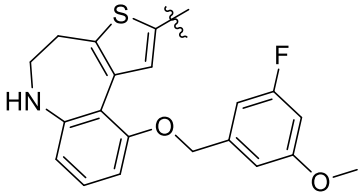
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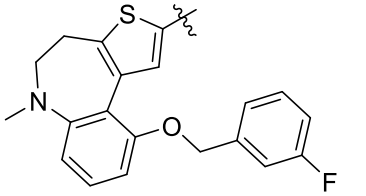
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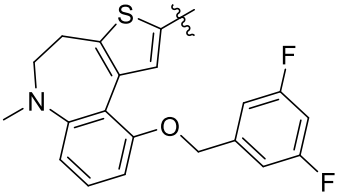
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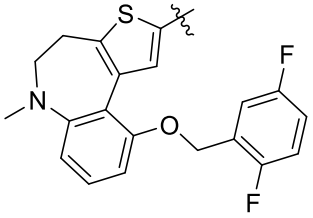
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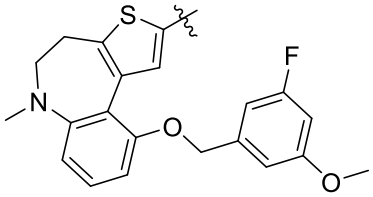
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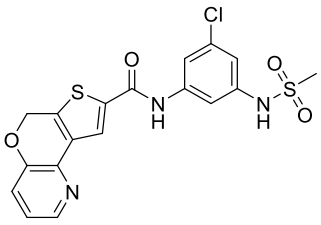
10. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 9, wherein the compound is: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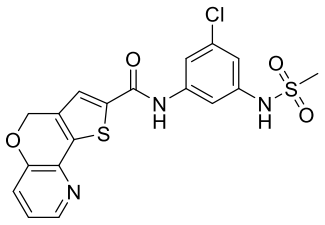
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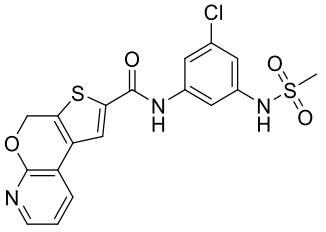
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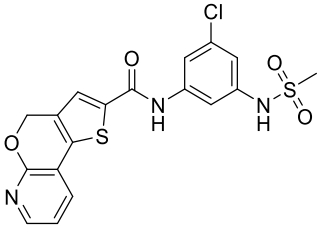
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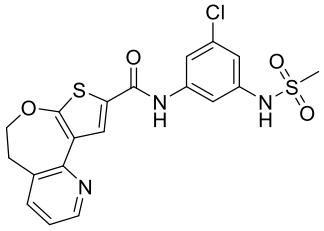
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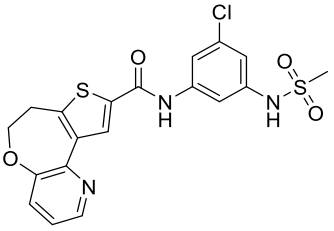
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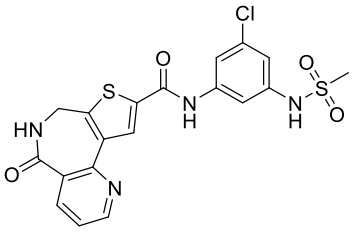
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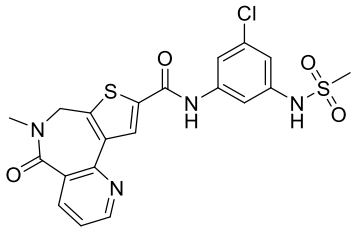
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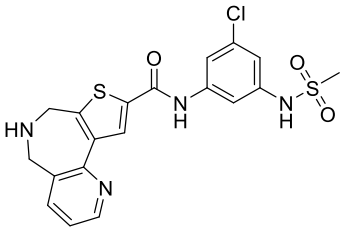
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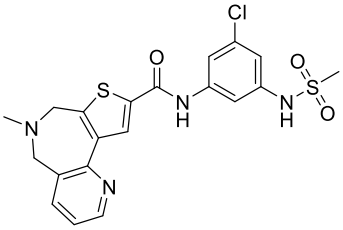
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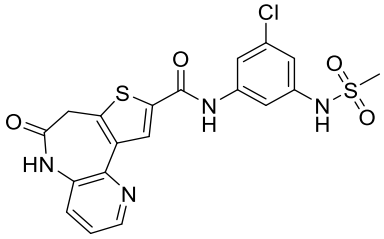
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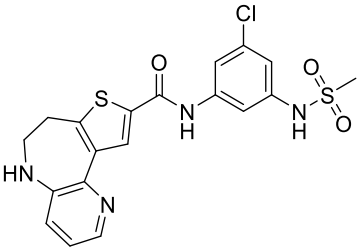
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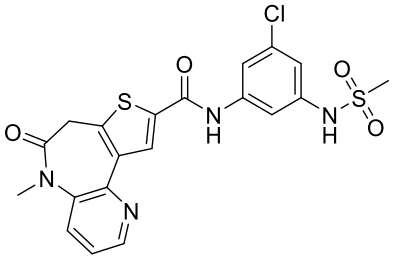
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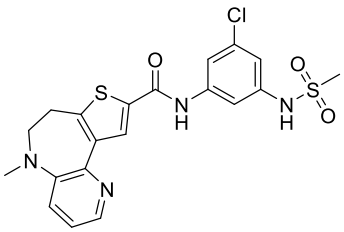
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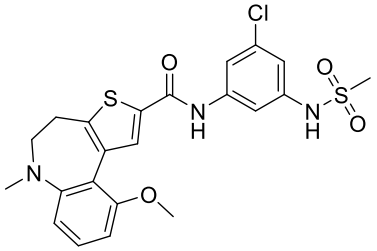
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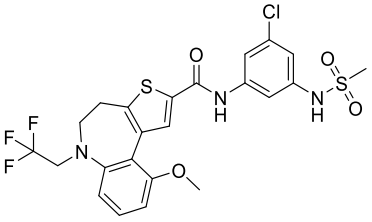
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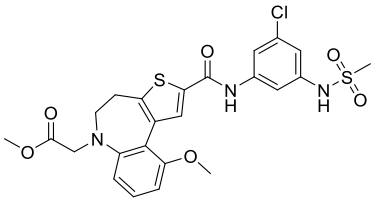
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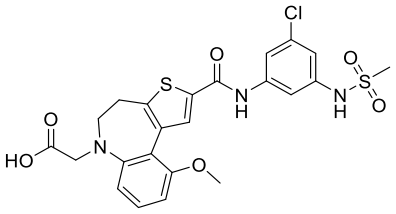
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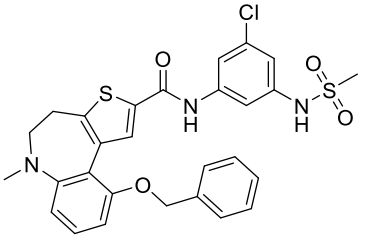
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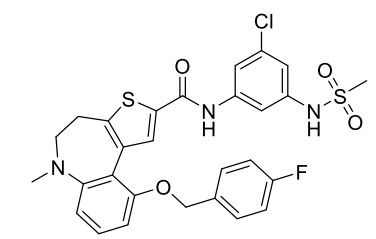
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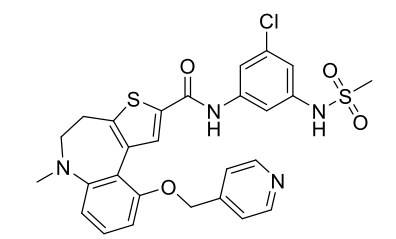
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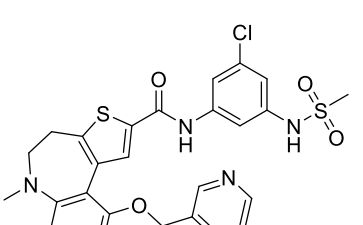
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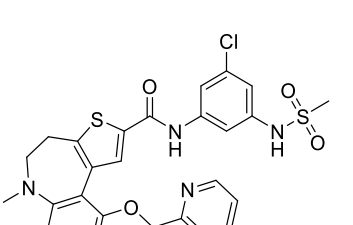
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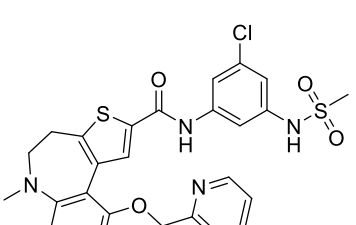
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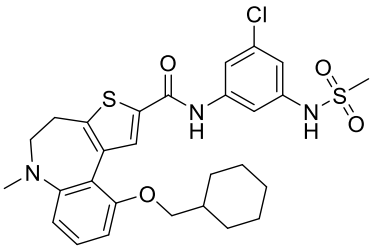
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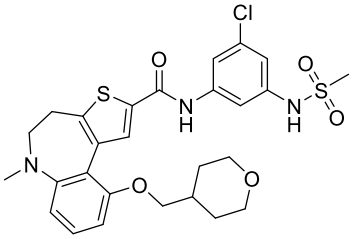
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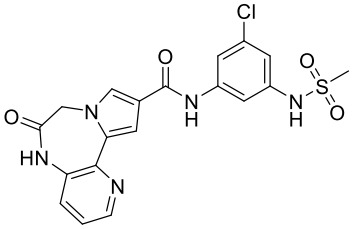
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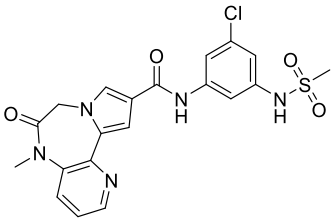
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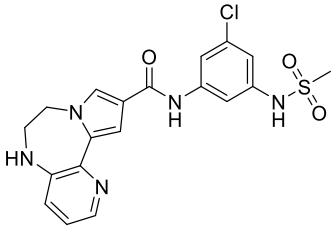
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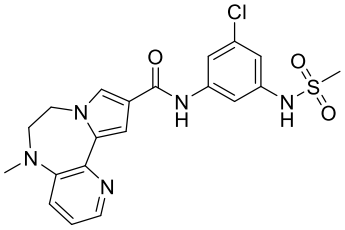
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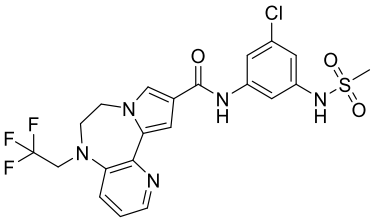
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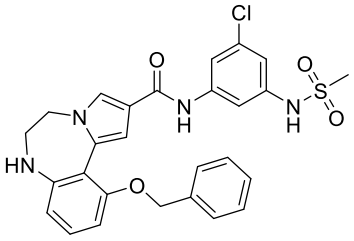
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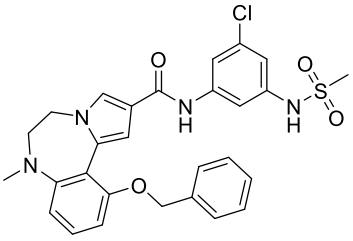
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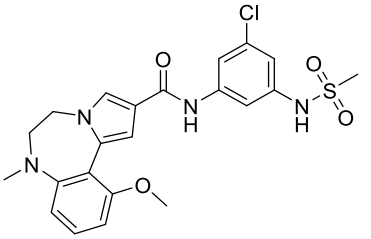
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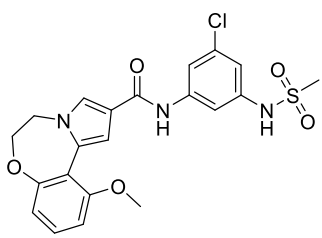
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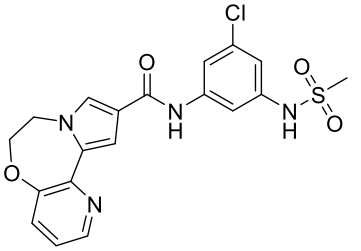
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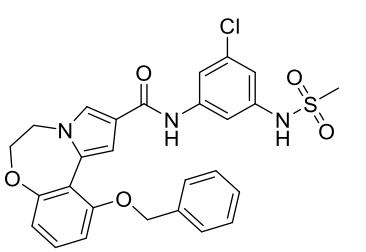
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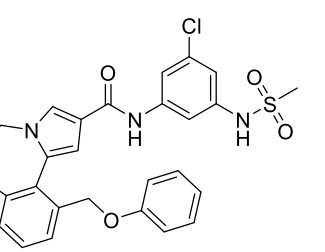
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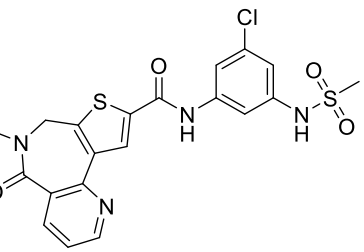
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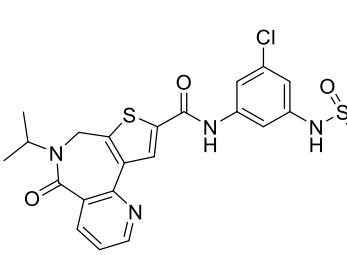
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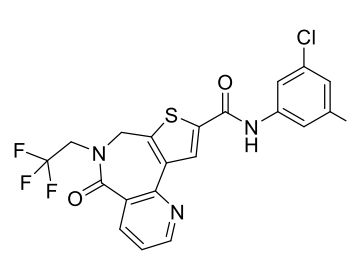
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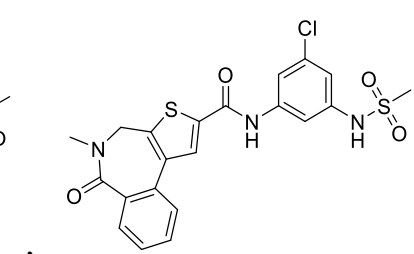
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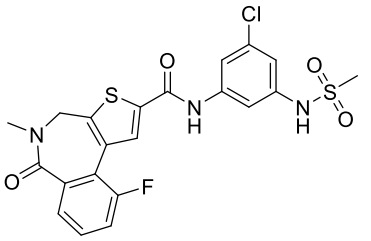
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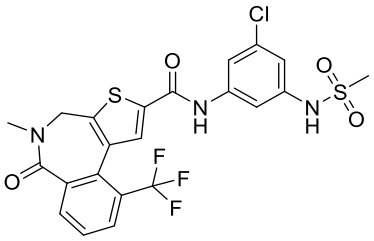
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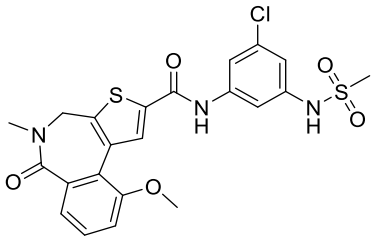
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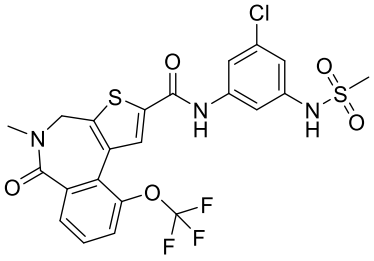
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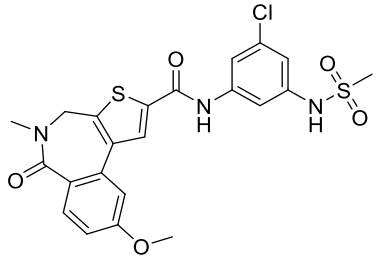
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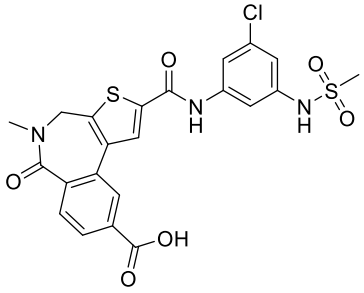
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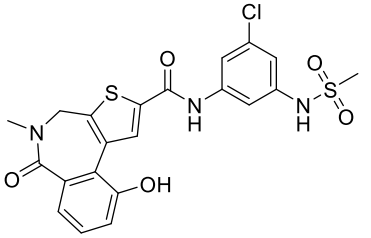
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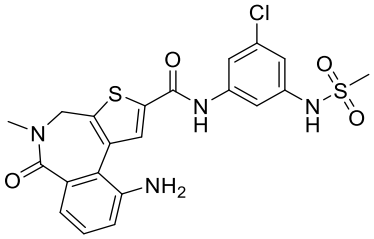
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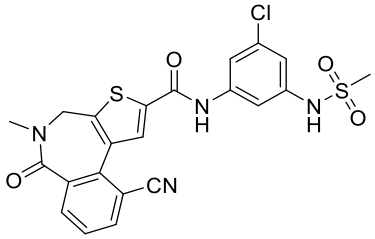
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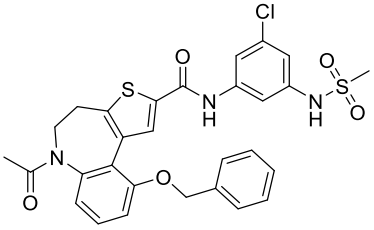
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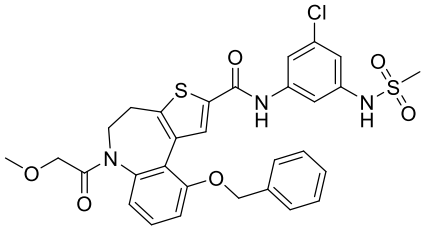
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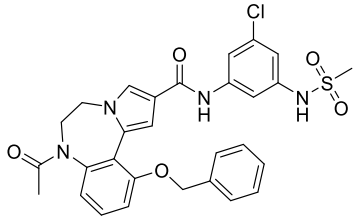
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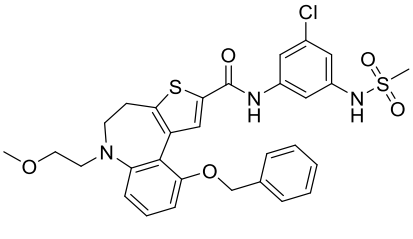
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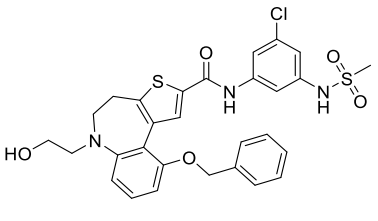
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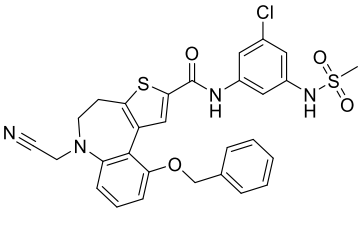
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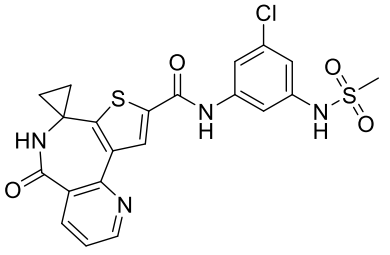
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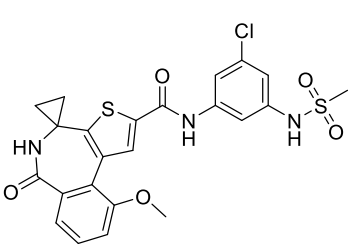
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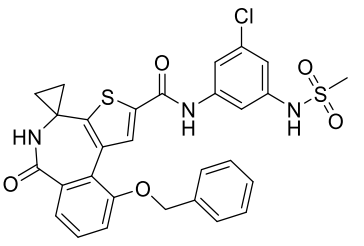
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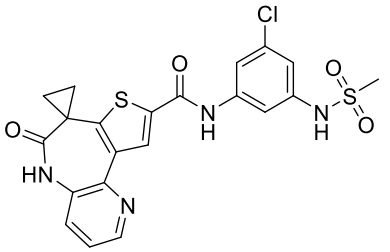
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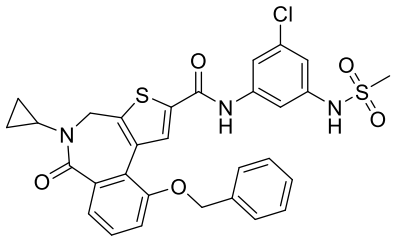
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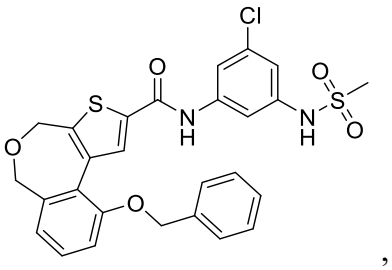
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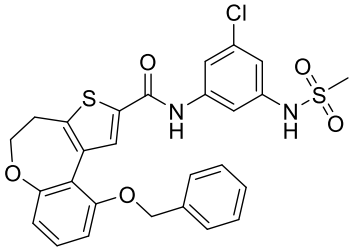
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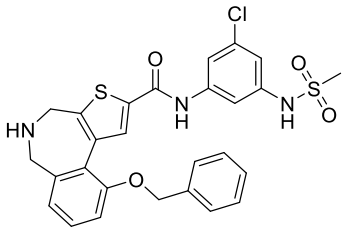
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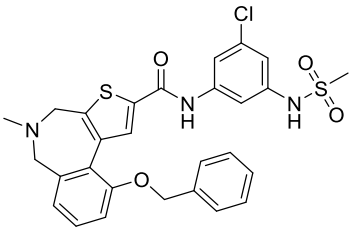
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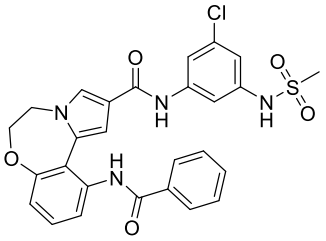
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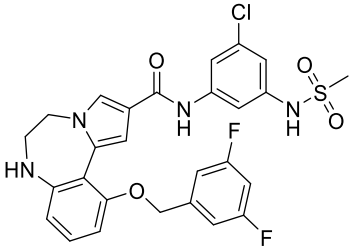
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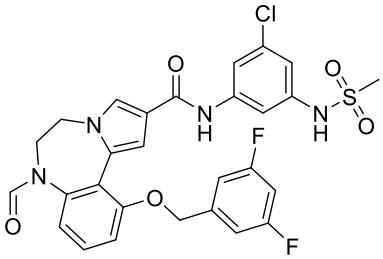
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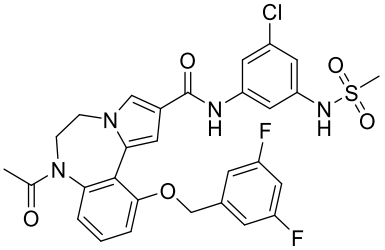
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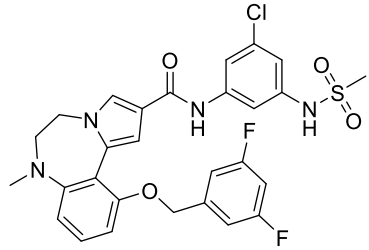
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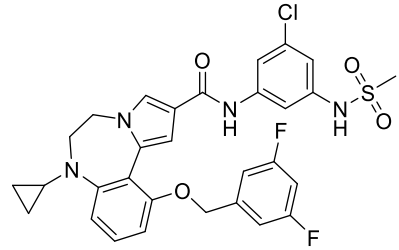
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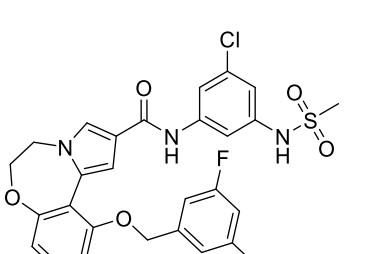
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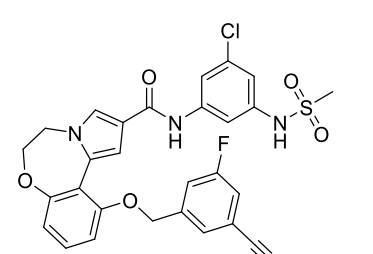
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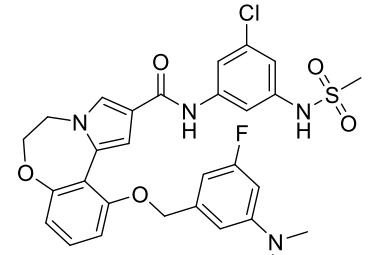
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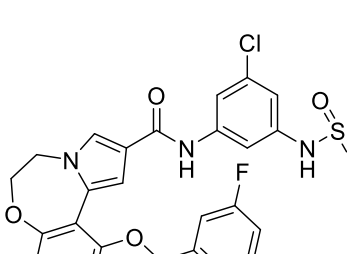
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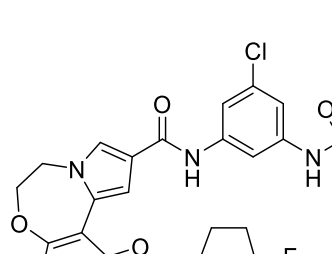
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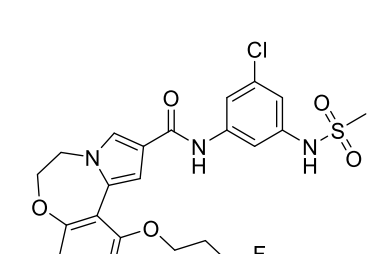
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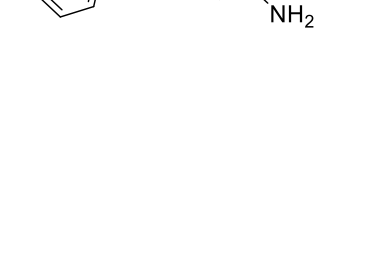
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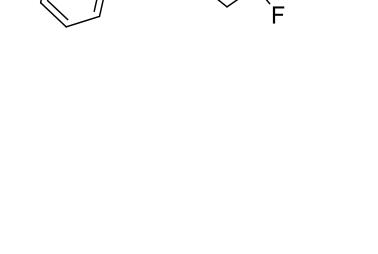
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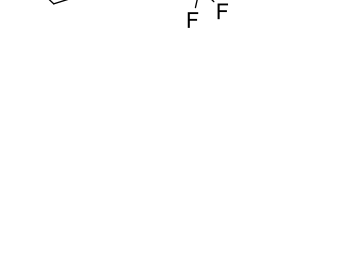
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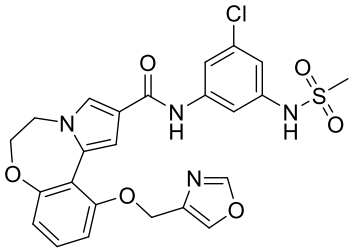
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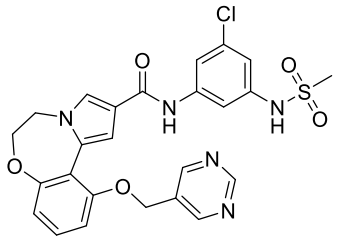
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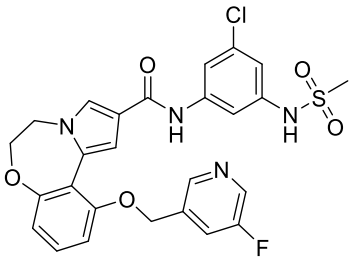
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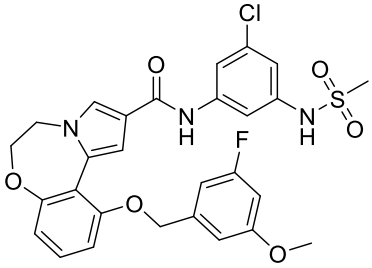
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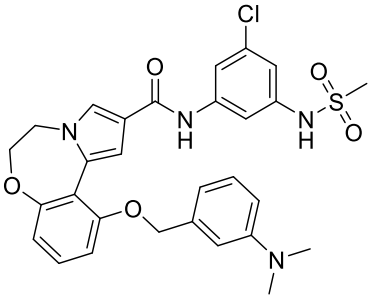
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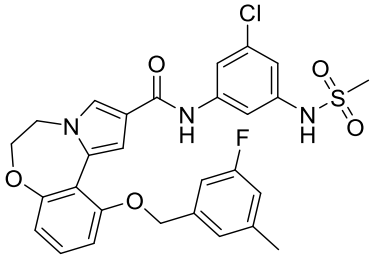
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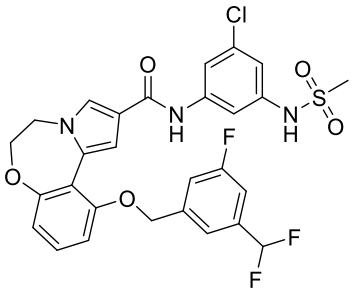
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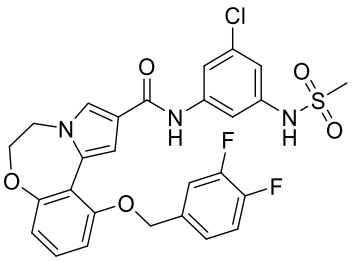
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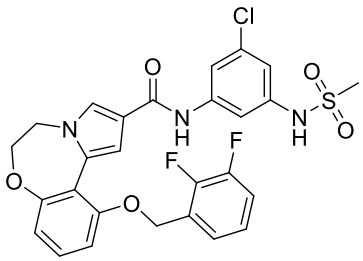
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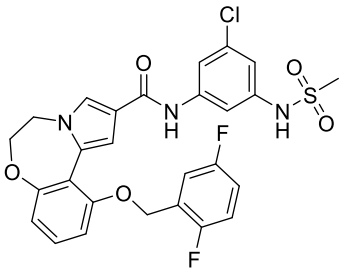
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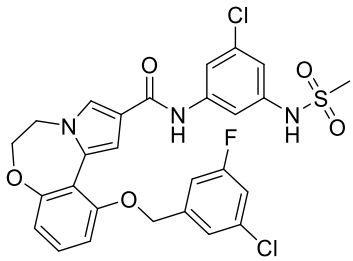
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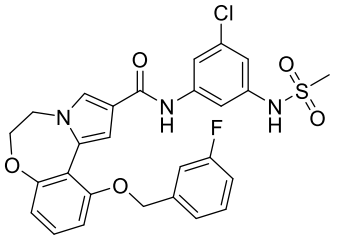
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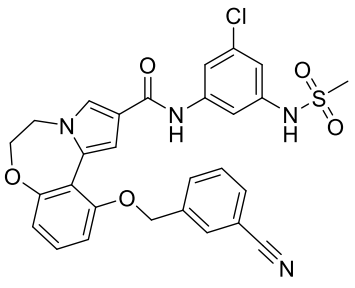
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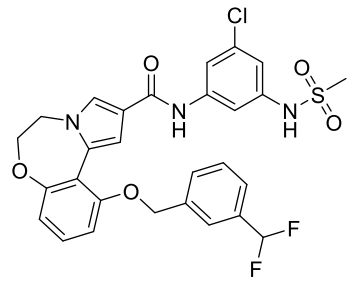
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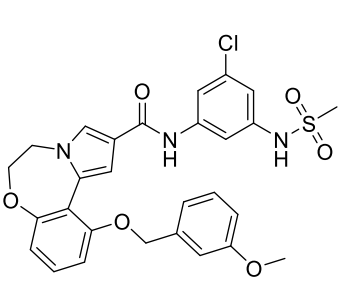
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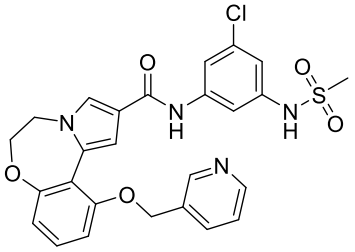
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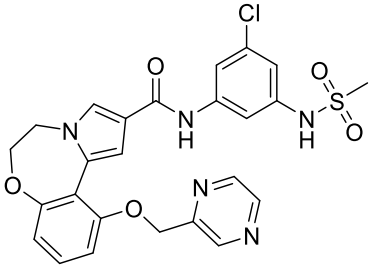
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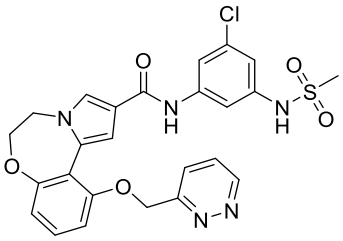
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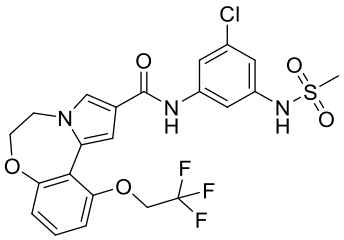
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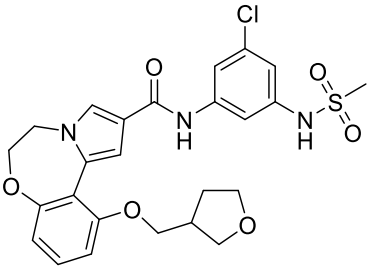
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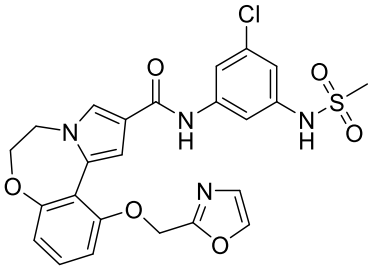
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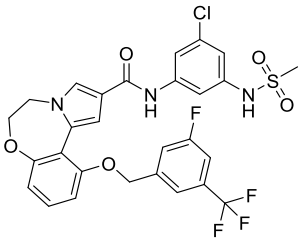
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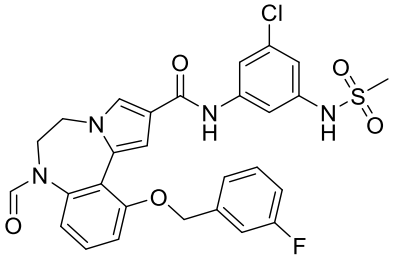
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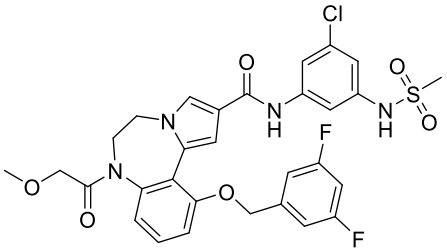
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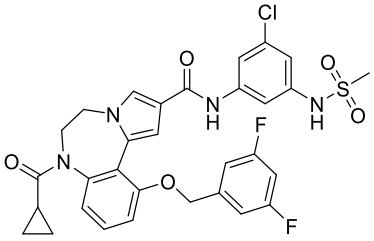
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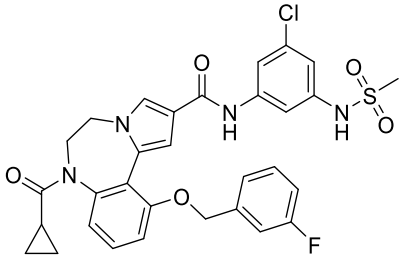
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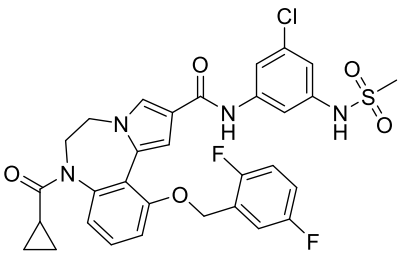
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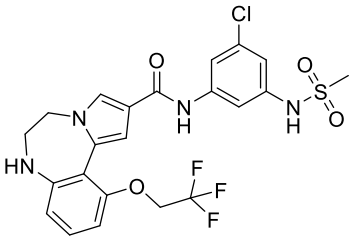
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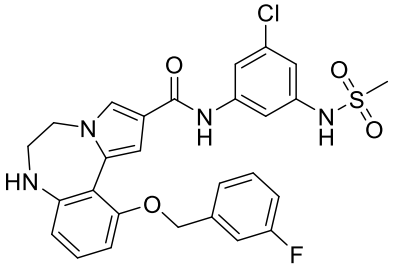
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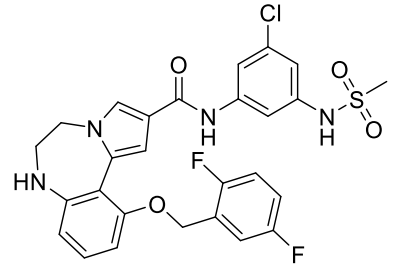
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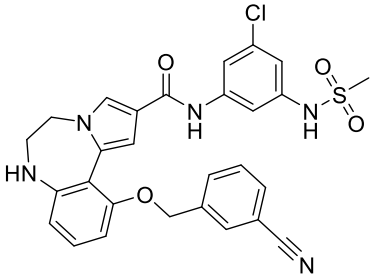
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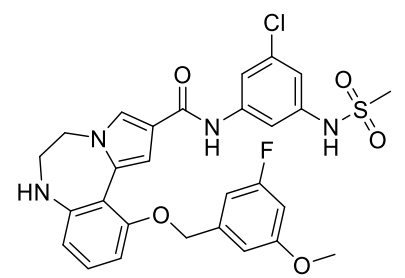
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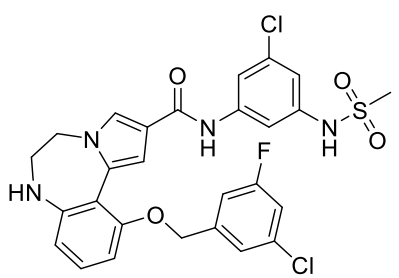
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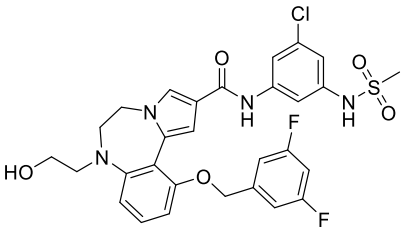
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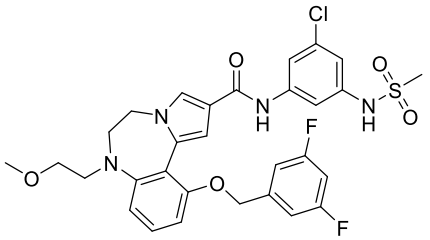
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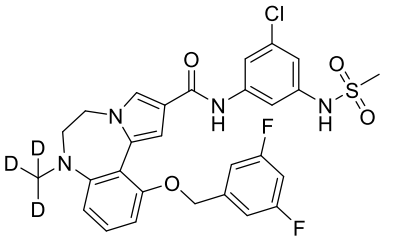
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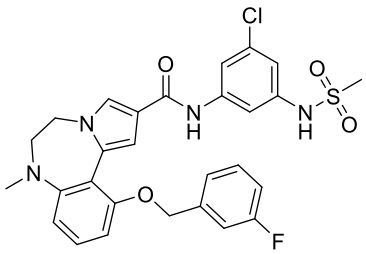
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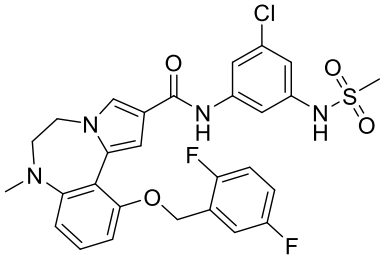
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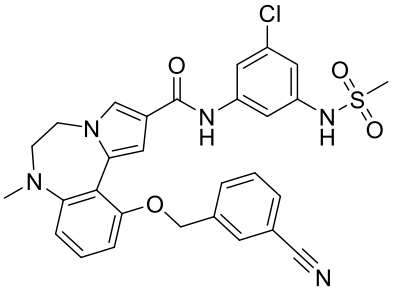
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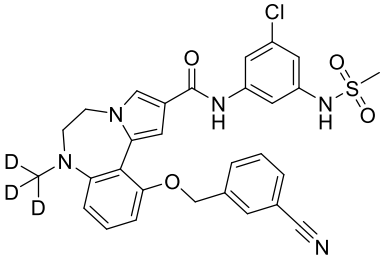
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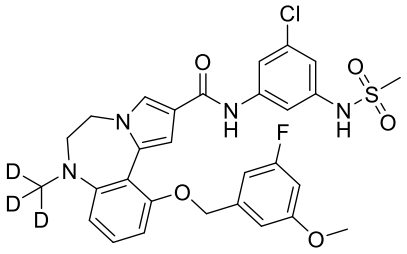
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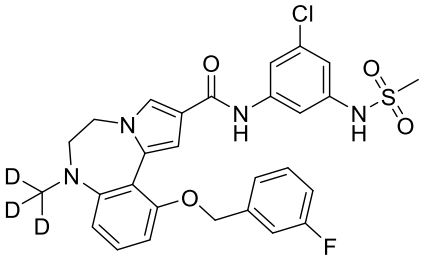
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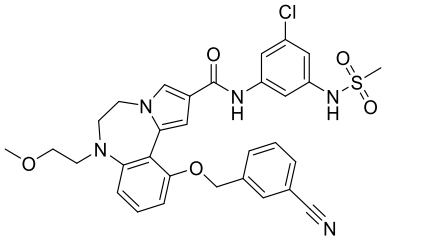
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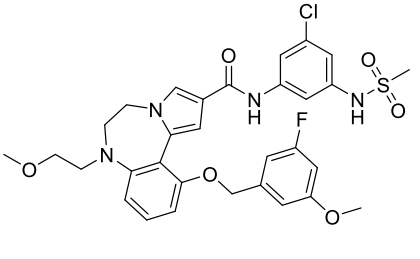
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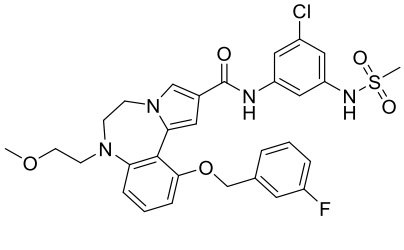
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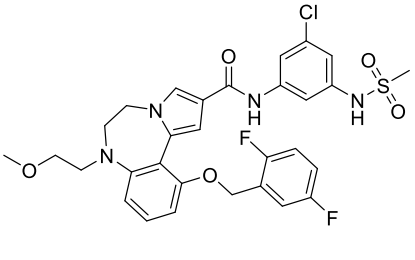
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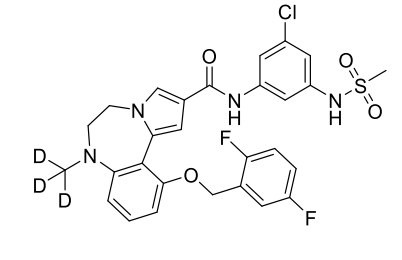
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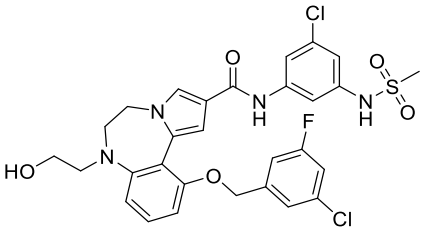
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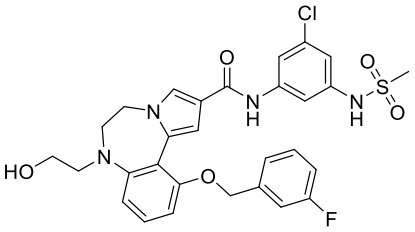
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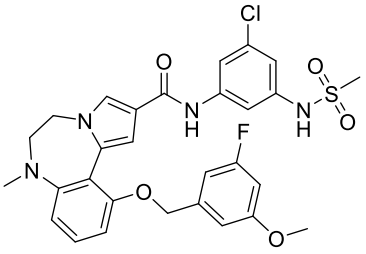
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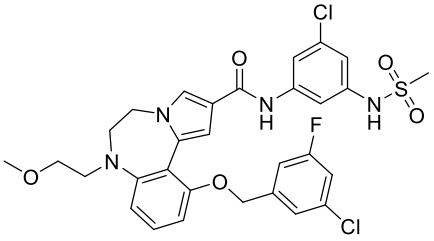
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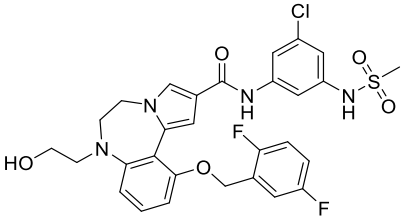
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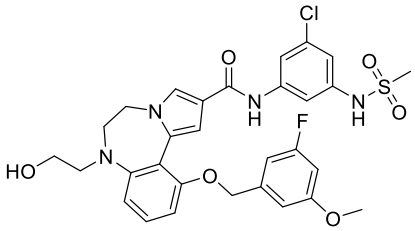
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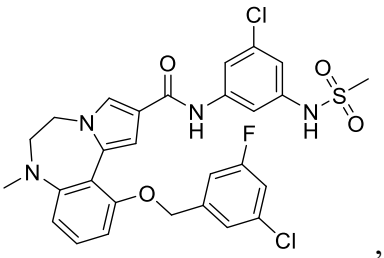
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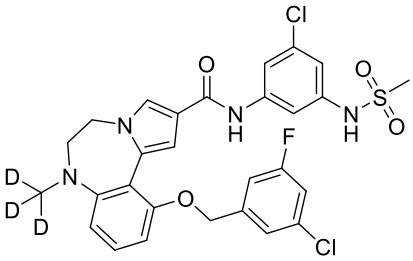
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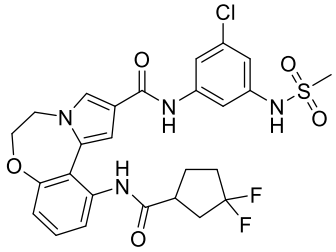
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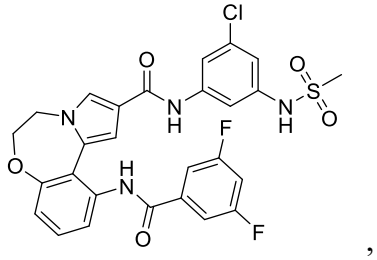
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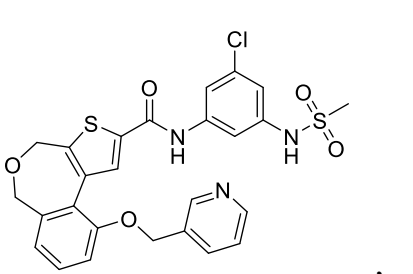
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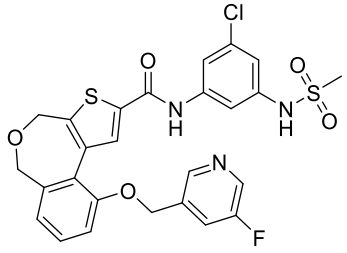
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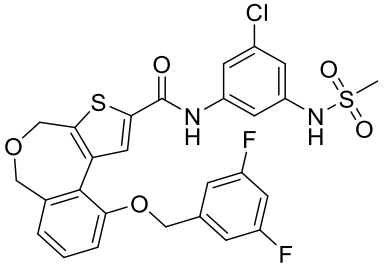
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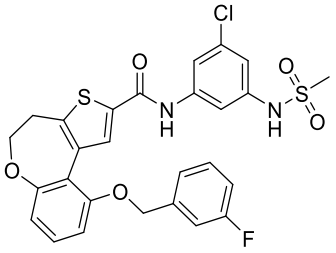
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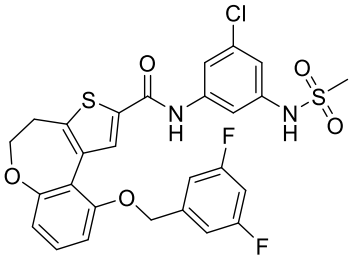
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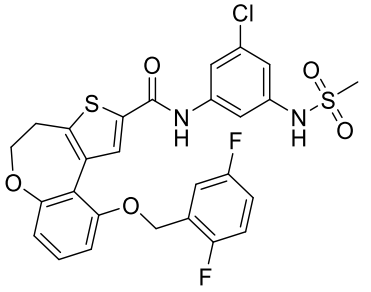
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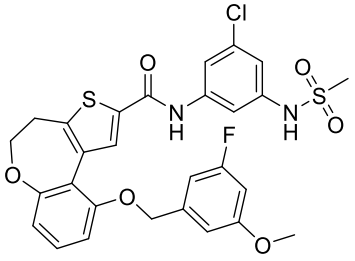
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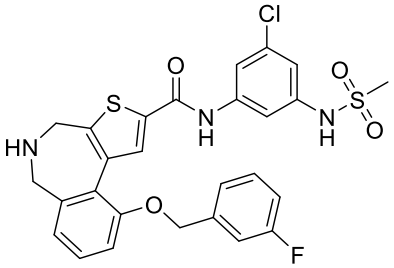
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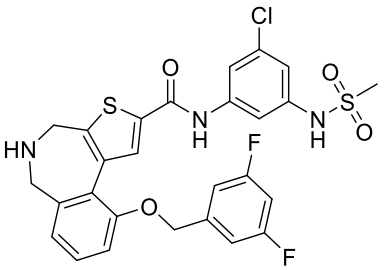
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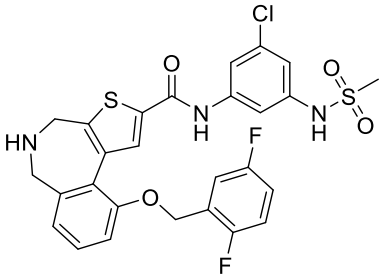
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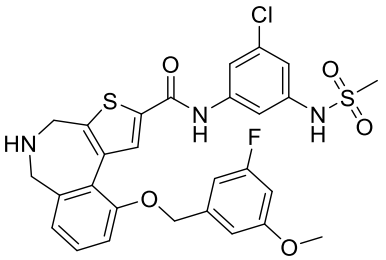
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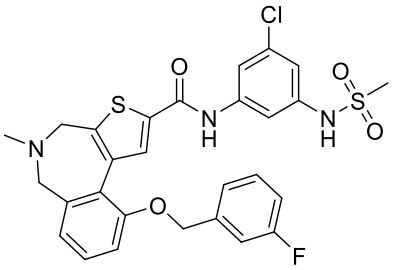
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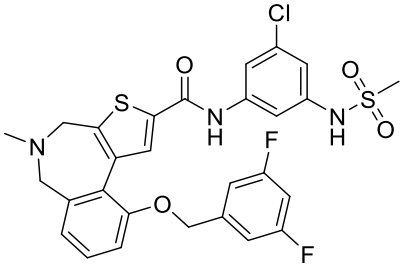
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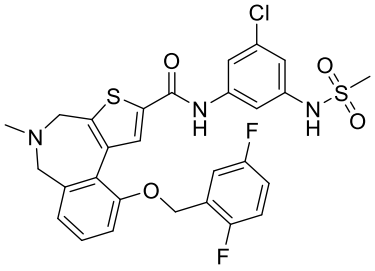
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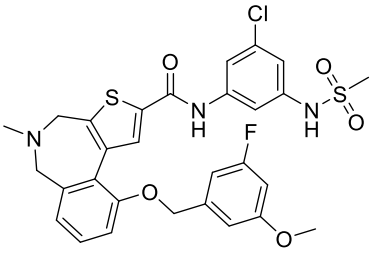
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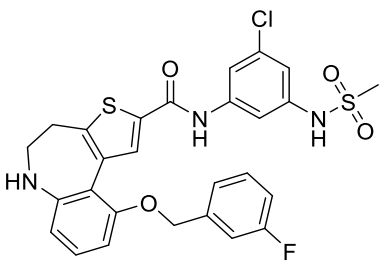
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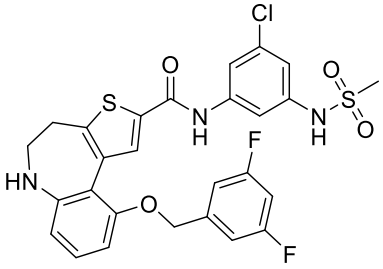
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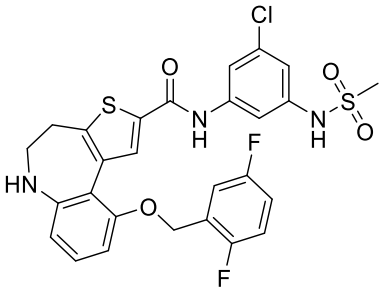
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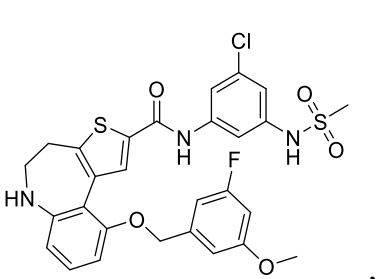
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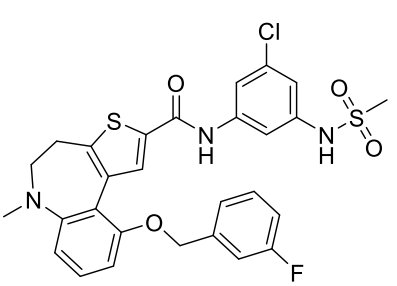
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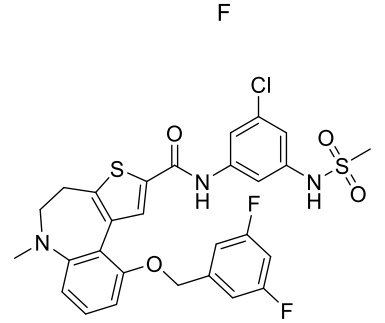
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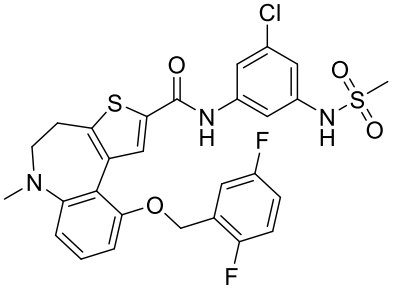
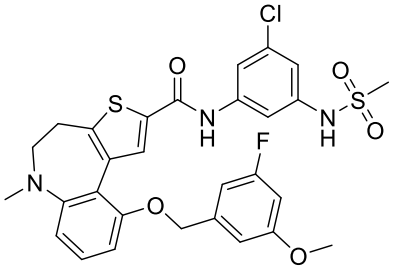
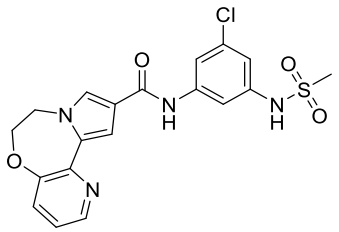
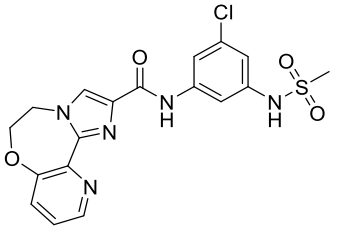
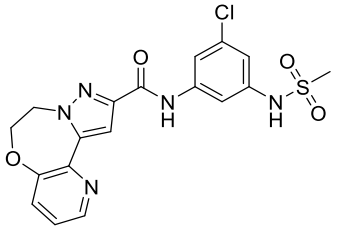
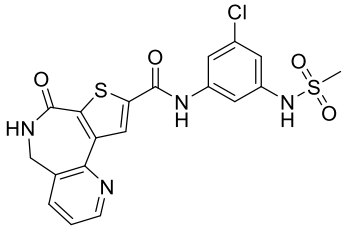
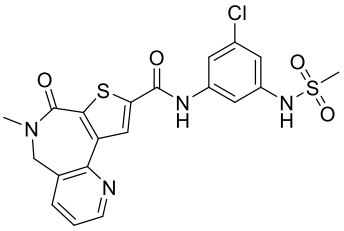
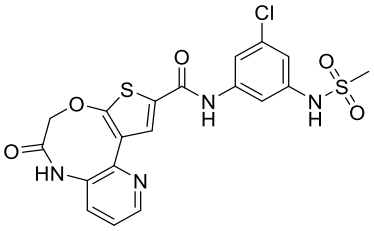
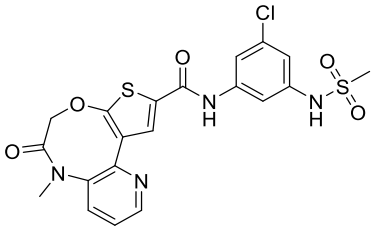
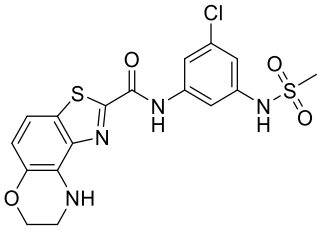
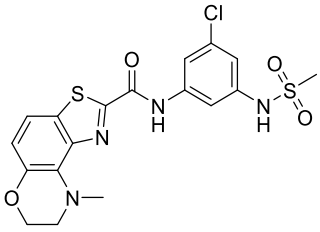
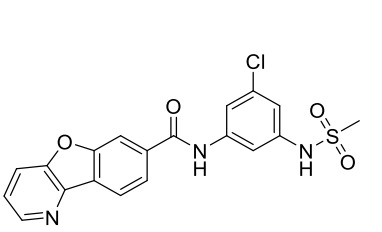
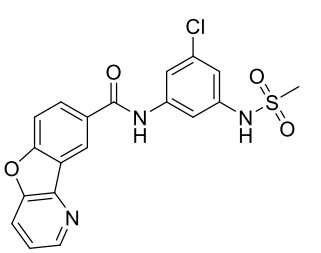
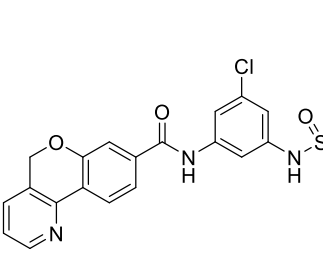
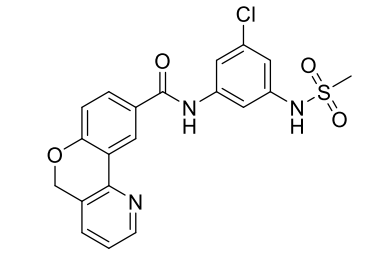
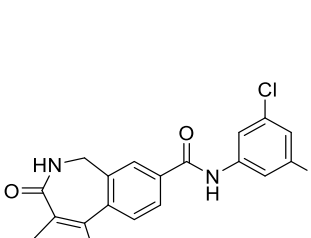
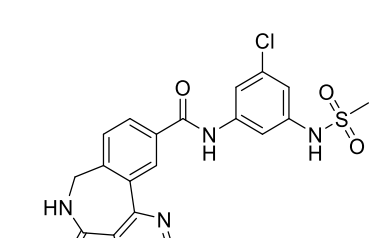
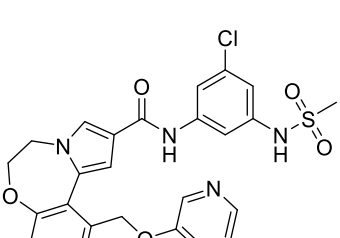
 ,  ,  ,

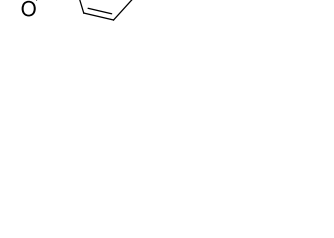
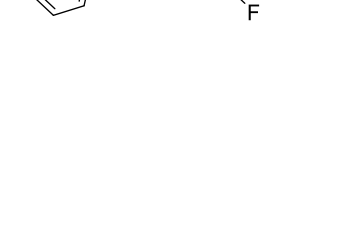
 ,  ,  ,

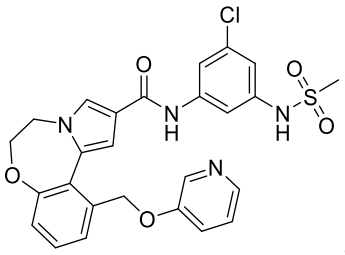
 ,  ,  ,

 ,  ,  ,

 ,  ,  ,

 ,  ,  ,

 ,  ,  ,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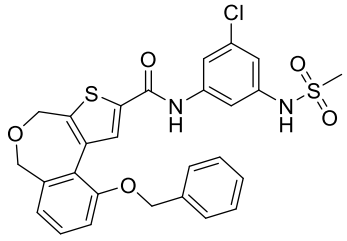
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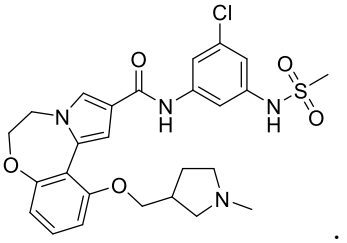
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11. A pharmaceutical composition, wherein the pharmaceutical composition contains an effective dose of the compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, and a pharmaceutically acceptable carrier, an excipient or a combination thereof.

12. The compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10 or the pharmaceutical composition according to claim 11 for use as a medicament.

13. Use of the compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, or the pharmaceutical composition according to claim 11, in the preparation of a DHX9 inhibitor.

14. Use of the compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, or the pharmaceutical composition according to claim 11, in the manufacture of a medicament for the treatment of a DHX9-mediated disease, wherein the DHX9-mediated disease is preferably cancer, viral infection or autoimmune disease, more preferably cancer; and still further preferably, the cancer is selected from colorectal cancer, endometrial cancer, ovarian cancer, gastric cancer, hematopoietic system cancer, breast cancer, brain cancer, skin cancer, lung cancer, blood cancer, prostate cancer, head and neck cancer, pancreatic cancer, bladder cancer, bone cancer, soft tissue cancer, renal cancer and liver cancer, even more preferably colorectal cancer, endometrial cancer, ovarian cancer, hematopoietic system cancer and gastric cancer; or

preferably, wherein the cancer is microsatellite instability cancer, more preferably high microsatellite instability cancer, and further preferably high microsatellite instability colorectal cancer.

15. Use of the compound, or the stereoisomer thereof, the tautomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 10, or the pharmaceutical composition according to claim 11, in the manufacture of a medicament for the treatment of cancer, viral infection or autoimmune disease, wherein, preferably, the cancer is selected from colorectal cancer, endometrial cancer, ovarian cancer, gastric cancer, hematopoietic system cancer, breast cancer, brain cancer, skin cancer, lung cancer, blood cancer, prostate cancer, head and neck cancer, pancreatic cancer, bladder cancer, bone cancer, soft tissue cancer, renal cancer and liver cancer, and further preferably, the cancer is selected from colorectal cancer, endometrial cancer, ovarian cancer, hematopoietic system cancer and gastric cancer; or

preferably, wherein the cancer is microsatellite instability cancer, more preferably high microsatellite instability cancer, and further preferably high microsatellite instability colorectal cancer.