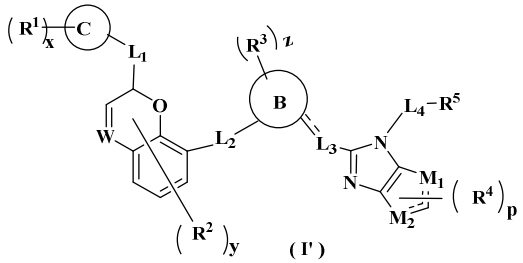
CLAIMS:

1. A compound of formula (I'), a stereoisomer thereof or a pharmaceutically acceptable salt thereof:



(I')

 is a single bond or a double bond;

ring B is selected from 5 to 10 membered heterocyclyl comprising 1 to 3 nitrogen atoms, oxygen atoms, or sulfur atoms;

ring C is selected from phenyl or pyridinyl;

L_1 is selected from the group consisting of a bond;

L_2 is selected from the group consisting of a bond ;

L_3 is selected from the group consisting of -CH_2-;

W is selected from CR_m or N;

R_m is selected from the group consisting of hydrogen, deuterium, halogen, cyano and C_{1-3} alkyl;

L_4 is selected from the group consisting of a bond and -CH_2-;

R^1 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, C_{1-6} deuterated alkoxy, C_{1-6} haloalkoxy, -$C(O)R_{aa}$ and -$C(O)NR_{aa}R_{bb}$;

R_{aa}, and R_{bb} are each independently selected from the group consisting of hydrogen, deuterium, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{3-8} cycloalkyl, 3 to 8 membered heterocyclyl, C_{6-10} aryl and 5 to 10 membered heteroaryl;

R^2 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, and C_{1-6} haloalkoxy;

R^3 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, methyl, deuterated methyl, and halomethyl ;

R^4 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, oxo, C_{1-6} carboxy, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl and 5 to 6 membered heteroaryl comprising 1 to 4 nitrogen atoms, oxygen atoms, or sulfur atoms, wherein the C_{1-6} carboxy and 5 to 6 membered heteroaryl comprising 1 to 4 nitrogen atoms, oxygen atoms are each optionally further substituted by one or more substituents selected from the group consisting of oxo, halogen, cyano,

C_{1-3} deuterated alkyl, C_{1-3} haloalkyl, C_{1-3} alkoxy, C_{1-3} deuterated alkoxy, and C_{1-3} haloalkoxy;

R^5 is selected from the group consisting of C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{3-8} cycloalkyl, 3 to 8 membered heterocyclyl, C_{6-10} aryl and 5 to 10 membered heteroaryl, optionally further substituted by one or more substituents selected from the group consisting of halogen, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{1-6} cyanoalkyl, C_{3-8} cycloalkyl, and 3 to 8 membered heterocyclyl;

M_1 is selected from the group consisting of N, NH, O, S, C and $(CH)_{n9}$;

M_2 is selected from the group consisting of N, NH, O, S, C and $(CH)_{n10}$;

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

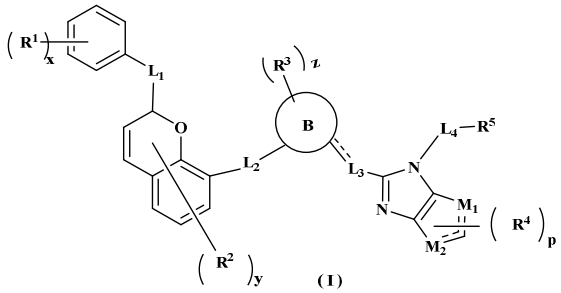
y is 0, 1, 2, 3 or 4;

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

p is 0, 1, 2, or 3;

n9 or n10 is each independently integer from 0 to 2.

2. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 1, characterized in that the compound is further shown as formula (I):



(I)

L_4 is selected from the group consisting of a bond and $-CH_2-$;

R^4 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, oxo, C_{1-6} carboxy, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl and 5 to 6 membered heteroaryl comprising 1 to 4 nitrogen atoms, oxygen atoms, or sulfur atoms, wherein the C_{1-6} carboxy and 5 to 6 membered heteroaryl comprising 1 to 4 nitrogen atoms, oxygen atoms are each optionally further substituted by one or more substituents selected from the group consisting of oxo, halogen, cyano, C_{1-3} deuterated alkyl, C_{1-3} haloalkyl, C_{1-3} alkoxy, C_{1-3} deuterated alkoxy, and C_{1-3} haloalkoxy;

R^5 is selected from the group consisting of C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{3-8} cycloalkyl, 3 to 8 membered heterocyclyl, C_{6-10} aryl and 5 to 10 membered heteroaryl, optionally further substituted by one or more substituents selected from the group consisting of halogen, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{1-6} cyanoalkyl, C_{3-8} cycloalkyl, and 3 to 8 membered heterocyclyl;

M_1 is selected from the group consisting of N, NH, O, S, C and $(CH)_{n9}$;

M_2 is selected from the group consisting of N, NH, O, S, C and $(CH)_{n10}$;

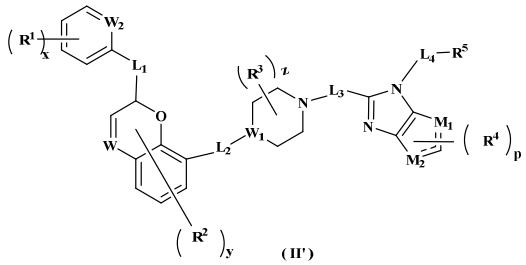
p is 0, 1, 2, or 3;

n9 or n10 is each independently integer from 0 to 2.

3. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 1 or 2, characterized in that,

ring B is selected from the group consisting of piperidinyl and piperazinyl.

4. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 1, characterized in that the compound is further shown as formula (II'):



(II')

W_1 is selected from CH or N;

W_2 is selected from CR_{m5} or N;

R^1 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, C_{1-6} deuterated alkoxy, C_{1-6} haloalkoxy, $-C(O)R_{aa}$ and $-C(O)NR_{aa}R_{bb}$;

R_{aa}, and R_{bb} are each independently selected from the group consisting of hydrogen, deuterium, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{3-8} cycloalkyl, 3 to 8 membered heterocyclyl, C_{6-10} aryl and 5 to 10 membered heteroaryl;

R^2 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, and C_{1-6} haloalkoxy;

R^3 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, methyl, deuterated methyl, and halomethyl;

R_{m5} is selected from the group consisting of hydrogen, and deuterium;

R^4 is each independently selected from the group consisting of carboxy and $-C(O)OCH_3$;

R^5 is selected from the group consisting of C_{3-8} cycloalkyl and 3 to 8 membered heterocyclyl, optionally further substituted by one or more substituents selected from the group consisting of halogen, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} cyanoalkyl, C_{3-8} cycloalkyl, and 3 to 8 membered heterocyclyl;

L_1 and L_2 are each independently selected from a bond;

L_3 is selected from -CH_2-;

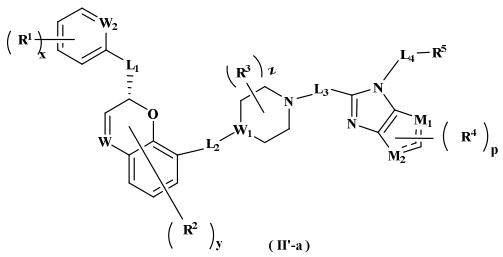
L_4 is selected from -CH_2-;

M_1 is selected from the group consisting of N, NH, O, S, C and $(CH)_{n9}$;

M_2 is selected from the group consisting of N, NH, O, S, C and $(CH)_{n10}$;

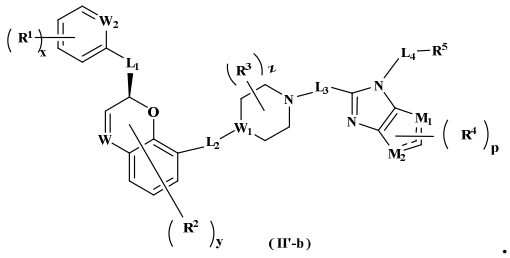
n9 or n10 is each independently integer from 0 to 2.

5. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 1, characterized in that the compound is further shown as formula (II'-a) or (II'-b):



(II'-a)

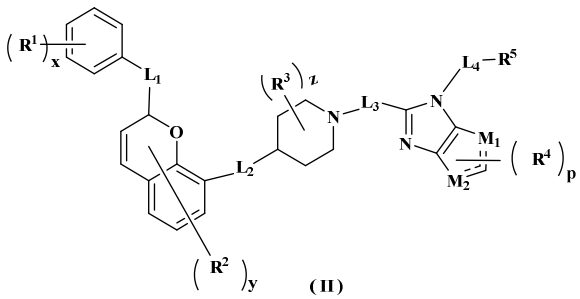
or



(II'-b)

.

6. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 3, characterized in that the compound is further shown as formula (II):



(II)

R^1 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, C_{1-6} deuterated alkoxy and C_{1-6} haloalkoxy;

R^2 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} alkoxy, and C_{1-6} haloalkoxy;

R^3 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, methyl, deuterated methyl, and halomethyl;

R^4 is each independently selected from the group consisting of carboxy and -

$C(O)OCH_3$;

R^5 is selected from the group consisting of C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{3-8} cycloalkyl, 3 to 8 membered heterocyclyl, C_{6-10} aryl and 5 to 10 membered heteroaryl, optionally further substituted by one or more substituents selected from the group consisting of halogen, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{1-6} hydroxyalkyl, C_{1-6} alkoxy, C_{1-6} haloalkoxy, C_{1-6} cyanoalkyl, C_{3-8} cycloalkyl, and 3 to 8 membered heterocyclyl;

M_1 is selected from the group consisting of O, S, N, NH, C, CH and $(CH)_2$;

M_2 is selected from the group consisting of O, S, N, NH, C, CH and $(CH)_2$;

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

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

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

p is 0, 1, 2, or 3.

7. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 6, characterized in that,

R^5 is selected from the group consisting of C_{3-8} cycloalkyl and 3 to 8 membered heterocyclyl, optionally further substituted by one or more substituents selected from the group consisting of halogen, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl and C_{1-6} cyanoalkyl.

8. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 6, characterized in that,

R^1 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-3} alkyl, C_{1-3} deuterated alkyl, C_{1-3} haloalkyl, C_{1-3} alkoxy, and C_{1-3} haloalkoxy;

R^2 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-3} alkyl, C_{1-3} deuterated alkyl, C_{1-3} haloalkyl, C_{1-3} alkoxy, and C_{1-3} haloalkoxy;

R^3 is each independently selected from the group consisting of hydrogen, deuterium, and fluorine;

R^4 is each independently selected from carboxy;

R^5 is selected from the group consisting of C_{3-8} cycloalkyl and 3 to 8 membered heterocyclyl, optionally further substituted by one or more substituents selected from the group consisting of halogen, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} haloalkyl, C_{3-8} cycloalkyl and 3 to 8 membered heterocyclyl;

L_1 and L_2 are each independently selected from a bond;

L_3 is selected from $-CH_2-$;

L_4 is selected from $-CH_2-$.

9. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 7, characterized in that,

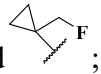
R^1 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, $-OCD_3$ and methoxy;

R^2 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, and methyl;

R^3 is each independently selected from hydrogen;

R^4 is each independently selected from the group consisting of carboxy and $-C(O)OCH_3$;

R^5 is selected from the group consisting of , 

and 

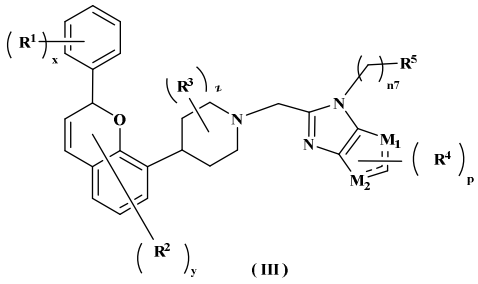
;

L_1 and L_2 are each independently selected from a bond;

L_3 is selected from $-CH_2-$;

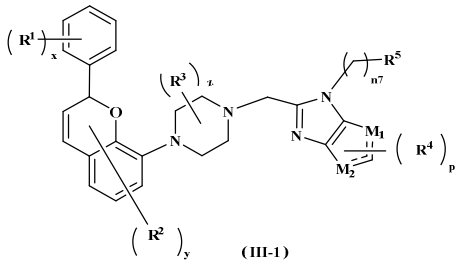
L_4 is selected from $-CH_2-$.

10. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 4, characterized in that the compound is further shown as formula (III)-(III-1):



(III)

or



(III-1)

wherein:

R^5 is selected from C_{3-8} cycloalkyl, or 3 to 8 membered heterocyclyl, optionally further substituted by one or more substituents selected from the group consisting of halogen, C_{1-6} alkyl, C_{1-6} deuterated alkyl, C_{1-6} cyanoalkyl, and C_{1-6} haloalkyl;

M_1 is selected from the group consisting of O, S, N, C, CH and $(CH)_2$;

M_2 is selected from the group consisting of O, S, N, C, CH and $(CH)_2$;

n7 is 1;

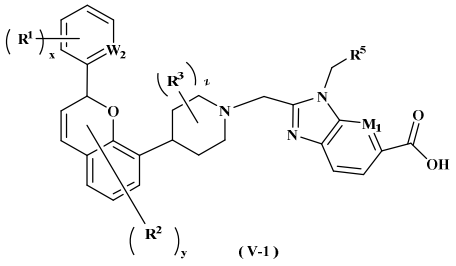
x is 0, 1, 2, 3 ,4 or 5;

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

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

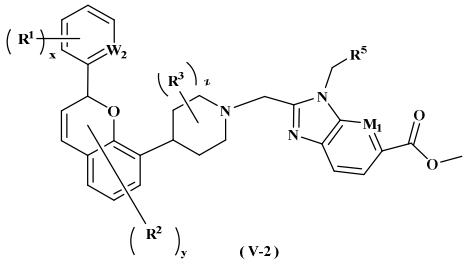
p is 0, 1, 2, or 3.

11. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 4, characterized in that the compound is further shown as formula (V-1) and (V-2):



(V-1)

or



(V-2)

wherein:

R^1 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-3} alkyl, C_{1-3} deuterated alkyl, C_{1-3} haloalkyl, C_{1-3} alkoxy, C_{1-3} deuterated alkoxy, and C_{1-3} haloalkoxy;

R^2 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, cyano, C_{1-3} alkyl, C_{1-3} deuterated alkyl, C_{1-3} haloalkyl, C_{1-3} alkoxy, and C_{1-3} haloalkoxy;

R^3 is each independently selected from the group consisting of hydrogen, deuterium, and fluorine;

M_1 is selected from N or CH;

W_2 is selected from N or CH;

x, y and z are each independently 0, 1, or 2;

R^5 is selected from the group consisting of , 

and 

.

12. The compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to claim 11, characterized in that,

R^1 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, methoxy and $-OCD_3$;

R^2 is each independently selected from the group consisting of hydrogen, deuterium, fluorine, chlorine, and methyl;

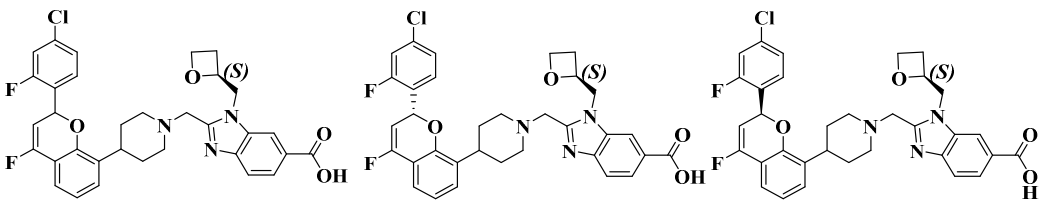
R^3 is each independently selected from hydrogen;

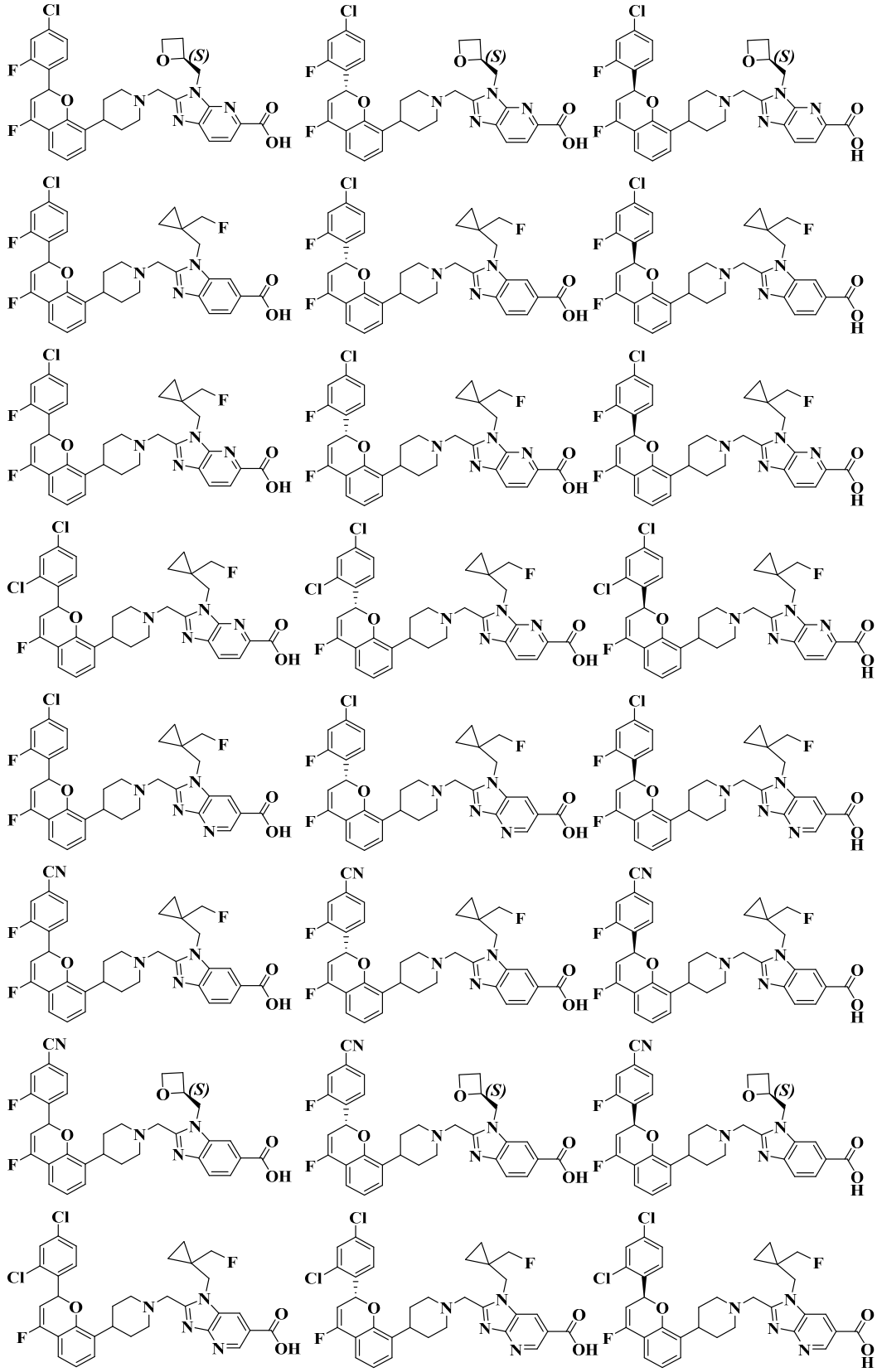
M_1 is selected from N;

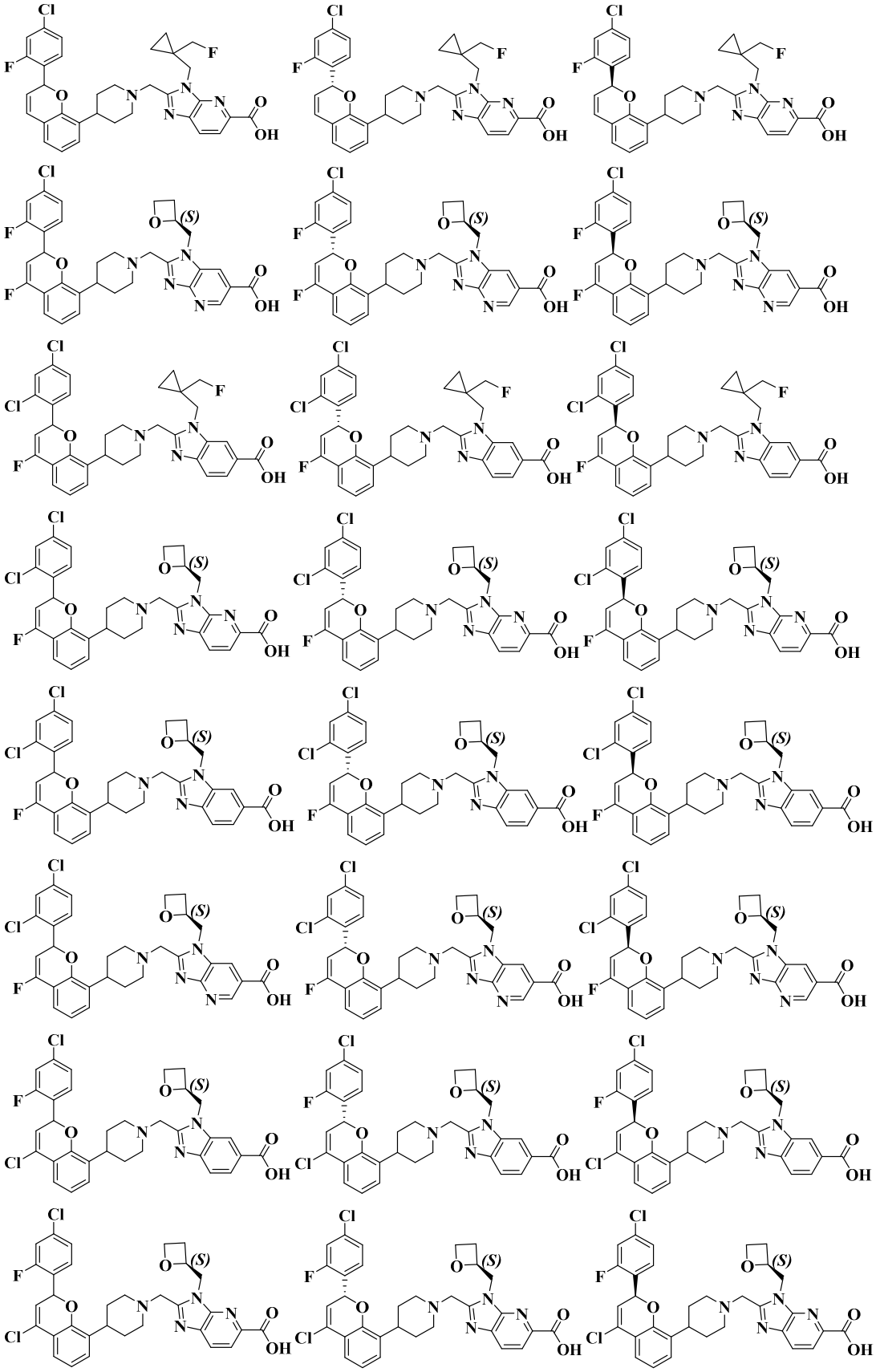
W_2 is selected from CH;

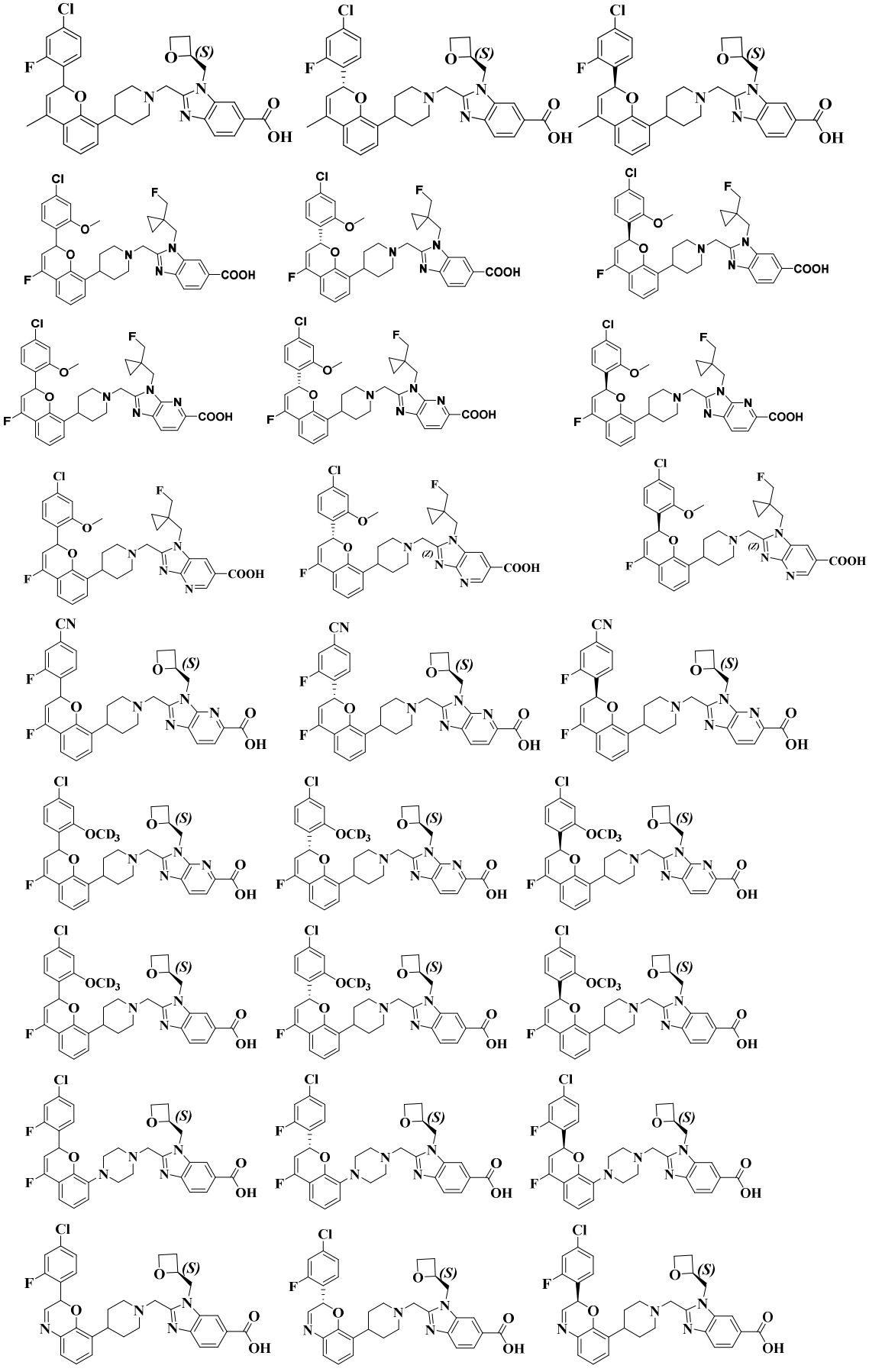
R^5 is selected from .

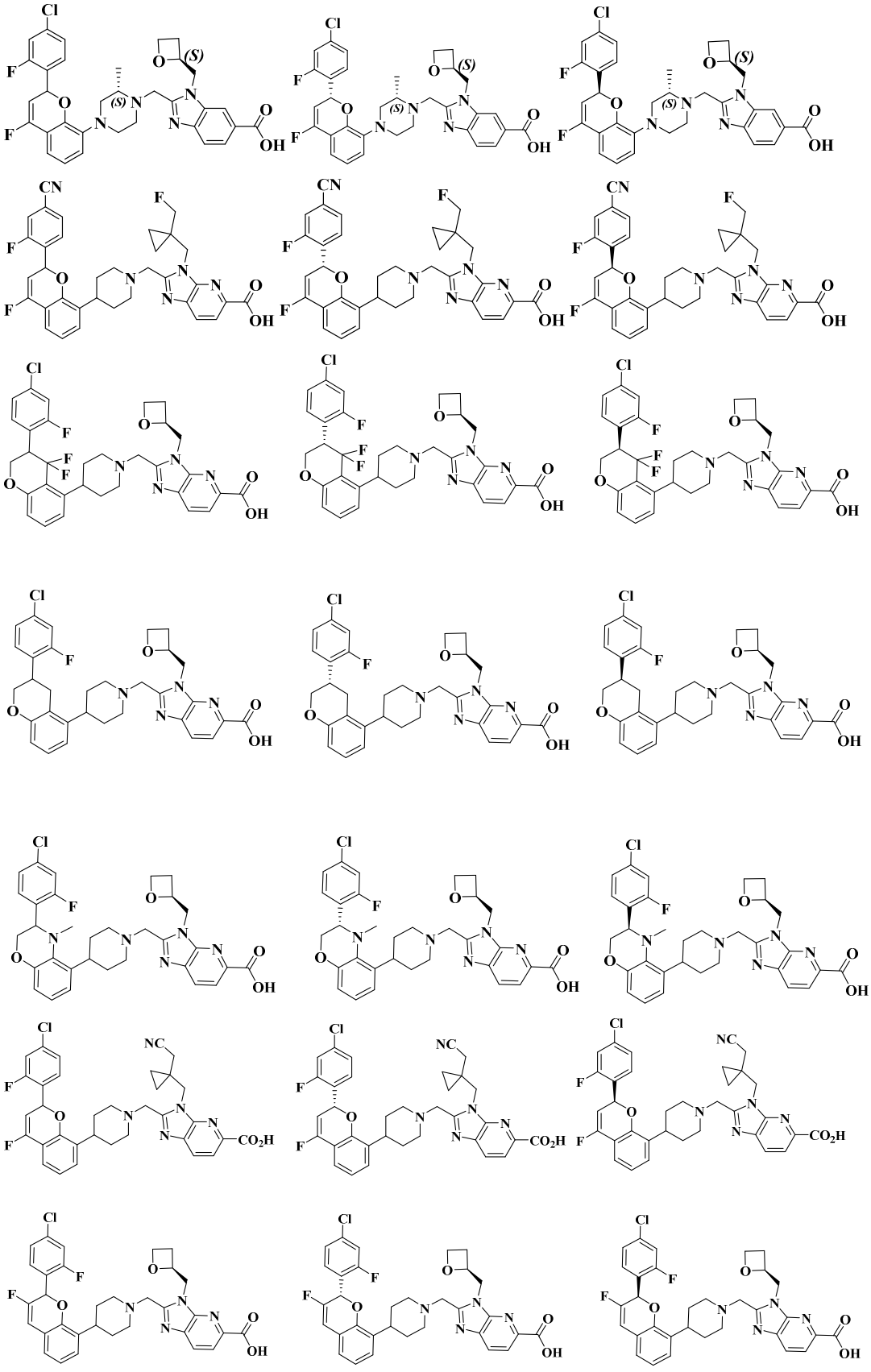
13. A compound as shown below, the stereoisomer thereof or the pharmaceutically acceptable salt thereof, wherein, the compound structure is as follows:

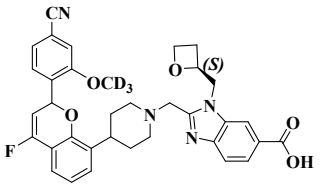
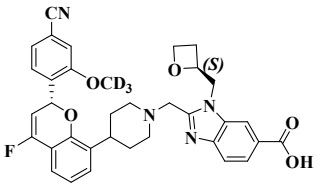
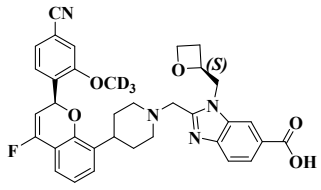
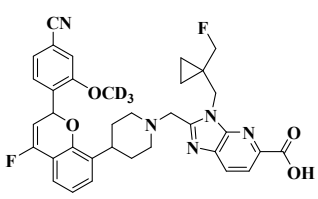
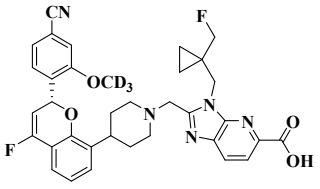
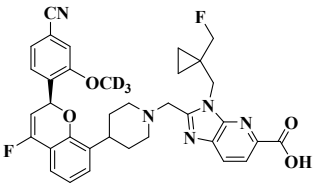
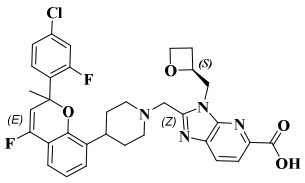
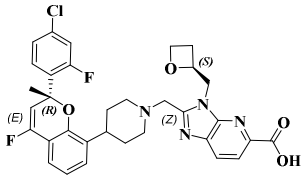
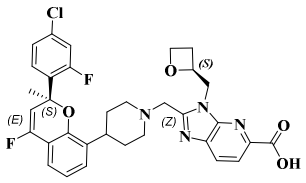
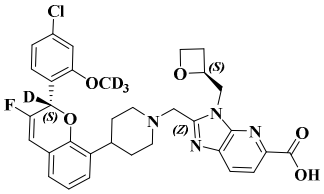
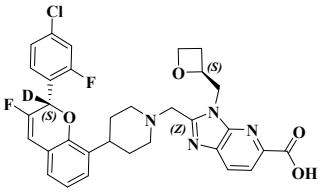
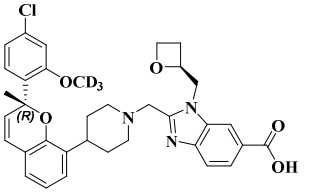
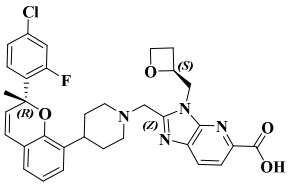
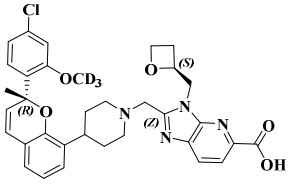
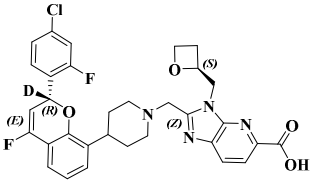
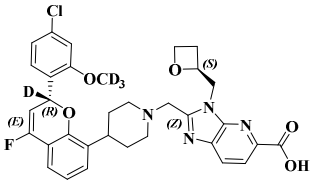
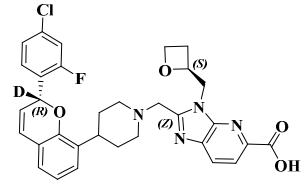
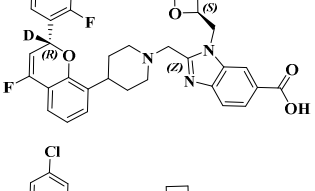
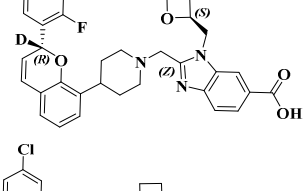
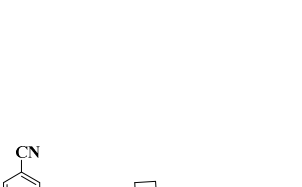


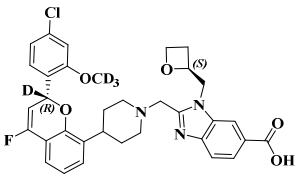
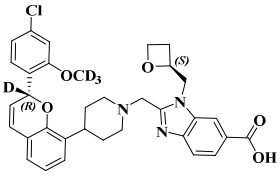
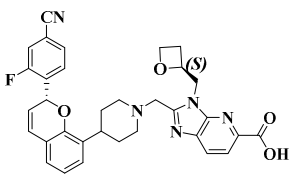


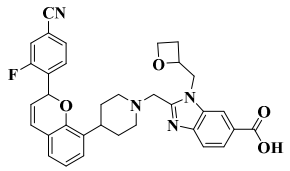
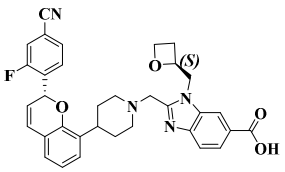
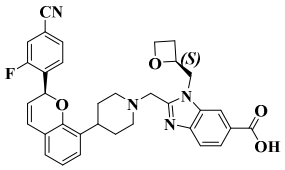
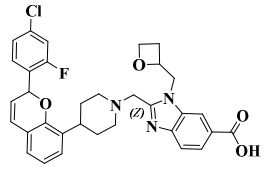
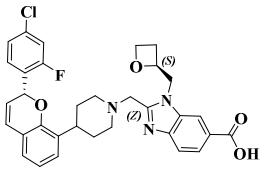
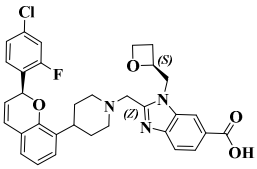
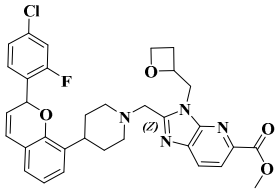
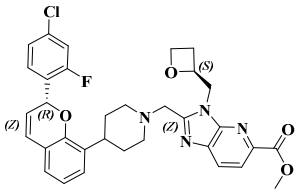
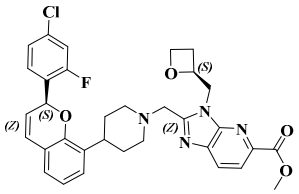
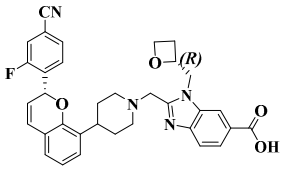
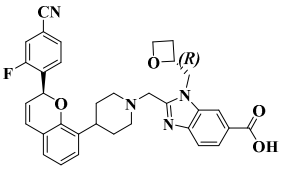
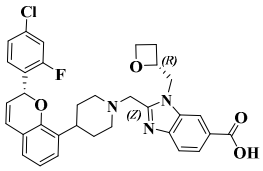
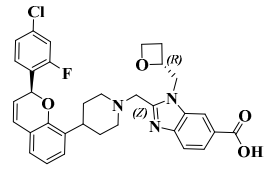
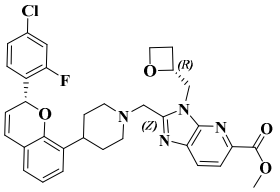
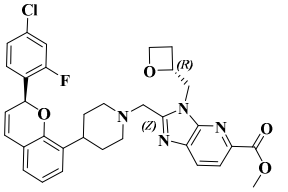


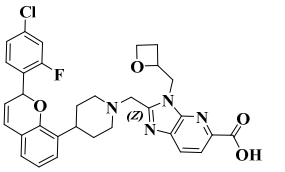
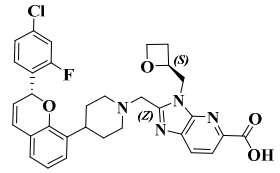
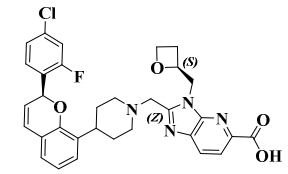
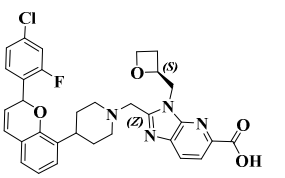
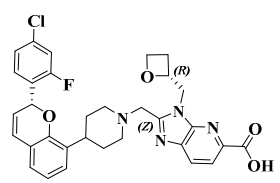
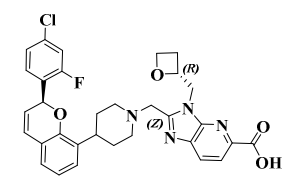
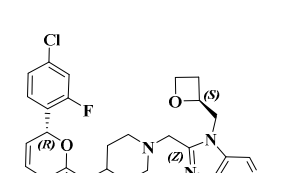
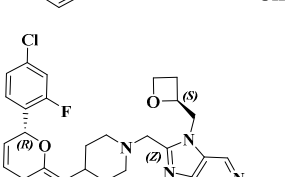
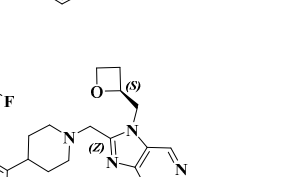
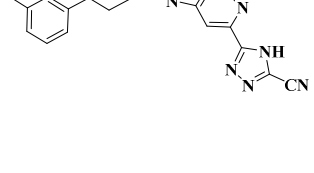
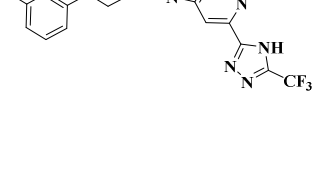
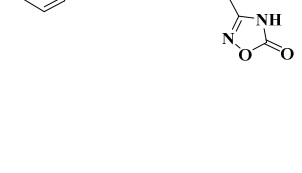


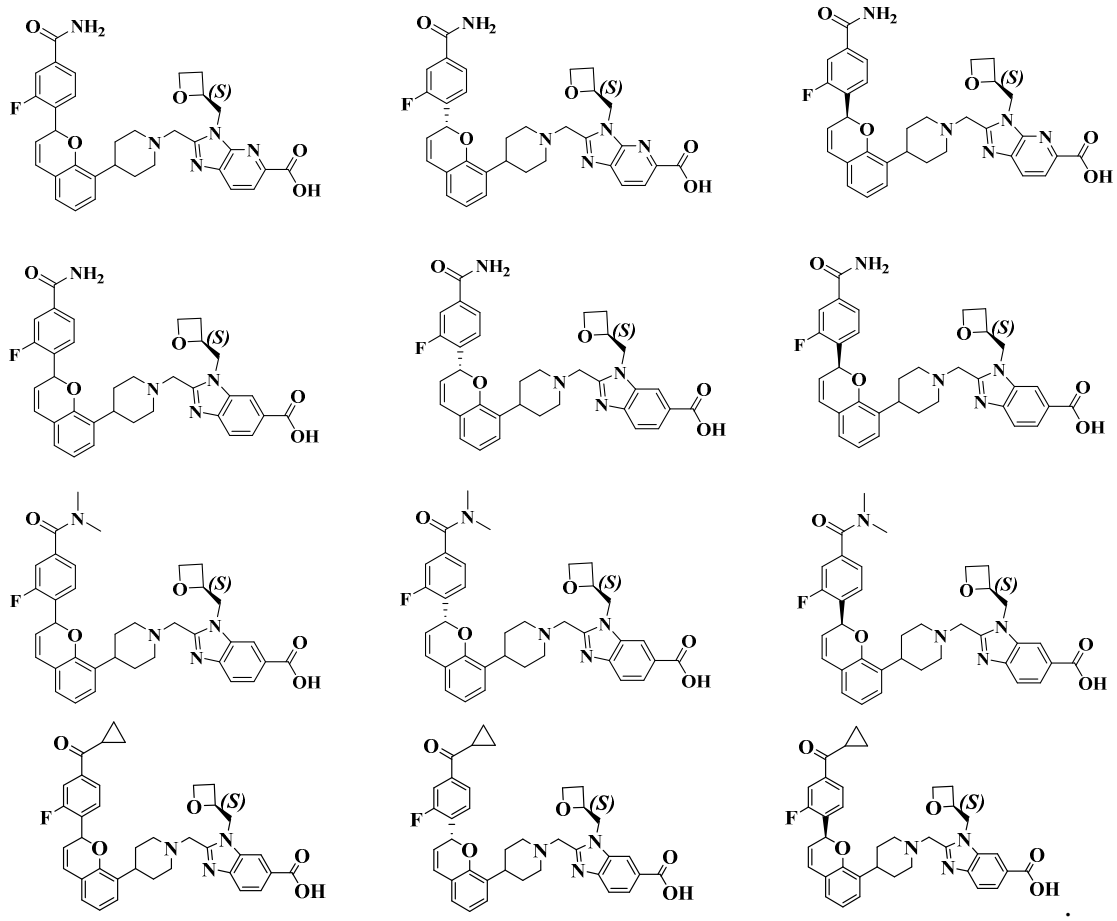




14. A pharmaceutical composition comprising a therapeutically effective dose of the compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 13, and one or more pharmaceutically acceptable carriers or excipients.

15. Use of the compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 13, or the pharmaceutical composition according to claim 14 in the preparation of a GLP-1 receptor agonist medicament.

16. Use of the compound, the stereoisomer thereof or the pharmaceutically acceptable salt thereof according to any one of claims 1 to 13, or the pharmaceutical composition according to claim 14 in the preparation of a medicament for treating metabolic related diseases; wherein the metabolic related diseases are selected from diabetes, obesity or nonalcoholic steatohepatitis related diseases or other related diseases caused by diabetes, obesity or nonalcoholic steatohepatitis.