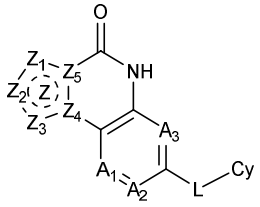
WHAT IS CLAIMED IS:

1. A compound of Formula I:



(I)

or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, wherein:

A_1, A_2 and A_3 are each independently selected from N and CR_1;

the Z ring shown as  is an optionally substituted 5 membered heteroaryl group, an optionally substituted 5 membered carbocyclic group or an optionally substituted 5 membered heterocyclic group, * indicates the position at which the Z ring is attached to the rest of the compound, the dashed lines indicate optional presence of unsaturated bond(s), wherein, when the Z ring is an optionally substituted 5 membered heteroaryl group, Z_1, Z_2 and Z_3 are each independently CR_2, NR_3, O, N or S, Z_4 and Z_5 are each independently C or N, wherein Z_4 and Z_5 are not N at the same time; when the Z ring is an optionally substituted 5 membered carbocyclic group or an optionally substituted 5 membered heterocyclic group, Z_1, Z_2 and Z_3 are each independently CR_2R_2', CR_2, NR_3, O or S, Z_4 and Z_5 are each independently C, CH or N; and

when Z_5 is N, at least one of Z_1, Z_2 and Z_3 is N, or when Z_5 is N and all of Z_1, Z_2 and Z_3 are CR_2 or CR_2R_2', A_1 is CR_1;

L is selected from a bond and an alkylene optionally substituted by R_4 and/or R_5;

Cy is selected from a group consisting of an optionally substituted heterocyclic group, an optionally substituted aryl, and an optionally substituted heteroaryl;

R_1 is selected from a group consisting of hydrogen, halogen, an optionally substituted alkyl, an optionally substituted alkoxy and an optionally substituted carbocyclic group;

R_2 and R_2' are each independently selected from a group consisting of hydrogen, hydroxyl, halogen, cyano, an optionally substituted alkyl, an optionally substituted alkoxy, an optionally substituted cycloalkyl, an optionally substituted alkenyl, and an optionally substituted alkynyl;

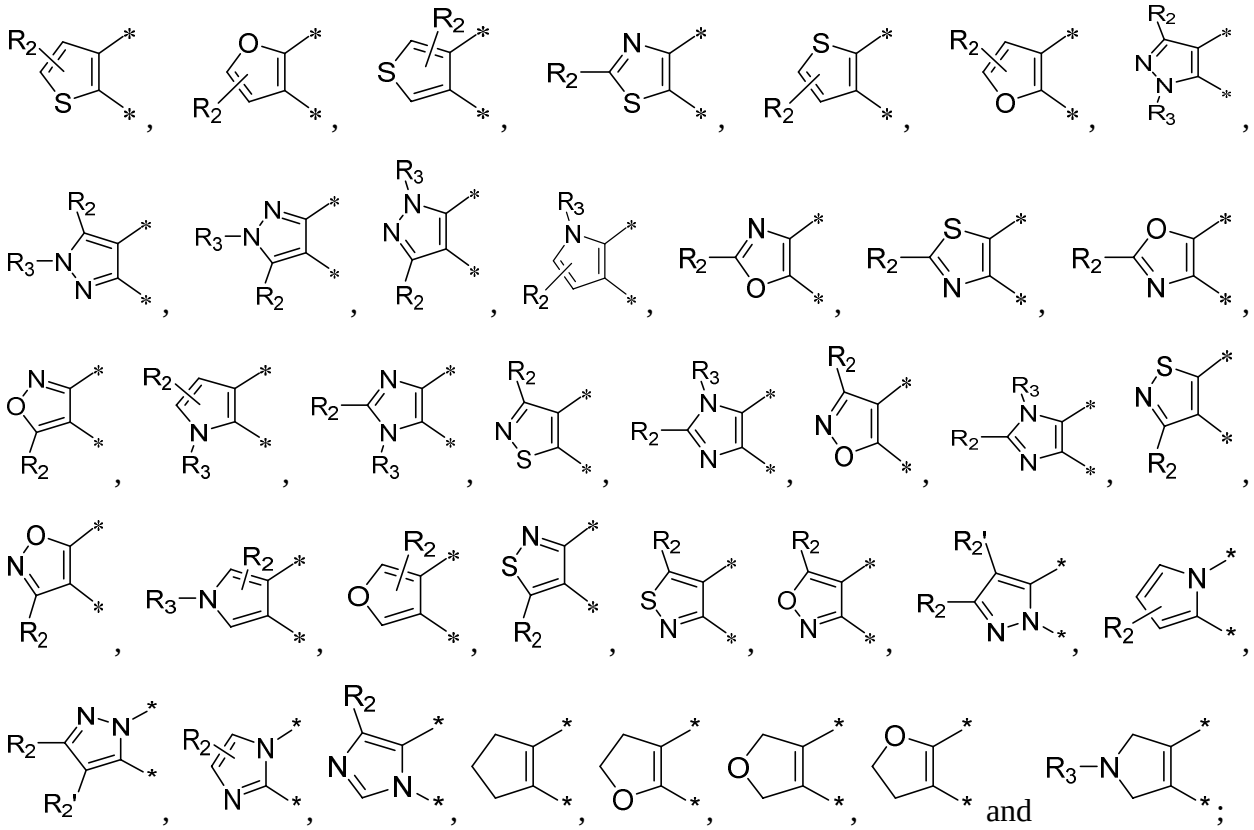
R_3 is selected from a group consisting of hydrogen, an optionally substituted alkyl and an optionally substituted cycloalkyl;

R_4 and R_5 are each independently selected from a group consisting of halogen, cyano, an optionally substituted alkyl, an optionally substituted alkoxy, an optionally substituted cycloalkyl, an optionally substituted alkenyl, and an optionally substituted alkynyl; or R_4 and R_5 together with the attached C form a ring.

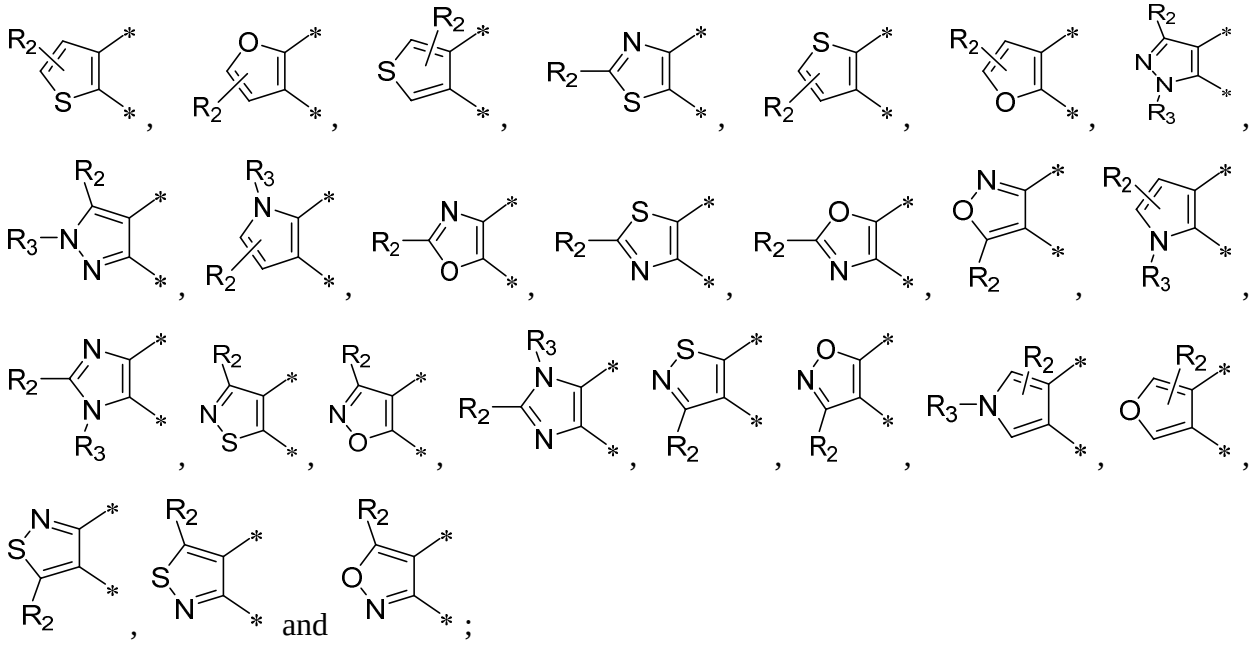
2. The compound of claim 1, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, wherein:

R_1 is hydrogen, halogen, an optionally substituted C_{1-3} alkyl or an optionally substituted C_{1-3} alkoxy; preferably, R_1 is hydrogen, halogen or C_{1-3} alkyl; preferably, at least one of A_1 and A_3 is CR_1, and R_1 is halogen, such as fluoro; or at least one of A_2 and A_3 is CR_1, and R_1 is halogen; or both A_2 and A_3 are CR_1, and at least one of the R_1 groups is halogen; or A_3 is CR_1, R_1 is halogen; or all of A_1, A_2 and A_3 are CR_1, wherein each R_1 is independently hydrogen, halogen or C_{1-3} alkyl; or at least one of A_1 and A_3 is CR_1, wherein R_1 is halogen, preferably at least A_3 is CR_1 and R_1 is a halogen such as fluoro； or A_1 is CR_1, both of A_2 and A_3 are CH; or A_1 is CH, A_2 is CR_1, A_3 is CH; or both of A_1 and A_2 are CH, A_3 is CR_1, wherein R_1 is halogen or C_{1-3} alkyl; and/or

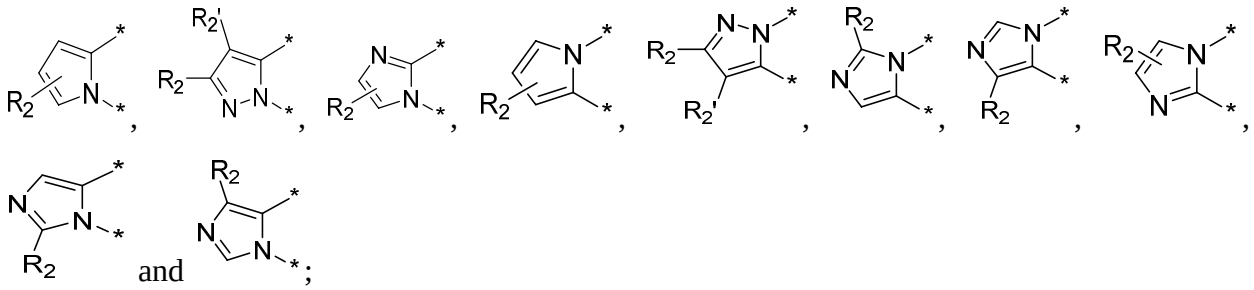
the Z ring is selected from the following groups:


and

preferably,


and

more preferably,


and

;

wherein * indicates the position at which the Z ring is attached to the rest of the compound; R_2 is selected from hydrogen, halogen, cyano, an optionally substituted C_{1-6} alkyl, an optionally substituted C_{1-3} alkoxy and an optionally substituted C_{3-6} cycloalkyl, preferably hydrogen, halogen and an optionally substituted C_{1-3} alkyl; R_2' is selected from hydrogen, halogen, cyano, an optionally substituted C_{1-6} alkyl, an optionally substituted C_{1-3} alkoxy and an optionally substituted C_{3-6} cycloalkyl, preferably hydrogen, halogen and an optionally substituted C_{1-3} alkyl; R_3 is selected from a group consisting of hydrogen, an optionally substituted alkyl and an optionally substituted cycloalkyl, preferably hydrogen and an optionally substituted C_{1-3} alkyl; and/or

L is C_{1-3} alkylene; and/or

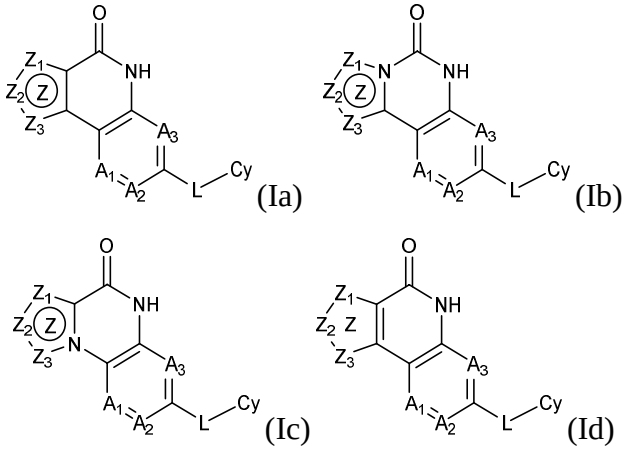
Cy is a 5-7 membered nitrogen-containing heterocyclic group optionally substituted by 1-5 substituents selected from a group consisting of halogen, C_{1-4} alkyl, C_{1-4} alkoxy, halogenated C_{1-4} alkyl, halogenated C_{1-4} alkoxy, an optionally substituted 6-14 membered aryl, an optionally substituted 5-10 membered heteroaryl, an optionally substituted 4-10 membered heterocyclic group and an optionally substituted C_{3-8} cycloalkyl, wherein the said 6-14 membered aryl, 5-10 membered heteroaryl, 4-10 membered heterocyclic group and C_{3-8} cycloalkyl each can be independently substituted by 1-5 substituents selected from a group consisting of halogen, C_{1-4} alkyl, C_{1-4} alkoxy, halogenated C_{1-4} alkyl, halogenated C_{1-4} alkoxy, -NR'R", -C(O)-NR'R" and carboxyl, wherein the said R' and R" each are preferably independently H, an optionally substituted C_{1-10} alkyl, an optionally substituted C_{3-8} cycloalkyl, an optionally substituted 3-6 membered heterocyclic group, an optionally substituted aryl or an optionally substituted heteroaryl, preferably R' and R" each are preferably independently H, an optionally substituted C_{1-4} alkyl, an optionally substituted C_{3-8} cycloalkyl or an optionally substituted 3-6 membered heterocyclic group;

preferably, the substituents on 6-14 membered aryl, 5-10 membered heteroaryl, 4-10 membered heterocyclic group and C_{3-8} cycloalkyl include at least an -C(O)-NR'R", and optionally include one or two of substituents selected from a group consisting of halogen, C_{1-4} alkyl and halogenated C_{1-4} alkyl;

preferably, Cy is substituted by an optionally substituted 5-10 membered heteroaryl, preferably an optionally substituted 5-10 membered nitrogen-containing heteroaryl, preferably, the 5-10 membered heteroaryl or 5-10 membered nitrogen-containing heteroaryl is at least substituted by an -C(O)-NR'R", and optionally substituted by one or two substituents selected from a group consisting of halogen, C_{1-4} alkyl and halogenated C_{1-4} alkyl, further preferably, the -C(O)-NR'R" is at the para position;

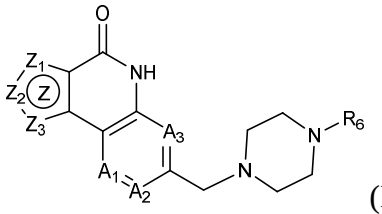
preferably, Cy is piperazinyl or dihyropyridinyl substituted with an optionally substituted pyridyl, and the said pyridyl is at least substituted with an -C(O)-NR'R"; and Cy is covalently linked to L through its ring nitrogen atom.

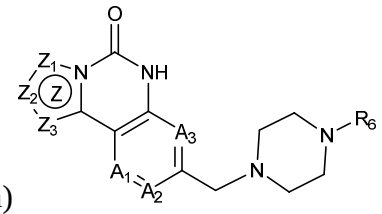
3. The compound of any one of claims 1-2, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, wherein the compound of Formula I is represented by Formulae Ia, Ib, Ic or Id as shown below:

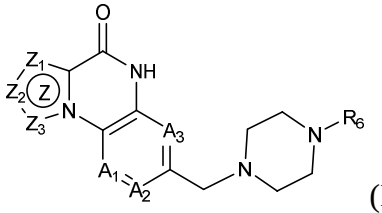


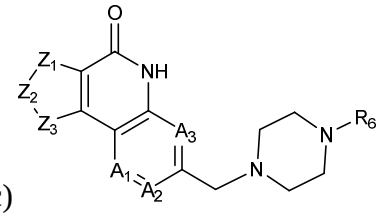
wherein, A_1, A_2, A_3, Z ring, L and Cy are as defined in any one of claims 1-2; or

the said compounds of Formula I are represented by Formulae IIa, IIb, IIc or IId:


(IIa)


(IIb)


(IIc)


(IId)

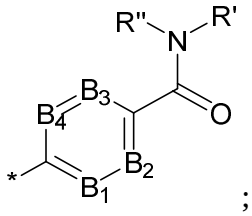
wherein, A_1, A_2, A_3 and Z ring are as defined in any one of claims 1-2; R_6 is selected from an optionally substituted aryl and an optionally substituted heteroaryl.

4. The compound of claim 3, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, wherein:

R_6 is an optionally substituted 6-14 membered aryl or an optionally substituted 5-10 membered heteroaryl, wherein the said optionally substituted 6-14 membered aryl and optionally substituted 5-10 membered heteroaryl each can be independently substituted by 1-5 substituents selected from a group consisting of halogen, C_{1-4} alkyl, C_{1-4} alkoxy, halogenated C_{1-4} alkyl, halogenated C_{1-4} alkoxy, -NR'R", -C(O)-NR'R" and carboxyl; wherein the said R' and R" each are preferably independently H, an optionally substituted C_{1-10} alkyl, an optionally substituted C_{3-8} cycloalkyl, an optionally substituted heterocyclic group, an optionally substituted aryl or an optionally substituted heteroaryl; preferably R' and R" each are preferably independently H, an optionally substituted C_{1-4} alkyl, an optionally substituted C_{3-6} cycloalkyl or an optionally substituted 3-6 membered heterocyclic group; preferably, the substituents of R_6 include at least an -C(O)-NR'R", and optionally include one or two of substituents selected from a group consisting of halogen, C_{1-4} alkyl and halogenated C_{1-4} alkyl; preferably, R_6 is an optionally substituted 5-10 membered heteroaryl, preferably an optionally substituted 5-10 membered nitrogen-containing

heteroaryl, preferably, the 5-10 membered heteroaryl or 5-10 membered nitrogen-containing heteroaryl is at least substituted by an -C(O)-NR'R", and optionally substituted by one or two substituents selected from a group consisting of halogen, C_{1-4} alkyl or halogenated C_{1-4} alkyl;

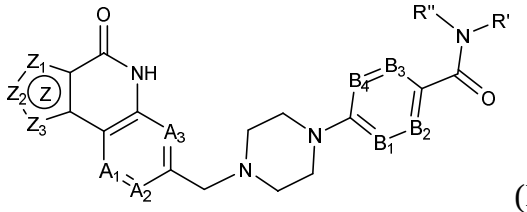
preferably, R_6 is preferably the following group:



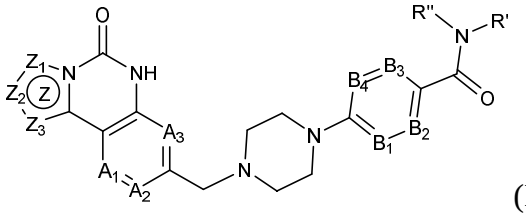
;

wherein, B_1, B_2, B_3 and B_4 are independently selected from a group consisting of N and CR_7; R_7 is selected from a group consisting of hydrogen, halogen, an optionally substituted alkyl, an optionally substituted alkoxy, an optionally substituted carbocyclic group, an optionally substituted alkenyl and an optionally substituted alkynyl; wherein R' and R" each are independently hydrogen, an optionally substituted C_{1-10} alkyl, an optionally substituted C_{3-8} cycloalkyl, an optionally substituted heterocyclic group, an optionally substituted aryl or an optionally substituted heteroaryl, preferably, R' and R" each are independently hydrogen, an optionally substituted C_{1-4} alkyl, an optionally substituted C_{3-6} cycloalkyl or an optionally substituted 3-6 membered heterocyclic group; * indicates the position at which the said group is attached to the rest of the compound; preferably, the group containing B_1, B_2, B_3 and B_4 is phenyl, pyridyl, pyrimidinyl or pyridazinyl; preferably, R_7 is H, halogen, C_{1-3} alkyl, C_{1-3} alkoxy or halogenated C_{1-3} alkyl; preferably, B_3 is N, B_4 is CR_7, both of B_1 and B_2 are CH, wherein R_7 is H, halogen, C_{1-3} alkyl, C_{1-3} alkoxy or halogenated C_{1-3} alkyl; R' is hydrogen, R" is hydrogen, C_{1-3} alkyl, deuterated C_{1-3} alkyl, C_{3-6} cycloalkyl or halogenated C_{1-3} alkyl.

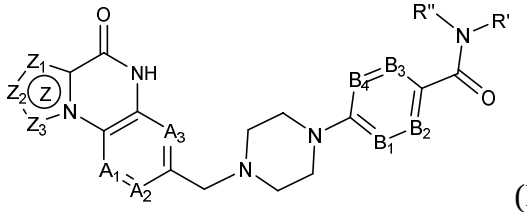
5. The compound of claim 1, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, wherein the compound of Formula I is represented by Formulae IIIa, IIIb, IIIc or IIId as shown below:



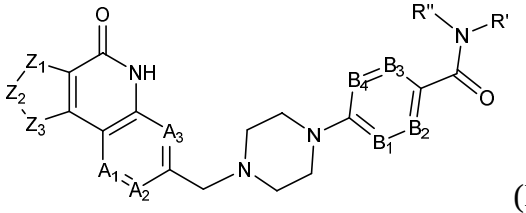
(IIIa)



(IIIb)



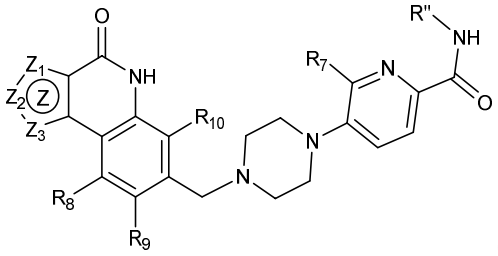
(IIIc)



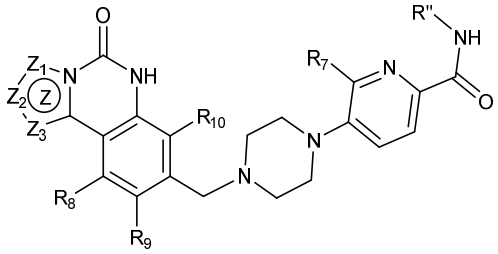
(IIId)

wherein, Z ring, A_1, A_2 and A_3 are as defined in any one of claims 1-2; B_1, B_2, B_3, B_4, R′ and R″ are as defined in claim 4.

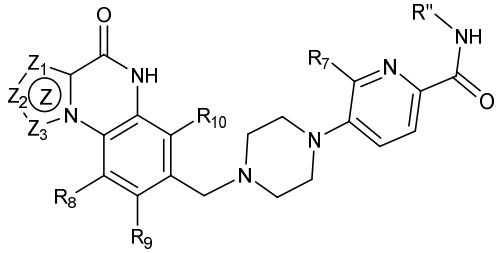
6. The compound of claim 1, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, wherein the compound of Formula I is represented by Formulae IVa, IVb, IVc or IVd as shown below:



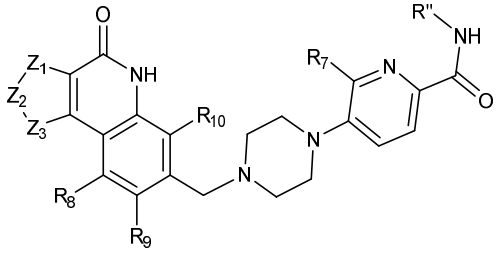
(IVa)



(IVb)



(IVc)



(IVd)

wherein, Z ring is as defined in claim 1 or 2, R″ is as defined in claim 2 or 4; R_7 is as defined in claim 4;

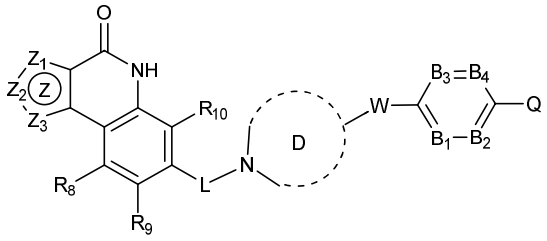
R_8, R_9 and R_{10} are independently selected from hydrogen, halogen, optionally substituted alkyl, optionally substituted alkoxy and optionally substituted carbocyclic group;

preferably, R_8, R_9 and R_{10} are each independently hydrogen, halogen or C_{1-3} alkyl or optionally substituted C_{1-3} alkoxy; preferably, R_8, R_9 and R_{10} are each independently hydrogen, halogen or C_{1-3} alkyl; preferably, R_8 is halogen or C_{1-3} alkyl, both of R_9 and R_{10} are H; or R_8 is H, R_9 is halogen or C_{1-3} alkyl, R_{10} is H; or both of R_8 and R_9 are H, R_{10} is halogen or C_{1-3} alkyl;

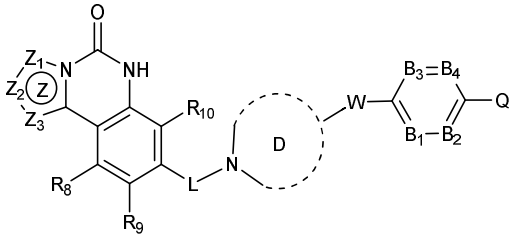
preferably, at least one of R_9 and R_{10} is halogen.

7. The compound of claim 1, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof,

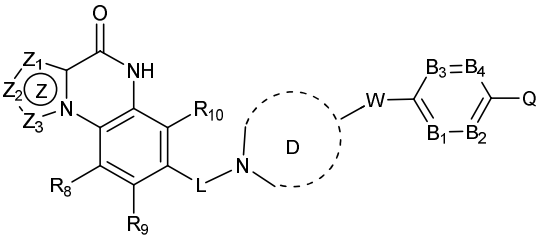
or mixtures thereof, wherein the compound of Formula I is represented by Formulae Va, Vb, Vc or Vd as shown below:



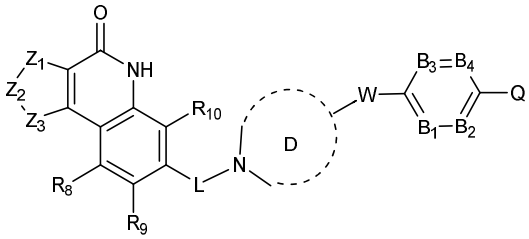
(Va)



(Vb)



(Vc)



(Vd)

wherein, Z_1, Z_2 and Z_3 are as defined in any one of claims 1-2; R_8, R_9 and R_{10} are as defined in claim 6; B_1, B_2, B_3 and B_4 are as defined in claim 4;

the D ring is an optionally substituted 4 to 12 membered N-containing heterocyclic group; the said N-containing heterocyclic group containing at least 1 N atom is selected from 4-12 membered monocyclic group, 5-12 membered spirocyclic group, the said N-containing heterocyclic group can also include 1-4 heteroatoms selected from N, O or S, and can be optionally further substituted by 1 or more R'";

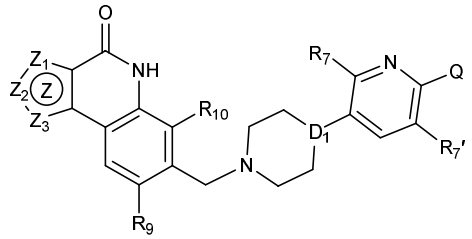
W is a bond, O or -NR'-;

Q is an optionally substituted aminoacyl (-C(O)-NR'R") or an optionally substituted heteroaryl;

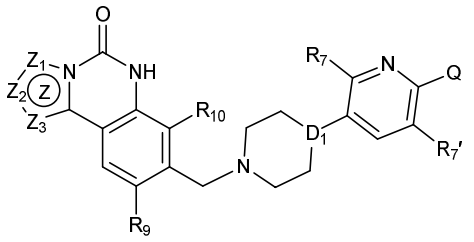
R' and R" are each independently selected from hydrogen, optionally substituted C_{1-10} alkyl, optionally substituted cycloalkyl, optionally substituted heterocyclic group, optionally substituted aryl and optionally substituted heteroaryl;

R'" is selected from halogen, hydroxyl, cyano or C_{1-6} alkyl, and the said C_{1-6} alkyl is optionally further substituted by one or more substituents selected from hydroxyl, halogen or cyano; or any two R'" can form a 3-8 membered ring.

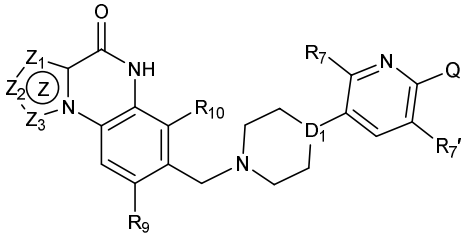
8. The compound of claim 1, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, wherein the compound of Formula I is represented by Formulae VIa, VIb or VIc as shown below:



(VIa)



(VIb)



(VIc)

wherein, Z_1, Z_2 and Z_3 are as defined in any one of claims 1-2; R_7 and Q are as defined in claim 7;

R_7' is hydrogen, halogen, cyano, optionally substituted C_{1-3} alkyl, optionally substituted C_{1-3} alkoxy or optionally substituted C_{3-6} cycloalkyl;

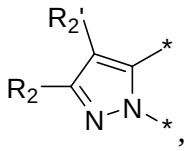
R_9 and R_{10} are each independently hydrogen, halogen, optionally substituted C_{1-3} alkyl, or optionally substituted C_{1-3} alkoxy, and at least one of R_9 and R_{10} is not hydrogen;

D_1 is N or CR_{11};

R_{11} is H, halogen, cyano, hydroxyl, optionally substituted C_{1-3} alkyl or optionally substituted C_{1-3} alkoxy.

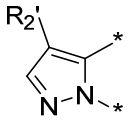
9. The compound of any one of claims 6-8, wherein:

Z ring is:



wherein, R_2 is selected from hydrogen, halogen, cyano, optionally substituted alkyl, optionally substituted C_{1-3} alkoxy and optionally substituted C_{3-6} cycloalkyl, preferably hydrogen, halogen, cyano, optionally substituted C_{1-3} alkyl and optionally substituted C_{3-6} cycloalkyl; R_2' is selected from hydrogen, halogen, cyano, optionally substituted C_{1-6} alkyl, optionally substituted C_{1-3} alkoxy and optionally substituted C_{3-6} cycloalkyl, preferably hydrogen, halogen, cyano, optionally substituted C_{1-3} alkyl or C_{3-6} cycloalkyl; moreover, at least one of R_2 and R_2' are non-hydrogen substituent, preferably, the non-hydrogen substituent is halogen, cyano, C_{1-3} alkyl or C_{3-6} cycloalkyl; and in Formulae IVa-IVd and Va-Vd, one of R_8, R_9 and R_{10} is halogen or C_{1-3} alkyl, the other two are hydrogen, and in Formulae VIa-VId, one of R_9 and R_{10} is halogen or C_{1-3} alkyl, the other one is hydrogen; or

Z ring is:



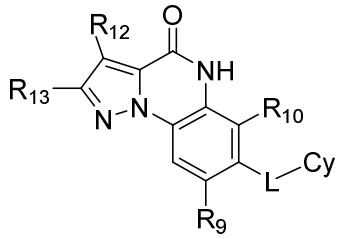
wherein, R_2' is selected from halogen, cyano, optionally substituted C_{1-6} alkyl, optionally substituted C_{1-3} alkoxy and optionally substituted C_{3-6} cycloalkyl, preferably halogen, cyano and optionally substituted C_{1-3} alkyl and optionally substituted C3-6 cycloalkyl; and in Formulae IVa-IVd and Va-Vd, R_8 is H, one of R_9 and R_{10} is halogen or C_{1-3} alkyl, the other one is hydrogen, and in Formulae VIa-VId, one of R_9 and R_{10} is halogen or C_{1-3} alkyl, the other one is hydrogen.

10. The compound of claim 8, wherein:

in Formula VIa, one of Z_1, Z_2 and Z_3 is O, the other two are CR_1, wherein, R_1 is selected from hydrogen, halogen and C_{1-3} alkyl; preferably, Z_1 is O, both of Z_2 and Z_3 are CH; preferably, R_9 is non-hydrogen substituent, such as halogen, optionally substituted C_{1-3} alkyl or optionally substituted C_{1-3} alkoxy, preferably halogen, more preferably F; preferably, R_{10} is hydrogen, halogen or C_{1-3} alkyl, preferably hydrogen; D_1 is N or CH; R_7 is hydrogen, C_{1-3} alkyl, halogenated C_{1-3} alkyl, halogen, cyano or C_{3-6} cycloalkyl, preferably hydrogen or halogen; preferably, Q is -C(O)-NR′R″ or pyrrolyl, pyrazolyl, imidazolyl or triazolyl optionally substituted by 1-2 groups selected from halogen and C_{1-3} alkyl, wherein R' and R" are each independently selected from hydrogen, C_{1-4} alkyl, C_{3-6} cycloalkyl or 3-6 heterocyclic group; or

in Formula VIa, one of Z_1, Z_2 and Z_3 is O, the other two are CR_1, preferably, Z_1 is O, both of Z_2 and Z_3 are CH; R_1 is selected from hydrogen, halogen and C_{1-3} alkyl; R_{10} is non-hydrogen substituent, such as halogen, optionally substituted C_{1-3} alkyl or optionally substituted C_{1-3} alkoxy, preferably halogen, more preferably F; R_9 is hydrogen, halogen or C_{1-3} alkyl, preferably hydrogen; D_1 is N or CH; R_7 is hydrogen, C_{1-3} alkyl, halogenated C_{1-3} alkyl, halogen, cyano or C_{3-6} cycloalkyl, preferably hydrogen, halogen, C_{1-3} alkyl or halogenated C_{1-3} alkyl; R_7' is hydrogen, C_{1-3} alkyl, halogenated C_{1-3} alkyl, halogen, cyano or C_{3-6} cycloalkyl, preferably hydrogen or halogen; Q is -C(O)-NR′R″ or pyrrolyl, pyrazolyl, imidazolyl or triazolyl optionally substituted by 1-2 groups selected from halogen and C_{1-3} alkyl, wherein, R' and R" are each independently selected from hydrogen, C_{1-4} alkyl, C_{3-6} cycloalkyl or 3-6 heterocyclic group; preferably, compounds where R_9 is H, R_{10} is F, R_7 is methyl, D_1 is N, R_7' is H, Q is -C(O)-NH(CH_3) or -C(O)-NH(CD_3) and compounds where R_9 is H, R_{10} is F, R_7 is F, D_1 is N, R_7' is H, Q is -C(O)-NH(CH_3) or -C(O)-NH(CD_3) are not included in formula VIa.

11. The compound of claim 1, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, wherein the compound of Formula I is represented by Formulae VII as shown below:

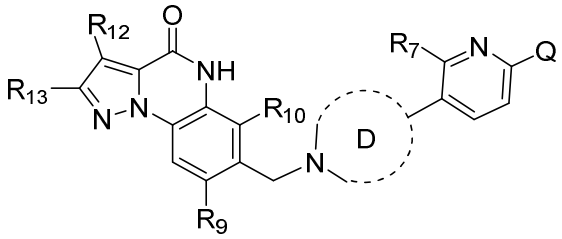


(VII)

wherein, R_9 and R_{10} are as defined in claim 8; L and Cy are as defined in any one of claims 1-3;

R_{12} and R_{13} are each independently selected from hydrogen, halogen, cyano, an optionally substituted C_{1-6} alkyl, an optionally substituted C_{1-3} alkoxy and optionally substituted C_{3-6} cycloalkyl, and at least one of R_{12} and R_{13} is not hydrogen.

12. The compound of claim 1, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, wherein the compound of Formula I is represented by Formulae VIII as shown below:



(VIII)

wherein, R_9 and R_{10} are as defined in claims 8 and 12; R_{12} and R_{13} are as defined in claim 12; D ring and Q are as defined in any one of claims 7 and 8; R_7 is as defined in any one of claims 6 and 8.

13. The compound of claim 11, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, wherein:

R_{12} and R_{13} are each independently halogen, cyano, an optionally substituted C_{1-3} alkyl or optionally substituted C_{3-6} cycloalkyl; preferably, R_{12} is hydrogen, and R_{13} is halogen, cyano, an optionally substituted C_{1-3} alkyl or optionally substituted C_{3-6} cycloalkyl; more preferably, R_{12} is halogen, cyano, an optionally substituted C_{1-3} alkyl or optionally substituted C_{3-6} cycloalkyl, and R_{13} is hydrogen; preferably, R_{12} is halogen, cyano, an optionally substituted C_{1-3} alkyl or optionally

substituted C_{3-6} cycloalkyl, and R_{13} is hydrogen; more preferably, R_{12} is halogen, C_{1-3} alkyl, halogenated C_{1-3} alkyl; and R_{13} is hydrogen;

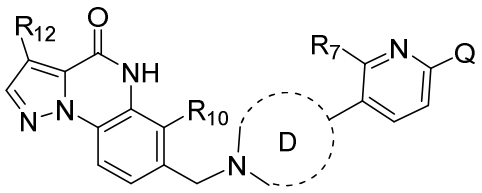
R_9 is hydrogen, R_{10} is halogen or C_{1-3} alkyl; preferably, R_9 is halogen or C_{1-3} alkyl, R_{10} is hydrogen; more preferably, R_9 is hydrogen, R_{10} is halogen; or R_9 is halogen, R_{10} is hydrogen;

the D ring is an optionally substituted 4-7 membered monocyclic ring containing at least 1 N atom; preferably the D ring is an optionally substituted piperazinyl, an optionally substituted piperidinyl, or an optionally substituted dihyropyridinyl; wherein when the ring D is substituted, the substituents can be 1-3 groups selected from a group consisting of halogen, hydroxyl, cyano, optionally substituted C_{1-3} alkyl, optionally substituted C_{1-3} alkoxy and optionally substituted C_{3-6} cycloalkyl;

R_7 is hydrogen, halogen, cyano, optionally substituted C_{1-3} alkyl, optionally substituted C_{1-3} alkoxy or optionally substituted C_{3-6} cycloalkyl, preferably, R_7 is hydrogen, halogen, cyano, C_{1-3} alkyl, halogenated C_{1-3} alkyl or C_{3-6} cycloalkyl;

Q is -C(O)-NR′R″, wherein R' and R" each are independently hydrogen, an optionally substituted C_{1-10} alkyl, an optionally substituted C_{3-8} cycloalkyl, an optionally substituted heterocyclic group, an optionally substituted aryl or optionally substituted heteroaryl, preferably hydrogen, an optionally substituted C_{1-4} alkyl, an optionally substituted C_{3-6} cycloalkyl or an optionally substituted 3-6 membered heterocyclic group; preferably, Q is a 5 membered heteroaryl optionally substituted by 1-3 substituents selected from halogen, cyano, C_{1-3} alkyl, halogenated C_{1-3} alkyl, C_{1-3} alkoxy and halogenated C_{1-3} alkoxy, the 5 membered heteroaryl is preferably pyrrolyl, pyrazolyl, imidazolyl or triazolyl.

14. The compound of claim 1, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, wherein the compound of Formula I is represented by Formulae IX as shown below:



(IX)

wherein, D ring and Q are as defined in any one of claims 7 and 8; R_7 is as defined in any one of claims 6 and 8;

R_{10} is halogen, optionally substituted C_{1-3} alkyl, or optionally substituted C_{1-3} alkoxy;

R_{12} is halogen, cyano, an optionally substituted C_{1-6} alkyl, an optionally substituted C_{1-3} alkoxy and optionally substituted C_{3-6} cycloalkyl.

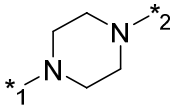
15. The compound of claim 14, or stereoisomers, tautomers, N-oxides, hydrates, solvates, isotope-substituted derivatives, or pharmaceutically acceptable salts thereof, or prodrugs thereof,

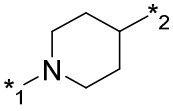
R_{10} is halogen or C_{1-3} alkyl; preferably, R_{10} is halogen, preferably F;

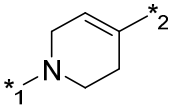
R_{12} is halogen, cyano, an optionally substituted C_{1-3} alkyl or optionally substituted C_{3-6} cycloalkyl; preferably, R_{12} is halogen, C_{1-3} alkyl, halogenated C_{1-3} alkyl;

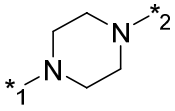
the D ring is an optionally substituted 4-7 membered monocyclic ring containing at least 1 N atom; preferably the D ring is an optionally substituted piperazinyl, an optionally substituted piperidinyl, or an optionally substituted dihyropyridinyl, wherein when the ring D is substituted, the substituents can be 1-3 groups selected from a group consisting of halogen, hydroxyl, cyano, optionally substituted C_{1-3} alkyl, optionally substituted C_{1-3} alkoxy and optionally substituted C_{3-6} cycloalkyl; or

the D ring is selected from the following groups:



, 

, or 

; preferably, 

;

wherein, *1 indicates the position at which the D ring is attached to methylene; *2 indicates the position at which the D ring is attached to the pyridyl;

R_7 is hydrogen, halogen, cyano, optionally substituted C_{1-3} alkyl, optionally substituted C_{1-3} alkoxy or optionally substituted C_{3-6} cycloalkyl, preferably, R_7 is hydrogen, halogen, cyano, C_{1-3} alkyl, halogenated C_{1-3} alkyl or C_{3-6} cycloalkyl;

Q is -C(O)-NR′R″, wherein R' and R" each are independently hydrogen, an optionally substituted C_{1-10} alkyl, an optionally substituted C_{3-8} cycloalkyl, an optionally substituted heterocyclic group, an optionally substituted aryl or optionally substituted heteroaryl, preferably hydrogen, an optionally substituted C_{1-4} alkyl, an optionally substituted C_{3-6} cycloalkyl or an optionally substituted 3-6 membered heterocyclic group.

16. The compound of claim 1, wherein the compound is selected from a group consisting of a group consisting of:

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[3,2-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[2,3-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[3,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thiazolo[4,5-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[2,3-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[3,2-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-1,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-1-methyl-1,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-2,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,5-dihydro-4H-pyrrolo[2,3-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methyl-3,5-dihydro-4H-pyrrolo[2,3-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)oxazolo[4,5-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thiazolo[5,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)oxazolo[5,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isoxazolo[3,4-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[3,2-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[3,4-c]quinolin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[3,2-c]quinolin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[3,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-9-fluorothieno[3,2-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-9-fluorothieno[3,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-9-fluorofuro[3,2-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-1,5-dihydro-4H-pyrrolo[3,2-c]quinolin-4-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-1-methyl-1,5-dihydro-4H-pyrrolo[3,2-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-1,5-dihydro-4H-imidazo[4,5-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-1-methyl-1,5-dihydro-4H-imidazo[4,5-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isothiazolo[4,5-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methyl-3,5-dihydro-4H-imidazo[4,5-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isothiazolo[5,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isoxazolo[5,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isothiazolo[3,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isothiazolo[4,3-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isoxazolo[4,5-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2,5-dihydro-4H-pyrrolo[3,4-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-2,5-dihydro-4H-pyrrolo[3,4-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[3,4-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isoxazolo[4,3-c]quinolin-4(5H)-one;

9-fluoro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[2,3-c]quinolin-4(5H)-one;

9-fluoro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thieno[3,2-c]quinolin-4(5H)-one;

9-fluoro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[2,3-c]quinolin-4(5H)-one;

9-fluoro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)thiazolo[4,5-c]quinolin-4(5H)-one;

9-fluoro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-1-methyl-1,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-furo[3,2-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-furo[3,2-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylisoxazolo[4,5-c]quinolin-4(5H)-one;

8-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoropyrrolo[1,2-c]quinazolin-5(6H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-fluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

8-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-fluoro-2-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-fluoro-2-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-9-fluoroimidazo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-9-fluoroimidazo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoroimidazo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoroimidazo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-chloro-pyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-chloro-pyrazolo[1,5-a]quinoxalin-4(5H)-one;

8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(ethylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-methyl-6-(ethylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(cyclopropylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-methyl-6-(cyclopropylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

7-((4-(2-fluoro-6-(ethylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(cyclopropylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-2,5-dihydro-4H-pyrazolo[3,4-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2,5-dihydro-4H-pyrazolo[3,4-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methyl-3,5-dihydro-4H-pyrazolo[3,4-c]quinolin-4-one;

8-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoropyrazolo[1,5-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoropyrazolo[1,5-c]quinazolin-5(6H)-one;

7-((4-(6-methylcarbamoyl-2-methylpyridin-3-yl)piperazin-1-yl)methyl)-1,2,3,5-tetrahydro-4H-pyrrolo[3,4-c]quinolin-4-one;

7-((4-(6-methylcarbamoyl-2-methylpyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-1,2,3,5-tetrahydro-4H-pyrrolo[3,4-c]quinolin-4-one;

7-((4-(6-methylcarbamoyl-2-methylpyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1,2,3,5-tetrahydro-4H-pyrrolo[3,4-c]quinolin-4-one;

7-((4-(6-methylcarbamoyl-2-fluoropyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1,2,3,5-tetrahydro-4H-pyrrolo[3,4-c]quinolin-4-one;

7-((4-(6-methylcarbamoyl-2-methylpyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-2-methyl-1,2,3,5-tetrahydro-4H-pyrrolo[3,4-c]quinolin-4-one;

7-((4-(6-methylcarbamoyl-2-fluoropyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-2-methyl-1,2,3,5-tetrahydro-4H-pyrrolo[3,4-c]quinolin-4-one;

7-((4-(6-methylcarbamoyl-2-methylpyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1,2,3,5-tetrahydro-4H-cyclopenta[c]quinolin-4-one;

7-((4-(6-methylcarbamoyl-2-fluoropyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1,2,3,5-tetrahydro-4H-cyclopenta[c]quinolin-4-one;

7-((4-(6-methylcarbamoyl-2-methylpyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3,5-dihydrofuro[3,2-c]quinolin-4(2H)-one;

7-((4-(6-methylcarbamoyl-2-fluoropyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3,5-dihydrofuro[3,2-c]quinolin-4(2H)-one;

7-((4-(6-methylcarbamoyl-2-methylpyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3,5-dihydrofuro[3,4-c]quinolin-4(1H)-one;

7-((4-(6-methylcarbamoyl-2-fluoropyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3,5-dihydrofuro[3,4-c]quinolin-4(1H)-one;

7-((4-(6-methylcarbamoyl-2-methylpyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1,2-dihydrofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(6-methylcarbamoyl-2-fluoropyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1,2-dihydrofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-2-methyl-2,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-8-fluoro-2-methyl-2,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-2-methyl-2,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-8-fluoro-2-methyl-2,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

6-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-1-methyl-1,5-dihydro-4H-pyrazolo[4,3-c]quinolin-4-one;

6-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-2,5-dihydro-4H-pyrazolo[3,4-c]quinolin-4-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-8-fluorooxazolo[5,4-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorooxazolo[5,4-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methyl-6-fluoroisoxazolo[4,5-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methyl-8-fluoroisoxazolo[4,5-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isoxazolo[4,5-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,5-dihydro-4H-pyrrolo[2,3-c]quinolin-4-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-1-methyl-1,5-dihydro-4H-imidazo[4,5-c]quinolin-4-one;

7-((4-(2-(difluoromethyl)-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-8-fluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-methylfuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-8-methylfuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-chlorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-carbamoylpyridin-3-yl)piperazin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

6-fluoro-7-((4-(5-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[2,3-c]quinolin-4(5H)-one;

6-fluoro-7-((4-(6-(methylcarbamoyl)-2-(trifluoromethyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperidin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(4H-1,2,4-triazol-3-yl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(5-methyl-1H-imidazol-2-yl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[2,3-c]quinolin-4(5H)-one;

7-((4-(6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[3,2-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorofuro[3,4-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-2-methylfuro[2,3-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2,6-difluorofuro[2,3-c]quinolin-4(5H)-one;

7-((4-(6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[3,2-c]quinolin-4(5H)-one;

8-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-7-fluoropyrazolo[1,5-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-9-fluoropyrazolo[1,5-c]quinazolin-5(6H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperidin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(ethylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(cyclopropylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(5-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-cyano-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(2,2-difluoroethylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(1H-imidazol-5-yl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-difluoromethyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-trifluoromethyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

(R)-6-fluoro-3-methyl-7-((3-((6-(methylcarbamoyl)pyridin-3-yl)amino)pyrrolidin-1-yl)methyl)pyrazolo[1,5-a]quinoxalin-4(5H)-one;

(R)-6-fluoro-7-((3-((2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)amino)pyrrolidin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

8-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-10-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-10-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,7-difluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2,7-difluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-7-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methyl-7-fluoroimidazo[1,2-c]quinazolin-5(6H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluorooxazolo[4,5-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[3,4-c]quinolin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)isoxazolo[3,4-c]quinolin-4(5H)-one;

7-((4-(6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoroimidazo[1,5-a]quinoxalin-4(5H)-one;

(R)-7-((3-((6-(methylcarbamoyl)pyridin-3-yl)amino)pyrrolidin-1-yl)methyl)-6-fluorofuro[2,3-c]quinolin-4(5H)-one;

6-fluoro-7-((4-(2-fluoro-6-(2,2-difluoroethylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[2,3-c]quinolin-4(5H)-one;

6-fluoro-7-((4-(6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[2,3-c]quinolin-4(5H)-one;

6-fluoro-7-((4-(6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[3,4-c]quinolin-4(5H)-one;

6-fluoro-7-((4-(6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)furo[3,2-c]quinolin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-2-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-3-methyl-7-((6-methylcarbamoyl-3',6'-dihydro-[3,4'-bipyridin]-1'(2'H)-yl)methyl)pyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-3-methyl-7-((4-(6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)pyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(2-fluoro-4-(methylcarbamoyl)phenyl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(2-chloro-4-(methylcarbamoyl)phenyl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

(R)-6-fluoro-7-((4-(2-fluoro-6-((tetrahydrofuran-3-yl)carbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-3-methyl-7-((4-(8-(methylamino)-1,7-naphthyridin-3-yl)piperazin-1-yl)methyl)pyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(6-(1H-imidazol-2-yl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(2-fluoro-6-((methyl-d3)carbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-cyclopropyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(3-fluoro-4-(methylcarbamoyl)phenyl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(2-methyl-4-(methylcarbamoyl)phenyl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-ethyl-6-fluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(2-fluoro-6-cyanopyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((2-fluoro-6-methylcarbamoyl-3',6'-dihydro-[3,4'-bipyridin]-1'(2'H)-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

(R)-6-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)-3-methylpiperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

(R)-6-fluoro-3-methyl-7-((8-methylcarbamoyl-1,2,4a,5-tetrahydropyrazino[1,2-d]pyrido[2,3-b][1,4]oxazin-3(4H)-yl)methyl)pyrazolo[1,5-a]quinoxalin-4(5H)-one;

8-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

8-fluoro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

8-fluoro-7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-dimethylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-dimethylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-dimethylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-chloro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-chloro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-chloro-7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

3,9-difluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)pyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-trifluoromethyl-6-fluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(ethylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(cyclopropylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,8-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,8-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,8-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-((methyl-d3)carbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(2,2-difluoroethylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-cyano-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

3-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

3-fluoro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

3-fluoro-7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

3-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-chloropyrazolo[1,5-a]quinoxalin-4(5H)-one;

3-fluoro-7-((4-(2-methyl-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-chloropyrazolo[1,5-a]quinoxalin-4(5H)-one;

3-fluoro-7-((4-(2-chloro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-chloropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-cyanopyridin-3-yl)piperazin-1-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

(R)-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)-3-methylpiperazin-1-yl)methyl)-3,-6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((2-fluoro-6-methylcarbamoyl-3',6'-dihydro-[3,4'-bipyridin]-1'(2'H)-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

(R)-7-((8-methylcarbamoyl-1,2,4a,5-tetrahydropyrazino[1,2-d]pyrido[2,3-b][1,4]oxazin-3(4H)-yl)methyl)-3,6-difluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2-methyl-3-chloropyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-2,3-dimethylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-cyano-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-6-fluoro-3-(trifluoromethyl)pyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-cyano-6-fluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)-3-isopropyl-6-fluoropyrazolo[1,5-a]quinoxalin-4(5H)-one;

6-fluoro-7-(1-(4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)ethyl)-3-methylpyrazolo[1,5-a]quinoxalin-4(5H)-one;

7-fluoro-8-((4-(2-fluoro-6-(methylcarbamoyl)pyridin-3-yl)piperazin-1-yl)methyl)imidazo[1,5-c]quinazolin-5(6H)-one;

or stereoisomers, tautomers, N-oxides, hydrates, isotope-substituted derivatives, solvates or pharmaceutically acceptable salts thereof, or mixtures thereof, or prodrugs thereof.

17. Use of the compound of any one of claims 1-16, or stereoisomers, tautomers, N-oxides, hydrates, isotope-substituted derivatives, solvates or pharmaceutically acceptable salts thereof, or

prodrugs thereof, or mixtures thereof in the manufacture of a medicament for the treatment or prevention of a disease or condition responsive to the inhibition of PARP activity;

preferably, the disease or condition is cancer; preferably, the cancer is selected from liver cancer, melanoma, Hodgkin's disease, non-Hodgkin's lymphomas, acute lymphocytic leukemia, chronic lymphocytic leukemia, multiple myeloma, neuroblastoma, breast cancer, ovarian cancer, lung cancer (such as small cell lung cancer), Wilms' tumor, cervical cancer, testicular cancer, soft-tissue sarcoma, primary macroglobulinemia, bladder cancer, chronic myeloid leukemia, primary brain cancer, malignant melanoma, gastric cancer, colon cancer, malignant pancreatic islet tumor, malignant carcinoid cancer, choriocarcinoma, mycosis fungoide, head and neck cancer, osteogenic sarcoma, pancreatic cancer, acute myeloid leukemia, hairy cell leukemia, rhabdomyosarcoma, Kaposi's sarcoma, urogenital tumors, thyroid cancer, esophageal cancer, malignant hypercalcemia, cervical hyperplasia, renal cell carcinoma, endometrial cancer, polycythemia vera, idiopathic thrombocythemia, adrenocortical carcinoma, skin cancer, or prostatic cancer;

preferably, the medicament further comprises at least one known anticancer drug or a pharmaceutically acceptable salt thereof; preferably, the anticancer drug is selected from a group consisting of a group consisting of: busulfan, melphalan, chlorambucil, cyclophosphamide, ifosfamide, temozolomide, bendamustine, cis-platin, mitomycin C, bleomycin, carboplatin, camptothecin, irinotecan, topotecan, doxorubicin, epirubicin, aclarubicin, mitoxantrone, methylhydroxy ellipticine, etoposide, 5-azacytidine, gemcitabine, 5-fluorouracil, capecitabine, methotrexate, 5-fluoro-2'-deoxy-uridine, fludarabine, nelarabine, ara-C, pralatrexate, pemetrexed, hydroxyurea, thioguanine, colchicine, vinblastine, vincristine, vinorelbine, paclitaxel, ixabepilone, cabazitaxel, docetaxel, mAb, panitumumab, necitumumab, nivolumab, pembrolizumab, ramucirumab, bevacizumab, pertuzumab, trastuzumab, cetuximab, obinutuzumab, ofatumumab, rituximab, alemtuzumab, ibritumomab, tositumomab, brentuximab, daratumumab, elotuzumab, T-DM1, Ofatumumab, Dinutuximab, Blinatumomab, ipilimumab, avastin, herceptin, mabthera, T-DM1, Trastuzumab Deruxtecan, Trastuzumab Emtansine, Datopotamab Deruxtecan, Gemtuzumab Ozogamicin, Brentuximab Vedotin, Inotuzumab Ozogamicin, Sacituzumab

govitecan, Enfortumab Vedotin, Belantamab Mafodotin, imatinib, gefitinib, erlotinib, osimertinib, afatinib, ceritinib, alectinib, crizotinib, erlotinib, lafenib, sorafenib, regorafenib, vemurafenib, dabrafenib, aflibercept, sunitinib, nilotinib, dasatinib, bosutinib, ponatinib, ibrutinib, cabozantinib, lenvatinib, vandetanib, trametinib, cobimetinib, axitinib, temsirolimus, idelalisib, pazopanib, Torisel, everolimus, tamoxifen, letrozole, fulvestrant, mitoguazone, octreotide, retinoic acid, arsenic, zoledronic acid, bortezomib, carfilzomib, Ixazomib, vismodegib, sonidegib, denosumab, thalidomide, lenalidomide, Venetoclax, Aldesleukin (recombinant human interleukin-2), sipueucel-T (prostate cancer therapeutic vaccine);

preferably, the medicament is to be used in combination with radiotherapy.

18. A pharmaceutical composition comprising the compound of any one of claims 1-16, or stereoisomers, tautomers, N-oxides, hydrates, isotope-substituted derivatives, solvates or pharmaceutically acceptable salts thereof, or prodrugs thereof or mixtures thereof and a pharmaceutically acceptable carrier.

19. The pharmaceutical composition of claim 18, wherein the composition further includes at least one known anticancer drug or pharmaceutically acceptable salts thereof; preferably, the at least one known anticancer drug is selected from a group consisting of the group consisting of: busulfan, melphalan, chlorambucil, cyclophosphamide, ifosfamide, temozolomide, bendamustine, cis-platin, mitomycin C, bleomycin, carboplatin, camptothecin, irinotecan, topotecan, doxorubicin, epirubicin, aclarubicin, mitoxantrone, methylhydroxy ellipticine, etoposide, 5-azacytidine, gemcitabine, 5-fluorouracil, capecitabine, methotrexate, 5-fluoro-2'-deoxy-uridine, fludarabine, nelarabine, ara-C, pralatrexate, pemetrexed, hydroxyurea, thioguanine, colchicine, vinblastine, vincristine, vinorelbine, paclitaxel, ixabepilone, cabazitaxel, docetaxel, mAb, panitumumab, necitumumab, nivolumab, pembrolizumab, ramucirumab, bevacizumab, pertuzumab, trastuzumab, cetuximab, obinutuzumab, ofatumumab, rituximab, alemtuzumab, ibritumomab, tositumomab, brentuximab, daratumumab, elotuzumab, T-DM1, Ofatumumab,

Dinutuximab, Blinatumomab, ipilimumab, avastin, herceptin, mabthera, imatinib, gefitinib, erlotinib, ostinib, afatinib, ceritinib, alectinib, crizotinib, erlotinib, lapatinib, solutinib lafenib, regorafenib, vemurafenib, dabrafenib, aflibercept, sunitinib, nilotinib, dasatinib, bosutinib, pratinib, brutinib, cabozantinib, lenvatinib, vandetanib, trametinib, cabitinib, axitinib, temsirolimus, idelalisib, pazopanib, everolimus, tamoxifen, letrozole, fulvestrant, mitoguanhydrazone, octreotide, retinoic acid, arsenic, zoledronic acid, bortezomib, carfilzomib, Ixazomib, vismodegib, sonidegib, denosumab, thalidomide, lenalidomide, Venetoclax, Aldesleukin (recombinant human interleukin-2), sipueucel-T (prostate cancer therapeutic vaccine).

20. The compound of any one of claims 1-16, or stereoisomers, tautomers, N-oxides, hydrates, isotope-substituted derivatives, solvates or pharmaceutically acceptable salts thereof, or prodrugs thereof, or mixtures thereof, for use in therapy.