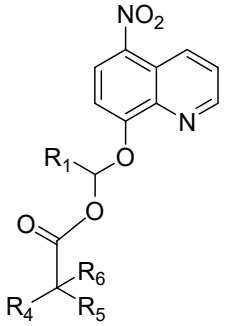
CLAIMS

1. A compound of formula (II),



(II)

or a mesomer, racemate, enantiomer, diastereomer thereof, or mixture thereof, or a pharmaceutically acceptable salt thereof,

wherein,

R_1 is selected from the group consisting of hydrogen and C_{1-6} alkyl;

R_4, R_5 and R_6 are each independently selected from the group consisting of hydrogen, C_1-C_{12} alkyl, 5-7 membered heterocyclyl, C_6-C_{10} aryl, 5-10 membered heteroaryl, $-OR_{12}$, $-SR_{12}$, $-C(O)R_{11}$, $-C(O)OR_{12}$, $-C(O)-(CH_2)_m-C(O)R_{11}$, $-OC(O)R_{11}$, $-NR^aR^b$, $-N(R^c)C(O)R^d$, $-C(O)N(R^a)(R^b)$, $-N(R^c)S(O)_pR^d$, $-S(O)_pN(R^a)(R^b)$, $-O(CH_2)_mO(CH_2)_qR_{12}$, $-(CH_2)_m-N(R^c)C(O)R_{11}$ and $-N(R^c)C(O)-(CH_2)_m-N(R^c)C(O)R^d$, wherein the C_1-C_{12} alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, C_1-C_6 alkyl, OR_{12}, SR_{12}, $-C(O)R_{11}$, $-C(O)OR_{12}$, $-OC(O)R_{11}$, $-N(R^c)C(O)R^d$, $-O(CH_2)_mO(CH_2)_qR_{12}$, 5-7 membered heterocyclyl, C_6-C_{10} aryl, C_6-C_{10} arylalkyl, 5-10 membered heteroaryl and 5-10 membered heteroarylalkyl, wherein the C_6-C_{10} aryl, C_6-C_{10} arylalkyl, 5-10 membered heteroaryl and 5-10 membered heteroarylalkyl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen and hydroxy; or

any one of R_4, R_5 and R_6 is hydrogen, and the remaining two together with Z form a C_3-C_6 cycloalkyl or 5-7 membered heterocyclyl, wherein the C_3-C_6 cycloalkyl or 5-7 membered heterocyclyl is optionally further substituted by one or more substituent(s) selected from the group consisting of $-C(O)R_{11}$ and $-C(O)OR_{12}$;

R_{11} and R_{12} are each independently selected from the group consisting of hydrogen, halogen, hydroxy, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, nitro, thiol, C_1-C_6 alkyl, C_1-C_6 alkoxy, $-OR^d$, $-N(R^c)C(O)R^d$, $-C(O)N(R^a)(R^b)$, $-N(R^c)S(O)_pR^d$, $-S(O)_pN(R^a)(R^b)$, C_6-C_{10} aryl and 5-10 membered heteroaryl;

R^a and R^b are each independently selected from the group consisting of hydrogen and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen;

or, R^a and R^b together with the atoms to which they are attached form a 5-7 membered heterocyclyl, wherein the 5-7 membered heterocyclyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, oxo, and C_1-C_6 alkyl;

R^c and R^d are each independently selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, nitro and C_1-C_6 alkyl;

m is selected from an integer from 0 to 6;

p is selected from the group consisting of 0, 1 and 2;

q is selected from an integer from 0 to 6.

2. The compound of formula (II) according to claim 1, wherein,

R_4, R_5 and R_6 are each independently selected from the group consisting of hydrogen, C_1-C_{12} alkyl, C_6-C_{10} aryl, 5-10 membered heteroaryl, -OR_{12}, -SR_{12}, -$C(O)R_{11}$, -$C(O)OR_{12}$, -$C(O)$-$(CH_2)_m$-$C(O)R_{11}$, -$OC(O)R_{11}$ and -$(CH_2)_m$-$N(R^c)C(O)R_{11}$, wherein the C_1-C_{12} alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, C_1-C_6 alkyl, OR_{12}, SR_{12}, -$C(O)R_{11}$, -$C(O)OR_{12}$, -$O(O)CR_{11}$, -$N(R^c)C(O)R^d$, -$O(CH_2)_mO(CH_2)_qR_{12}$, 5-7 membered heterocyclyl, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen and hydroxy;

R_{11} and R_{12} are each independently selected from the group consisting of hydrogen, halogen, hydroxy, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, C_1-C_6 alkyl, -OR^d, -$N(R^c)C(O)R^d$, C_6-C_{10} aryl and 5-10 membered heteroaryl;

R^a and R^b are each independently selected from the group consisting of hydrogen and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen;

or, R^a and R^b together with the atoms to which they are attached form a 5-7 membered heterocyclyl, wherein the 5-7 membered heterocyclyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, oxo and C_1-C_6 alkyl;

R^c and R^d are each independently selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, nitro and C_1-C_6 alkyl;

m is selected from an integer from 0 to 6;

q is selected from an integer from 0 to 6.

3. The compound of formula (II) according to claim 1,

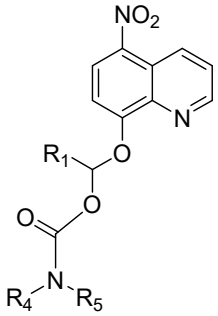
wherein,

any one of R_4, R_5 and R_6 is hydrogen, and the remaining two together with the carbon atom to which they are attached form a C_3-C_6 cycloalkyl or 5-7 membered heterocyclyl, wherein the C_3-C_6 cycloalkyl or 5-7 membered heterocyclyl is optionally further substituted by one or more substituent(s) selected from the group consisting of -C(O)R_{11} and -C(O)OR_{12};

R_{11} and R_{12} are each independently selected from the group consisting of hydrogen, halogen, hydroxy, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, C_1-C_6 alkyl, -OR^d, -N(R^c)C(O)R^d, C_6-C_{10} aryl and 5-10 membered heteroaryl;

R^c and R^d are each independently selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen and C_1-C_6 alkyl.

4. The compound of formula (II) according to claim 1, being a compound of formula (III),



(III)

wherein,

R_1 is selected from the group consisting of hydrogen and C_{1-6} alkyl;

R_4 and R_5 are each independently selected from the group consisting of hydrogen, C_1-C_{12} alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_{12} alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, C_1-C_6 alkyl, OR_{12}, SR_{12}, -C(O)R_{11}, -C(O)OR_{12}, -O(O)CR_{11}, -$(CH_2)_m$-OC(O)R_{11}, C_6-C_{10} aryl, C_6-C_{10} arylalkyl, 5-10 membered heteroaryl and 5-10 membered heteroarylalkyl; or

R_4, R_5 and N atom together form a 5-7 membered heterocyclyl, wherein the 5-7 membered heterocyclyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, hydroxy, thiol, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_3-C_6 cycloalkyl and 5-7 membered heterocyclyl;

R_{11} and R_{12} are each independently selected from the group consisting of hydrogen, halogen, hydroxy, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting

of halogen, nitro, thiol, C_1-C_6 alkyl, -OR^d, -$N(R^c)C(O)R^d$, -$C(O)N(R^a)(R^b)$, -$N(R^c)S(O)_pR^d$, -$S(O)_pN(R^a)(R^b)$, C_6-C_{10} aryl and 5-10 membered heteroaryl;

R^a and R^b are each independently selected from the group consisting of hydrogen and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen;

or, R^a and R^b together with the atoms to which they are attached form a 5-7 membered heterocyclyl, wherein the 5-7 membered heterocyclyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, oxo and C_1-C_6 alkyl;

R^c and R^d are each independently selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_1-C_6 alkoxy, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen and C_1-C_6 alkyl;

m is selected from an integer from 0 to 6;

p is selected from the group consisting of 0, 1 and 2.

5. The compound of formula (II) according to claim 4,

wherein,

R_4 and R_5 are each independently selected from the group consisting of hydrogen, C_1-C_{12} alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_{12} alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, hydroxy, thiol, C_1-C_6 alkyl, -$C(O)R_{11}$, -$C(O)OR_{12}$, -$O(O)CR_{11}$, -$(CH_2)_m$-$OC(O)R_{11}$, C_6-C_{10} aryl and 5-10 membered heteroaryl;

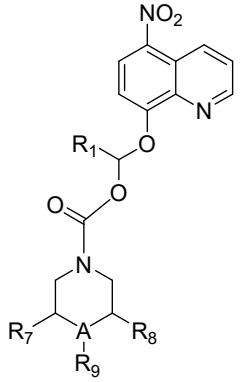
R_{11} and R_{12} are each independently selected from the group consisting of hydrogen and C_1-C_6 alkyl, wherein the C_1-C_6 alkyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, -OR^d and -$N(R^c)C(O)R^d$;

R^c and R^d are each independently selected from the group consisting of hydrogen, C_1-C_6 alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen and C_1-C_6 alkyl;

m is selected from an integer from 0 to 6;

p is selected from the group consisting of 0, 1 and 2.

6. A compound of formula (IV),



(IV)

or a mesomer, racemate, enantiomer, diastereomer thereof, or mixture thereof, or a pharmaceutically acceptable salt thereof,

wherein,

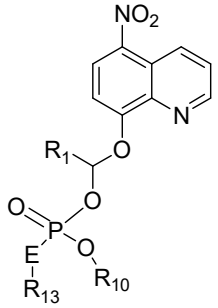
R_1 is selected from the group consisting of hydrogen and C_{1-6} alkyl;

A is selected from the group consisting of C, O and N;

R_7 and R_8 are each independently selected from the group consisting of hydrogen, halogen, hydroxy, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_1-C_6 haloalkyl and C_1-C_6 haloalkoxy;

R_9 is selected from the group consisting of hydrogen, halogen, amino, hydroxy, thiol, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_3-C_6 cycloalkyl and 5-7 membered heterocyclyl.

7. A compound of formula (V),



(V)

or a mesomer, racemate, enantiomer, diastereomer thereof, or mixture thereof, or a pharmaceutically acceptable salt thereof,

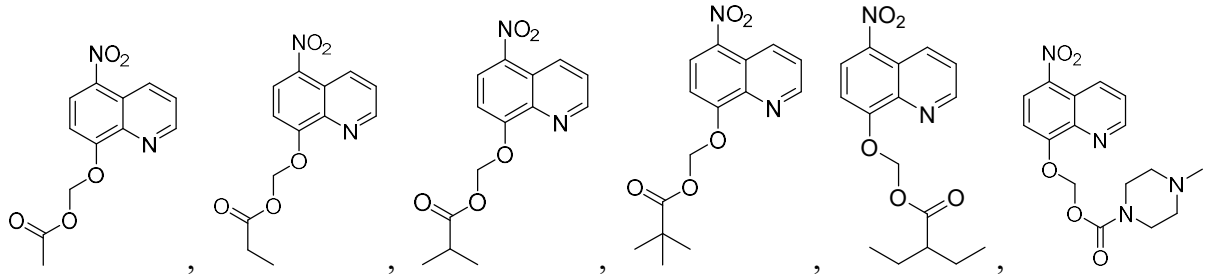
wherein,

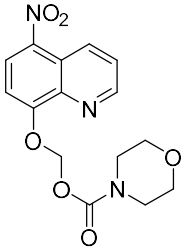
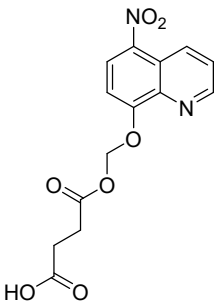
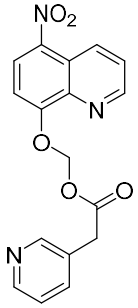
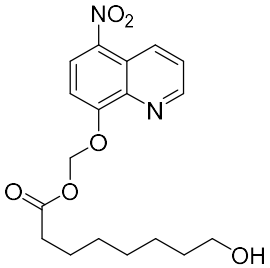
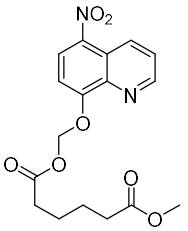
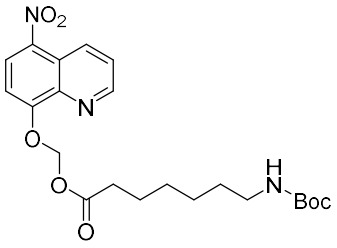
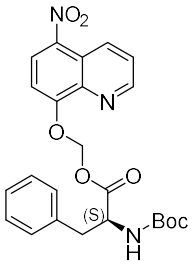
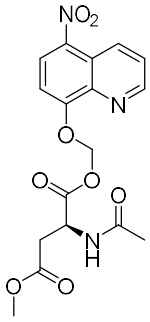
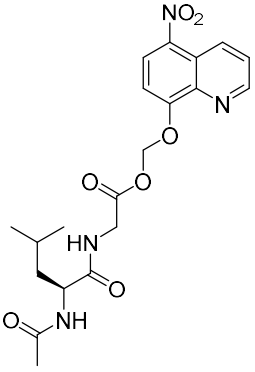
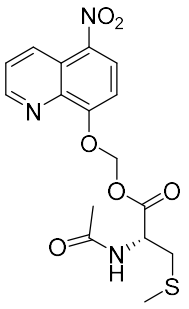
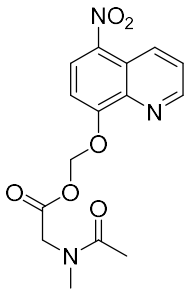
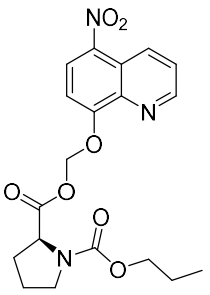
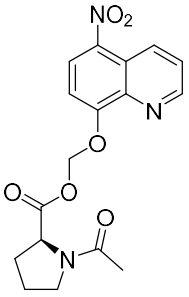
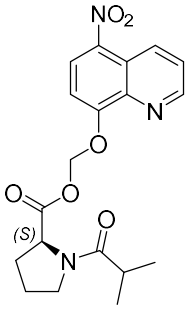
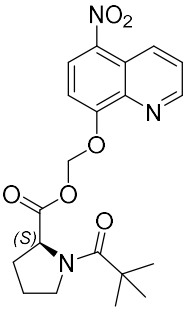
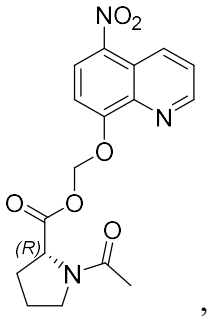
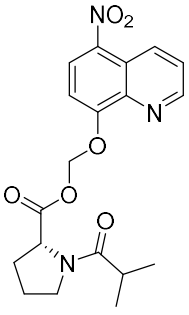
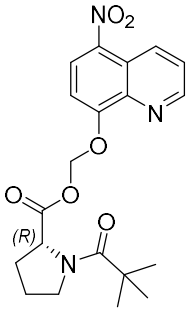
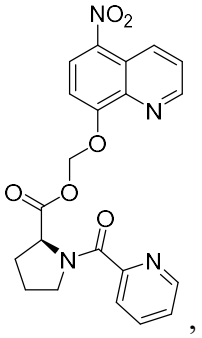
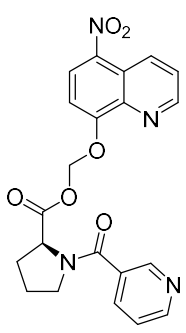
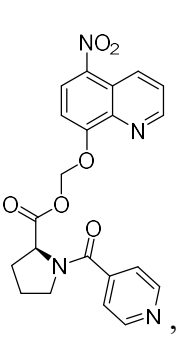
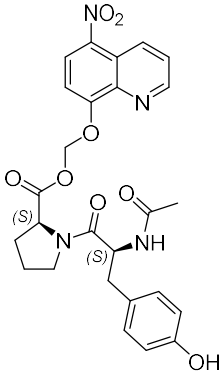
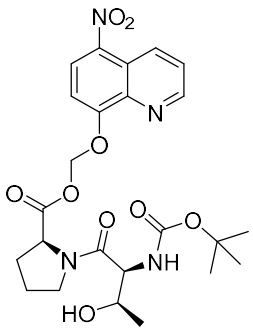
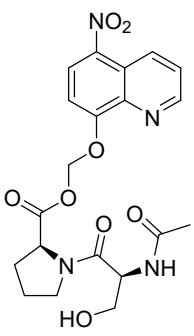
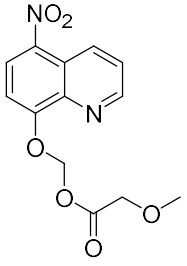
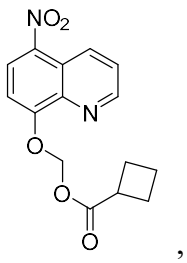
E is selected from the group consisting of O and NR_{14};

R_{10}, R_{13} and R_{14} are each independently selected from the group consisting of hydrogen, C_{1-6} alkyl and C_6-C_{10} aryl, wherein the C_{1-6} alkyl is optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, C_6-C_{10} aryl, C_6-C_{10} arylalkyl, 5-10 membered heteroaryl, 5-10 membered heteroarylalkyl, -OR_{12}, -COR_{11}, -$C(O)OR_{12}$, -$OC(O)R_{11}$ and -$OC(O)OR_{12}$;

R_{11} and R_{12} are each independently selected from the group consisting of C_1-C_6 alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl, wherein the C_1-C_6 alkyl, C_6-C_{10} aryl and 5-10 membered heteroaryl are optionally further substituted by one or more substituent(s) selected from the group consisting of halogen, nitro, hydroxy, thiol, C_1-C_6 alkyl and C_1-C_6 alkoxy.

8. A compound selected from the group consisting of:




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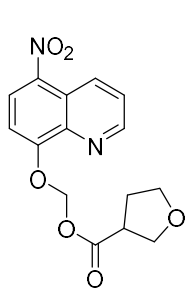
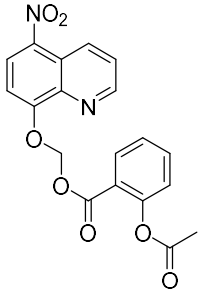
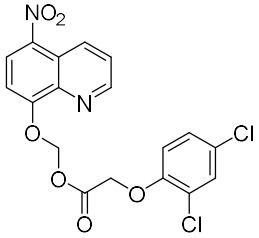
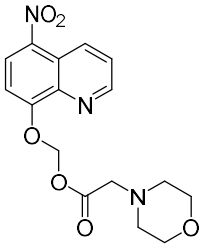
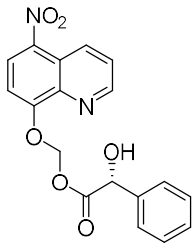
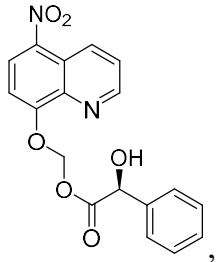
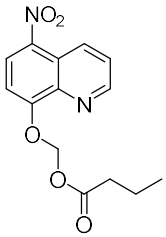
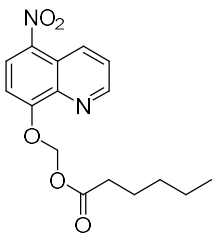
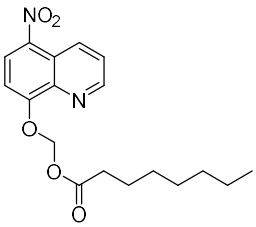
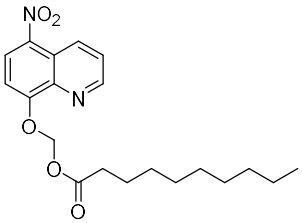
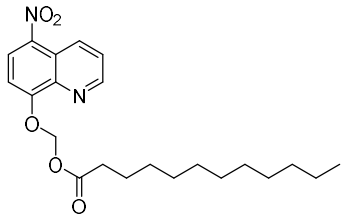
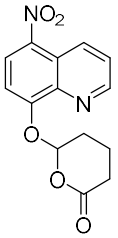
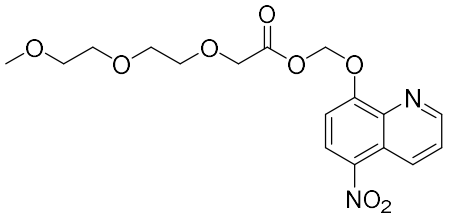
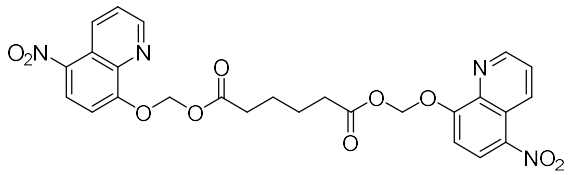
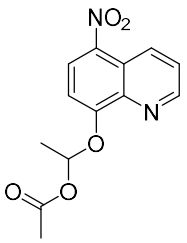
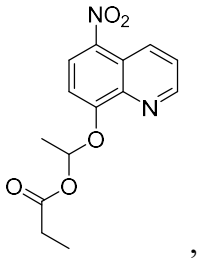
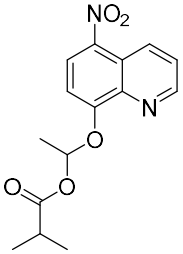
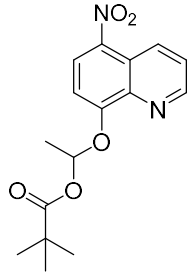
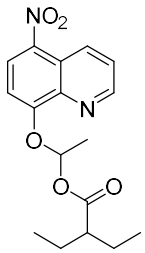
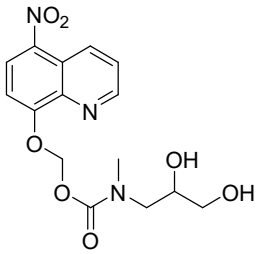
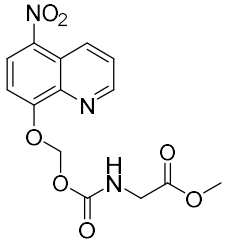
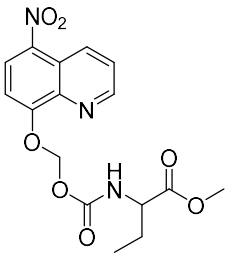
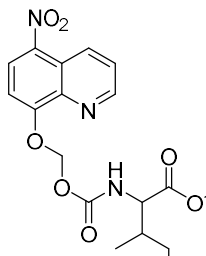
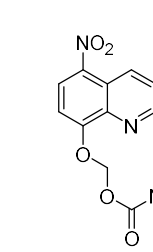
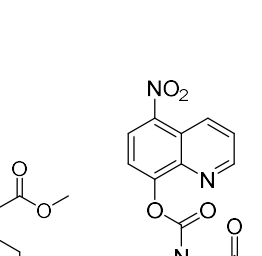
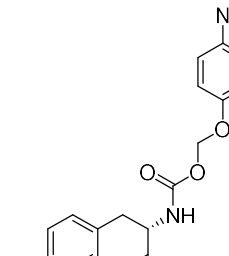
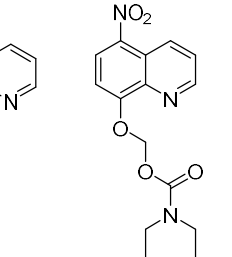
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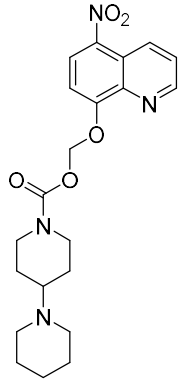
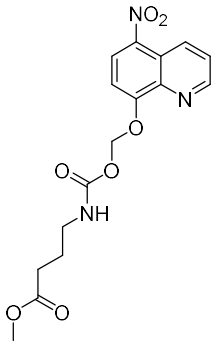
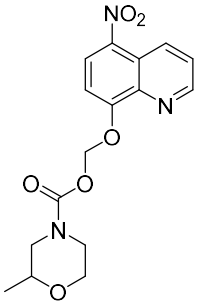
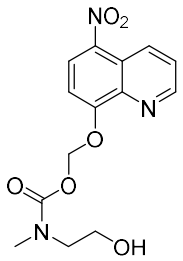
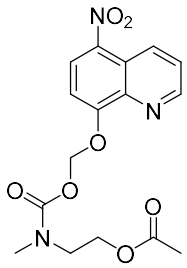
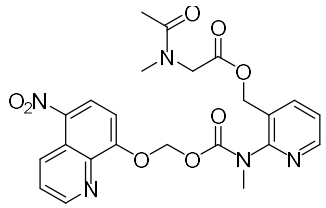
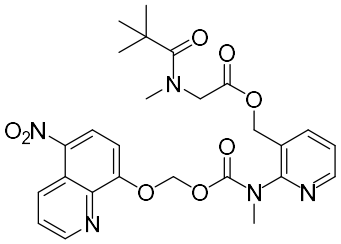
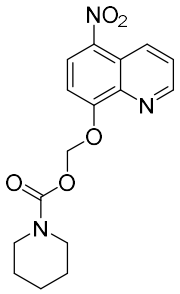
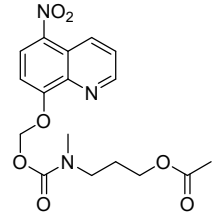
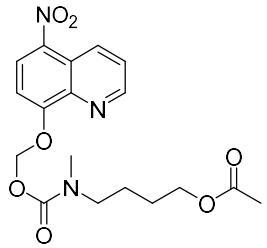
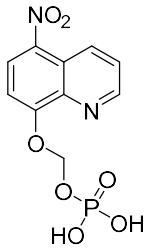
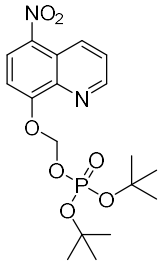
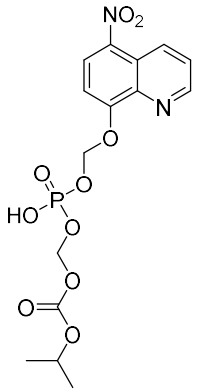
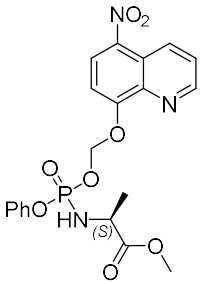
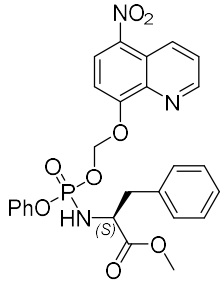
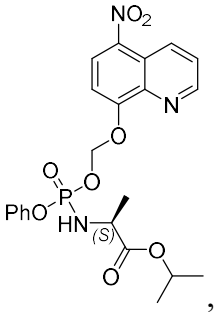
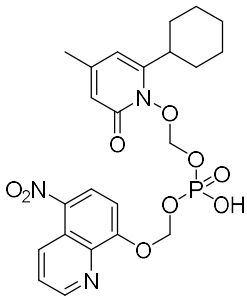
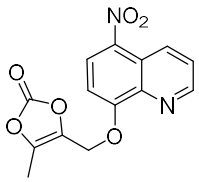
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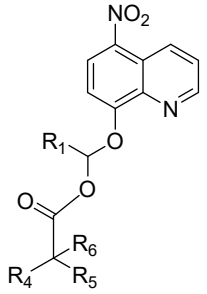
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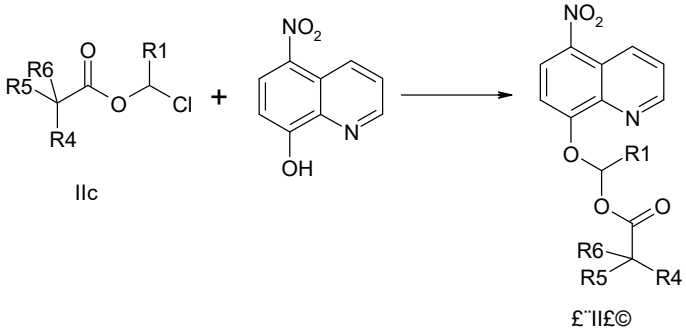
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9. A method for preparing a compound of formula (II) or a mesomer, racemate, enantiomer, diastereomer thereof, or mixture thereof, or a pharmaceutically acceptable salt thereof,



(II)

comprising a step of:



IIc

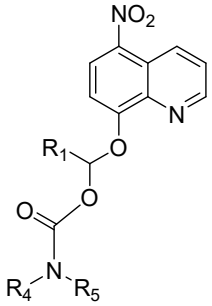
£¨II£©

subjecting compound IIc and nitroxoline to a nucleophilic reaction in a solvent in the presence of an alkali to obtain the compound of formula (II);

R_1, R_4, R_5 and R_6 are as defined in claim 1.

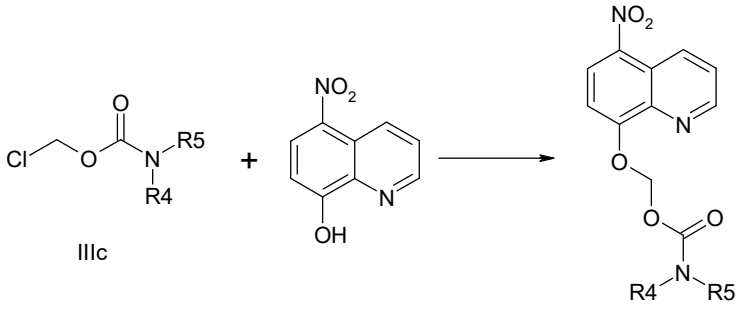
10. The method according to claim 9, wherein the alkali is selected from the group consisting of potassium carbonate, sodium carbonate, potassium bicarbonate, sodium bicarbonate, triethylamine and pyridine; the solvent is selected from the group consisting of dichloromethane, N,N-dimethylformamide, tetrahydrofuran and *tert*-butyl methyl ether;

11. A method for preparing a compound of formula (III) or a mesomer, racemate, enantiomer, diastereomer thereof, or mixture thereof, or a pharmaceutically acceptable salt thereof,



(III)

comprising a step of:



IIIc

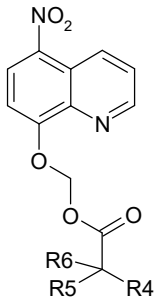
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subjecting compound IIIc and nitroxoline to a nucleophilic reaction in a solvent in the presence of an alkali to obtain the compound of formula (III);

R_4 and R_5 are as defined in claim 4.

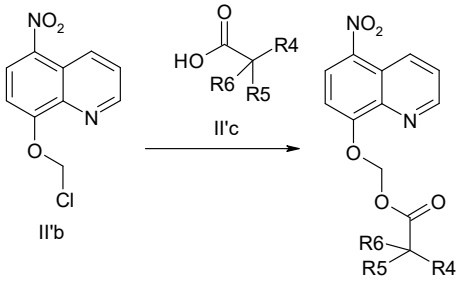
12. The method according to claim 11, wherein the alkali is selected from the group consisting of potassium carbonate, sodium carbonate, potassium bicarbonate, sodium bicarbonate, triethylamine and pyridine; the solvent is selected from the group consisting of dichloromethane, N,N-dimethylformamide, tetrahydrofuran and *tert*-butyl methyl ether.

13. A method for preparing a compound of formula (II') or a mesomer, racemate, enantiomer, diastereomer thereof, or mixture thereof, or a pharmaceutically acceptable salt thereof,



(II')

comprising a step of:



II'b

II'c

£¨II')

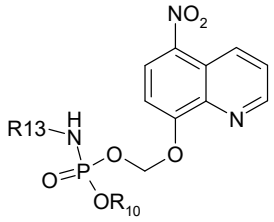
subjecting compound II'b and compound II'c to a nucleophilic reaction in a solvent in the presence of an alkali to obtain the compound of formula (II');

R_4, R_5 and R_6 are as defined in claim 1.

14. The method according to claim 13, wherein the alkali is selected from the group

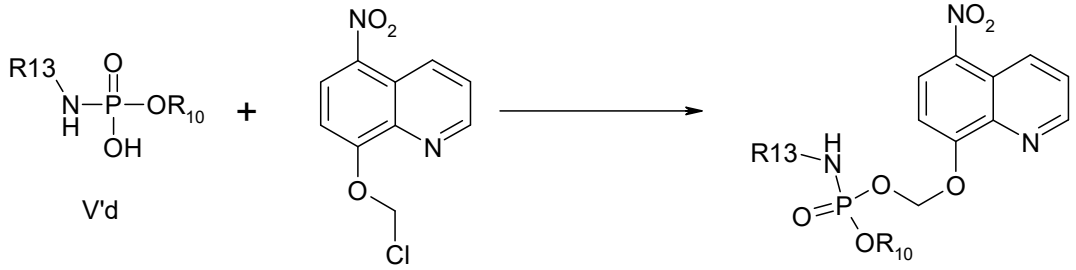
consisting of potassium carbonate, sodium carbonate, potassium bicarbonate, sodium bicarbonate, triethylamine and pyridine; the solvent is selected from the group consisting of dichloromethane, N,N-dimethylformamide, tetrahydrofuran and *tert*-butyl methyl ether.

15. A method for preparing a compound of formula (V') or a mesomer, racemate, enantiomer, diastereomer thereof, or mixture thereof, or a pharmaceutically acceptable salt thereof,



(V')

comprising a step of:



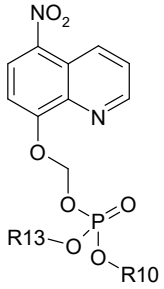
V'd II'b £¨V'£©

subjecting compound V'd and compound II'b to a nucleophilic reaction in a solvent in the presence of an alkali to obtain the compound of formula (V');

R_{10} and R_{13} are as defined in claim 7.

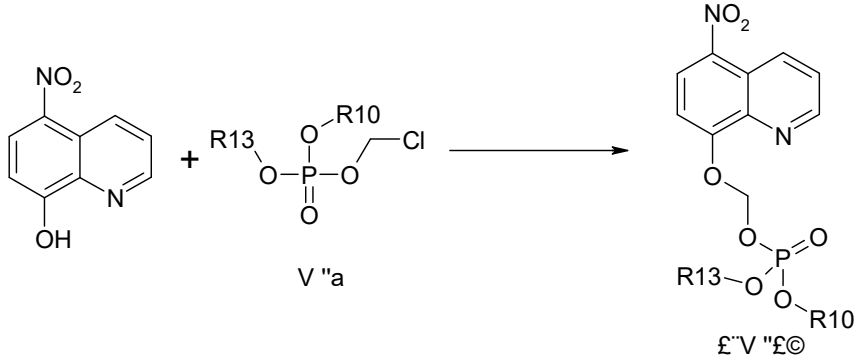
16. The method according to claim 15, wherein the alkali is selected from the group consisting of potassium carbonate, sodium carbonate, potassium bicarbonate, sodium bicarbonate, triethylamine and pyridine; the solvent is selected from the group consisting of dichloromethane, N,N-dimethylformamide, tetrahydrofuran and *tert*-butyl methyl ether.

17. A method for preparing a compound of formula (V'') or a mesomer, racemate, enantiomer, diastereomer thereof, or mixture thereof, or a pharmaceutically acceptable salt thereof,



(V'')

comprising a step of:



subjecting compound V''a and nitroxoline to a nucleophilic reaction in a solvent in the presence of an alkali to obtain the compound of formula (V'');

R_{10} and R_{13} are as defined in claim 7.

18. The method according to claim 17, wherein the alkali is selected from the group consisting of potassium carbonate, sodium carbonate, potassium bicarbonate, sodium bicarbonate, triethylamine and pyridine; the solvent is selected from the group consisting of dichloromethane, N,N-dimethylformamide, tetrahydrofuran and *tert*-butyl methyl ether.

19. A pharmaceutical composition, comprising the compound according to any one of claims 1 to 8 or the pharmaceutically acceptable salt thereof and at least one pharmaceutically acceptable carrier.

20. Use of the compound according to any one of claims 1 to 8 or the pharmaceutically acceptable salt thereof or the pharmaceutical composition according to claim 19 in the preparation of an anti-infective medicament or anti-tumor medicament.

21. The use according to claim 20, wherein the tumor is selected from the group consisting of bladder cancer, prostate cancer and kidney cancer.