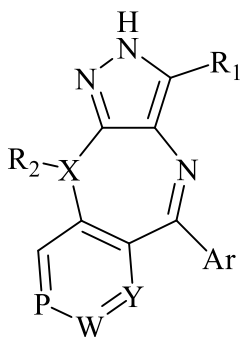


CLAIMS

1. A compound represented by formula (I), pharmaceutically acceptable salts or stereoisomers thereof,



(I)

wherein,

X is selected from CH or N;

R₁ is selected from the group consisting of hydrogen, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, C₁₋₆ alkoxy, halogenated C₁₋₆ alkyl and halogenated C₁₋₆ alkoxy;

R₂ is selected from the group consisting of hydrogen, C₁₋₆ alkyl and C₃₋₆ cycloalkyl;

Y is selected from CR₃ or N;

P is selected from CR₄ or N;

W is selected from CR₅ or N;

R₃, R₄ and R₅ are independently selected from the group consisting of hydrogen, hydroxy, amino, carboxy, cyano, nitro, halogen, C₁₋₆ alkyl, C₁₋₆ alkoxy, C₃₋₆ cycloalkyloxy, oxa C₅₋₈ cycloalkyloxy, halogenated C₁₋₆ alkoxy, C₂₋₈ alkenyl, C₂₋₈ alkynyl, C₃₋₆ cycloalkylamino, C₁₋₆ alkylsulfonyl, C₃₋₈ cycloalkylsulfonyl, C₁₋₆ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, -NR₁₁-(CH₂)_n-N(R₇)(R₈), C₁₋₆ alkylthio-(CH₂)_n, -(CH₂)_n-(3-14) membered cycloalkyl, -(CH₂)_n-(6-14) membered aryl, -(CH₂)_n-(5-14) membered heterocyclyl, and -(CH₂)_n-(5-14) membered heteroaryl; wherein, n=0-6; the ring-forming S atom in cycloalkyl, aryl,

heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, the ring-forming C atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to C(O); and the cycloalkyl, aryl, heteroaryl or heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl;

R₇ and R₈ are independently selected from the group consisting of hydrogen, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, C₁₋₆ alkoxy, halogenated C₁₋₆ alkyl, and halogenated C₁₋₆ alkoxy; and

P, W, and Y are not N simultaneously,

when Y is CR₃, P is CR₄, and W is N, R₄ cannot be C₁₋₆ alkyl;

when Y is CR₃, P is CR₄, and W is CR₅, one of R₄ and R₅ must be H, and

when R₄ is H, R₅ is selected from the group consisting of hydroxy, carboxy, C₁₋₆ alkyl, C₃₋₆ cycloalkyloxy, oxa C₅₋₈ cycloalkyloxy, halogenated C₁₋₆ alkoxy, C₂₋₈ alkenyl, C₂₋₈ alkynyl, C₃₋₆ cycloalkylamino, C₃₋₈ cycloalkylsulfonyl, C₁₋₆ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, -NR₁₁-(CH₂)_n-N(R₇)(R₈), C₁₋₆ alkylthio-(CH₂)_n-, -(CH₂)_n-(3-14) membered cycloalkyl, -(CH₂)_n-(6-14) membered aryl, -(CH₂)_n-(5-14) membered heterocyclyl, and -(CH₂)_n-(5-14) membered heteroaryl; wherein, n=0-6; the ring-forming S atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, the ring-forming C atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to C(O); and the cycloalkyl, aryl, heteroaryl or heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl;

when R₅ is H, R₄ is selected from the group consisting of hydroxy, amino, carboxy, cyano, nitro, halogen, C₁₋₆ alkyl, C₁₋₆ alkoxy, C₃₋₆ cycloalkyloxy, oxa C₅₋₈ cycloalkyloxy, halogenated C₁₋₆ alkoxy, C₂₋₈ alkenyl, C₂₋₈ alkynyl, C₃₋₆ cycloalkylamino, C₁₋₆ alkylsulfonyl, C₃₋₈ cycloalkylsulfonyl, C₁₋₆ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, -NR₁₁-(CH₂)_n-N(R₇)(R₈), C₁₋₆ alkylthio-(CH₂)_n-, -(CH₂)_n-(3-14) membered cycloalkyl, -(CH₂)_n-(6-14) membered aryl, -(CH₂)_n-(5-14) membered heterocyclyl, and -(CH₂)_n-(5-14) membered heteroaryl; wherein, n=0-6; the ring-forming S atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, the ring-forming C

atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to C(O); and the cycloalkyl, aryl, heteroaryl or heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl;

Ar is selected from the group consisting of 3-14 membered cycloalkyl, 6-14 membered aryl, 5-14 membered heterocyclyl and 5-14 membered heteroaryl, the ring-forming S atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, the ring-forming C atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to C(O), and Ar can be optionally substituted with 1 to 3 R₆;

R₆ is each independently selected from the group consisting of hydrogen, hydroxy, amino, carboxy, cyano, nitro, halogen, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, C₁₋₆ alkoxy, C₃₋₆ cycloalkyloxy, halogenated C₁₋₆ alkoxy, halogenated C₁₋₆ alkyl, C₃₋₆ cycloalkyl, C₂₋₈ alkenyl, C₂₋₈ alkynyl, -NR₁₁-(CH₂)_n-N(R₉)(R₁₀), amino C₁₋₆ alkyl, C₃₋₆ cycloalkylamino, C₁₋₆ alkylsulfonyl, C₃₋₈ cycloalkylsulfonyl, C₁₋₆ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, C₁₋₆ alkylthio, -(CH₂)_n-(6-14) membered cycloalkyl, -(CH₂)_n-(6-14) membered aryl, -(CH₂)_n-(5-14) membered heterocyclyl and -(CH₂)_n-(5-14) membered heteroaryl; wherein, n=0-6, and cycloalkyl, aryl, heteroaryl, heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl;

R₉ and R₁₀ are independently selected from the group consisting of hydrogen, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, C₁₋₆ alkoxy, halogenated C₁₋₆ alkyl, and halogenated C₁₋₆ alkoxy; and

R₁₁ is selected from the group consisting of hydrogen, C₁₋₆ alkyl and C₃₋₆ cycloalkyl.

2. The compound, pharmaceutically acceptable salts or stereoisomers thereof according to claim 1, wherein,

X is N;

R₁ is selected from C₁₋₃ alkyl, preferably methyl or ethyl;

R₂ is selected from the group consisting of hydrogen, methyl and ethyl;

Y is selected from CR₃ or N;

P is selected from CR₄ or N;

W is selected from CR₅ or N;

R₃, R₄ and R₅ are independently selected from the group consisting of hydrogen, hydroxy, amino, carboxy, cyano, nitro, halogen, C₁₋₆ alkyl, C₁₋₆ alkoxy, C₃₋₆ cycloalkyloxy, oxa C₅₋₈ cycloalkyloxy, halogenated C₁₋₆ alkoxy, C₂₋₈ alkenyl, C₂₋₈ alkynyl, C₃₋₆ cycloalkylamino, C₁₋₆ alkylsulfonyl, C₃₋₈ cycloalkylsulfonyl, C₁₋₆ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, -NR₁₁-(CH₂)_n-N(R₇)(R₈), C₁₋₆ alkylthio-(CH₂)_n-, -(CH₂)_n-(3-14) membered cycloalkyl, -(CH₂)_n-(6-14) membered aryl, -(CH₂)_n-(5-14) membered heterocyclyl, and -(CH₂)_n-(5-14) membered heteroaryl; wherein, n=0-6; the ring-forming S atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, and the ring-forming C atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to C(O); the cycloalkyl, aryl, heteroaryl or heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl;

R₇ and R₈ are independently selected from the group consisting of hydrogen, C₁₋₆ alkyl, C₃₋₆ cycloalkyl, C₁₋₆ alkoxy, halogenated C₁₋₆ alkyl or halogenated C₁₋₆ alkoxy; and

P, W, and Y are not N simultaneously,

when Y is CR₃, P is CR₄, and W is N, R₄ cannot be C₁₋₆ alkyl;

when Y is CR₃, P is CR₄, and W is CR₅, one of R₄ and R₅ must be H, and

when R₄ is H, R₅ is selected from the group consisting of hydroxy, carboxy, C₁₋₆ alkyl, C₃₋₆ cycloalkyloxy, oxa C₅₋₈ cycloalkyloxy, halogenated C₁₋₆ alkoxy, C₂₋₈ alkenyl, C₂₋₈ alkynyl, C₃₋₆ cycloalkylamino, C₃₋₈ cycloalkylsulfonyl, C₁₋₆ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, -NR₁₁-(CH₂)_n-N(R₇)(R₈), C₁₋₆ alkylthio-(CH₂)_n-, -(CH₂)_n-(3-14) membered cycloalkyl, -(CH₂)_n-(6-14) membered aryl, -(CH₂)_n-(5-14) membered heterocyclyl, and -(CH₂)_n-(5-14) membered heteroaryl; wherein, n=0-6; the ring-forming S atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, the ring-forming C atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to C(O); and

the cycloalkyl, aryl, heteroaryl or heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl;

when R₅ is H, R₄ is selected from the group consisting of hydroxy, amino, carboxy, cyano, nitro, halogen, C₁₋₆ alkyl, C₁₋₆ alkoxy, C₃₋₆ cycloalkyloxy, oxa C₅₋₈ cycloalkyloxy, halogenated C₁₋₆ alkoxy, C₂₋₈ alkenyl, C₂₋₈ alkynyl, C₃₋₆ cycloalkylamino, C₁₋₆ alkylsulfonyl, C₃₋₈ cycloalkylsulfonyl, C₁₋₆ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, -NR₁₁-(CH₂)_n-N(R₇)(R₈), C₁₋₆ alkylthio-(CH₂)_n, -(CH₂)_n-(3-14) membered cycloalkyl, -(CH₂)_n-(6-14) membered aryl, -(CH₂)_n-(5-14) membered heterocyclyl, and -(CH₂)_n-(5-14) membered heteroaryl; wherein, n=0-6; the ring-forming S atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, the ring-forming C atom in cycloalkyl, aryl, heterocyclyl or heteroaryl can be optionally oxidized to C(O); and the cycloalkyl, aryl, heteroaryl or heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl;

R₁₁ is selected from the group consisting of hydrogen, C₁₋₆ alkyl and C₃₋₆ cycloalkyl;

Ar is selected from the group consisting of 6-14 membered aryl or 5-10 membered heteroaryl; the ring-forming S atom in aryl and heteroaryl can be optionally oxidized to S(O) or S(O)₂, and the ring-forming C atom in aryl and heteroaryl can be optionally oxidized to C(O), wherein Ar can be optionally substituted with 1 to 3 R₆; and

R₆ is each independently selected from the group consisting of hydrogen, amino, cyano, halogen, C₁₋₄ alkyl, trifluoromethyl, methylsulfonyl, -(CH₂)_n-(5-10) membered heterocyclyl, and -(CH₂)_n-(5-10) membered heteroaryl; wherein, n=0-6; and the heteroaryl and heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl.

3. The compound, pharmaceutically acceptable salts or stereoisomers thereof according to claim 2, wherein the compound is represented by formula (II):



Ar is selected from the group consisting of 5-6 membered aryl and 5-6 membered heteroaryl, the ring-forming S atom in aryl and heteroaryl can be optionally oxidized to S(O) or S(O)₂, the ring-forming C atom in aryl and heteroaryl can be optionally oxidized to C(O), wherein Ar can be optionally substituted with 1 to 3 R₆;

Y is selected from CR₃ or N;

W is selected from CR₅ or N;

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oxidized to C(O); and the cycloalkyl, heteroaryl, and heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl;

R₇ and R₈ are independently selected from the group consisting of hydrogen, methyl, ethyl, isopropyl, and cyclopropyl; and

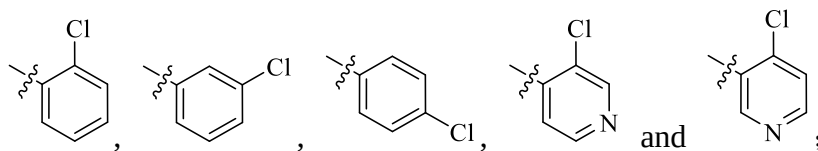
P, W, and Y are not N simultaneously, and at least one of P, W, and Y is N;

when Y is CR₃, P is CR₄, and W is N, R₄ cannot be C₁₋₄ alkyl; and

R₁₁ is selected from the group consisting of hydrogen, C₁₋₆ alkyl, and C₃₋₆ cycloalkyl.

4. The compound, pharmaceutically acceptable salts or stereoisomers thereof according to any one of claims 1 to 3, wherein,

Ar can be selected from the group consisting of:

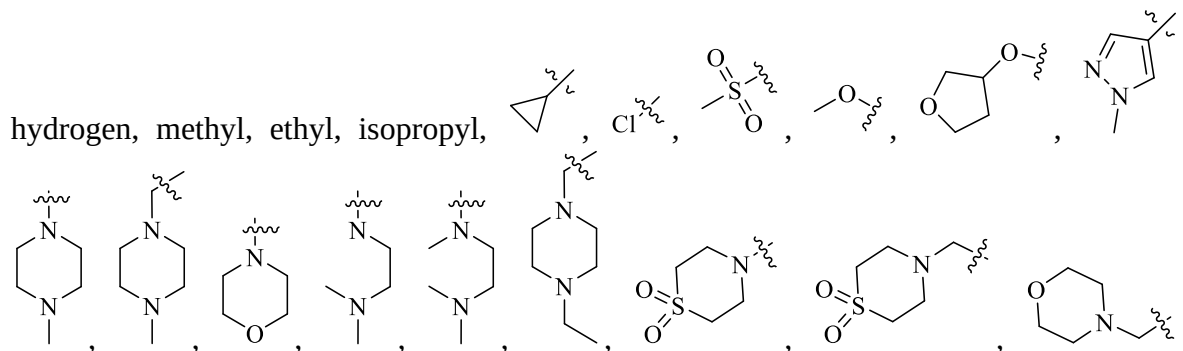


Y is selected from CR₃ or N;

P is selected from CR₄ or N;

W is selected from CR₅ or N;

R₃, R₄ and R₅ are independently selected from the group consisting of:



nitro, halogen, C₁₋₄ alkoxy, C₃₋₆ cycloalkyloxy, oxa C₅₋₈ cycloalkyloxy, halogenated C₁₋₄ alkoxy, C₃₋₆ cycloalkylamino, C₁₋₄ alkylsulfonyl, C₃₋₆ cycloalkylsulfonyl, C₁₋₄ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, -NR₁₁-(CH₂)_n-N(R₇)(R₈), -(CH₂)_n-C₃₋₁₀ cycloalkyl, -(CH₂)_n-(5-11) membered heterocyclyl, and -(CH₂)_n-(5-10) membered heteroaryl; wherein, n=0-6; the ring-forming S atom in cycloalkyl, heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, and the ring-forming C atom in cycloalkyl, heterocyclyl or heteroaryl can be optionally oxidized to C(O); and the cycloalkyl, heteroaryl, heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl.

7. The compound, pharmaceutically acceptable salts or stereoisomers thereof according to claim 6, wherein Ar is selected from phenyl or pyridyl; Ar can be optionally substituted with 1 to 3 R₆, wherein R₆ is each independently selected from the group consisting of hydrogen, amino, cyano, halogen, C₁₋₄ alkyl, trifluoromethyl, and methylsulfonyl;

Y is CR₃;

P is CR₄;

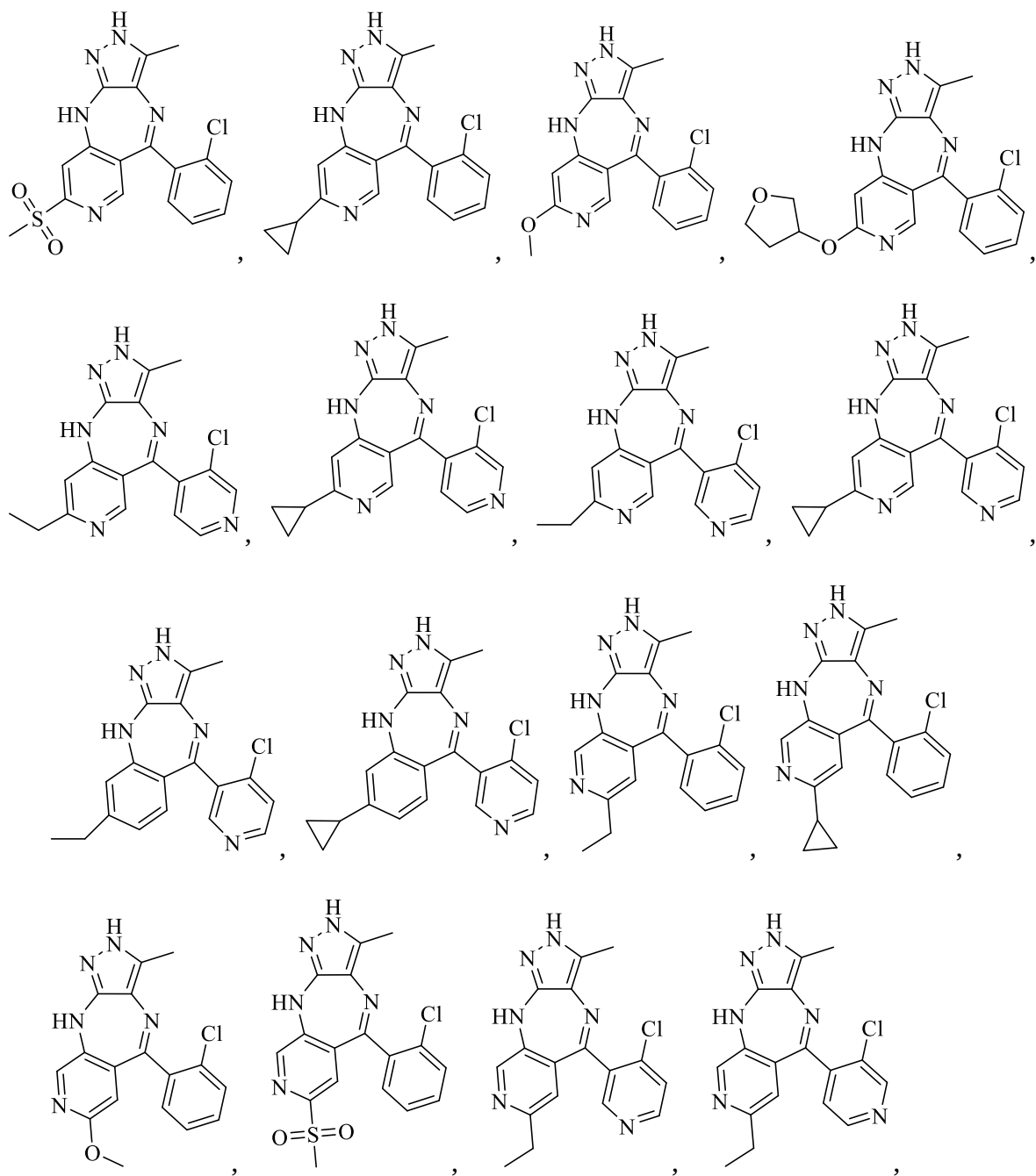
W is N;

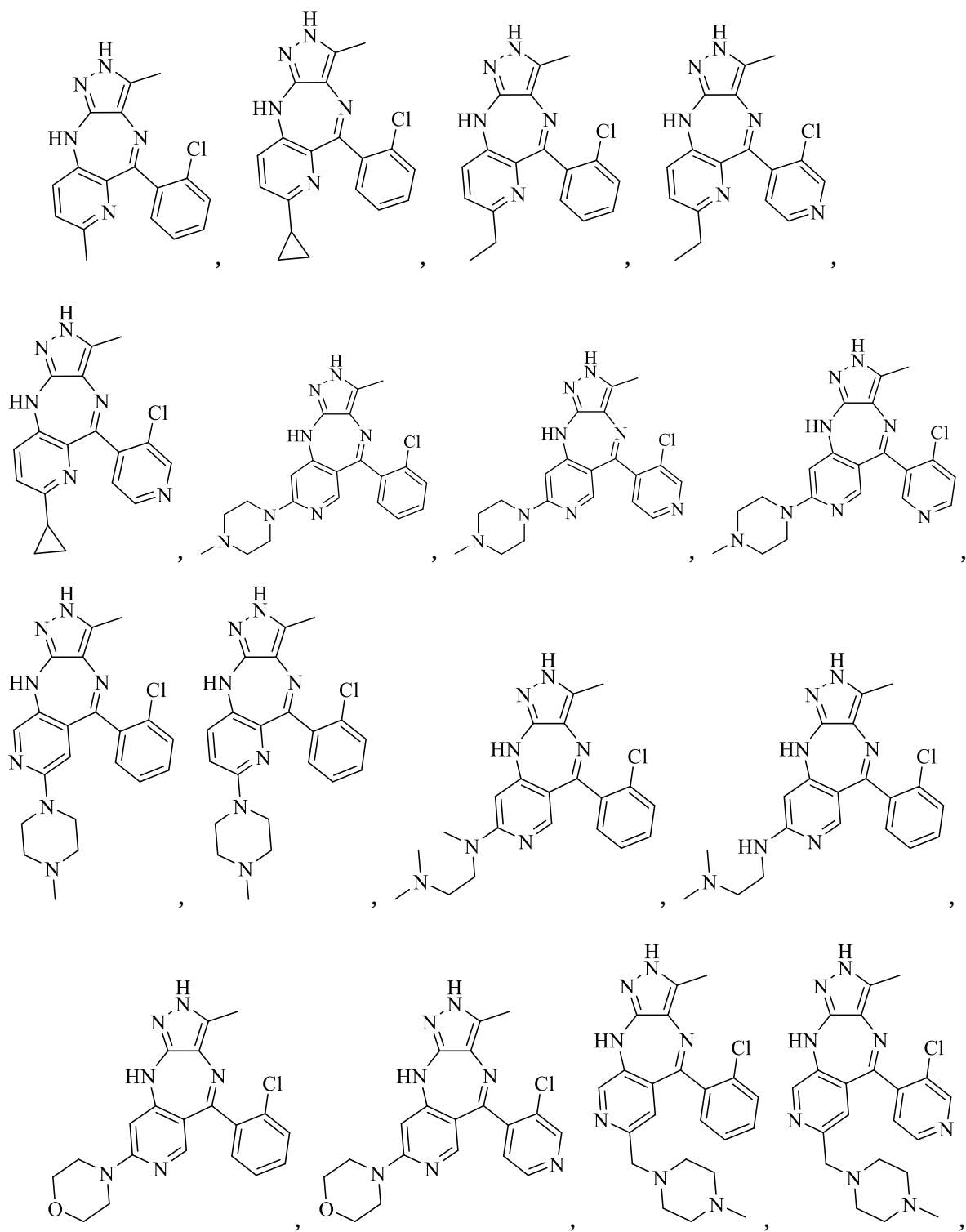
R₃ is selected from hydrogen or C₁₋₄ alkyl;

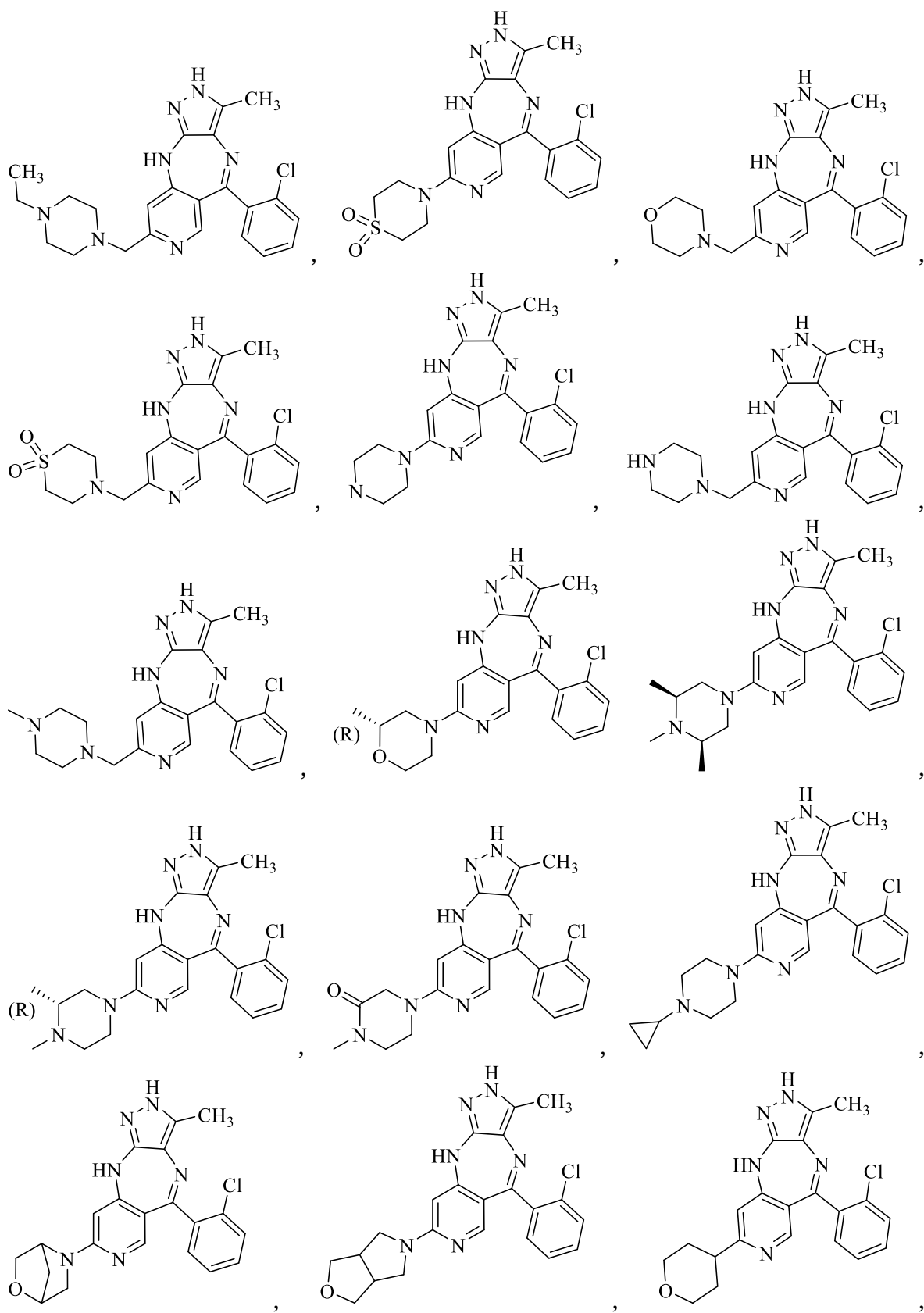
R₄ is selected from the group consisting of hydrogen, hydroxy, amino, carboxy, cyano, nitro, halogen, C₁₋₄ alkoxy, C₃₋₆ cycloalkyloxy, halogenated C₁₋₄ alkoxy, C₃₋₆ cycloalkylamino, C₁₋₄ alkylsulfonyl, C₁₋₄ alkylcarbonyl, C₃₋₆ cycloalkylcarbonyl, -NR₁₁-(CH₂)_n-N(R₇)(R₈), -(CH₂)_n-C₃₋₆ cycloalkyl, -(CH₂)_n-(5-6) membered monoheterocyclyl, -(CH₂)_n-(7-11) membered fused heterocyclyl, -(CH₂)_n-(5-6) monoheteroaryl, and -(CH₂)_n-(8-10) membered fused heteroaryl; wherein, n=0-6; the ring-forming S atom in cycloalkyl, heterocyclyl or heteroaryl can be optionally oxidized to S(O) or S(O)₂, and the ring-forming C atom in cycloalkyl, heterocyclyl or heteroaryl can be optionally oxidized to C(O); and the cycloalkyl, heteroaryl, and heterocyclyl can be optionally substituted with one or more independent C₁₋₃ alkyl or C₃₋₆ cycloalkyl.

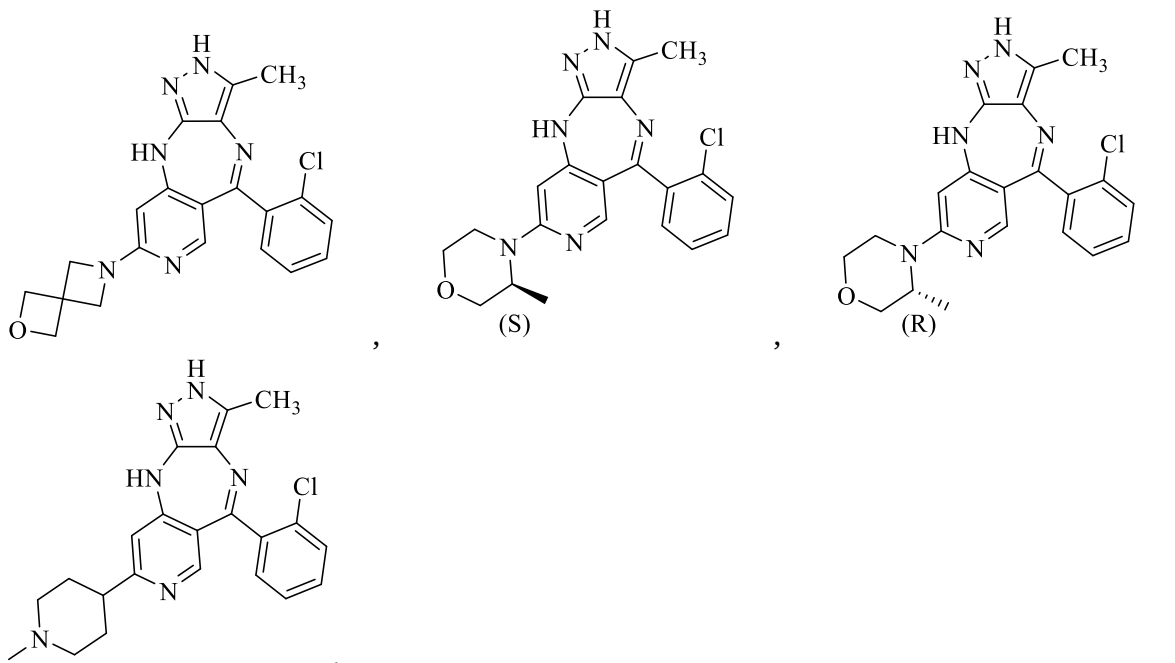
8. The compound, pharmaceutically acceptable salts or stereoisomers thereof according to

any one of claims 1 to 7, wherein the compound is selected from:

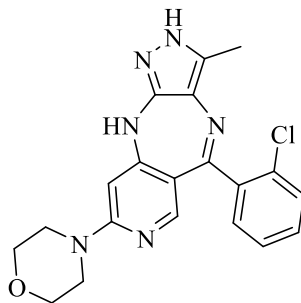








9. A crystal form I of a compound of formula (III), 4-(5-(2-chlorophenyl)-3-methyl-2,10-dihydropyrazolo[4,3-*b*]pyrido[4,3-*e*][1,4]diazepin-8-yl)morpholine, wherein the crystal form I has characteristic peaks at $7.4 \pm 0.2^\circ$, $17.9 \pm 0.2^\circ$, $18.9 \pm 0.2^\circ$, $19.4 \pm 0.2^\circ$, $21.5 \pm 0.2^\circ$ and $23.7 \pm 0.2^\circ$ in X-ray powder diffraction pattern; preferably, Cu-K α radiation is used for the X-ray powder diffraction, and the characteristic peak is expressed by 2θ angle; further preferably, the crystal form I also has characteristic peaks at $14.0 \pm 0.2^\circ$, $15.0 \pm 0.2^\circ$, $20.7 \pm 0.2^\circ$, $25.4 \pm 0.2^\circ$; more preferably, the crystal form I also has characteristic peaks at $11.7 \pm 0.2^\circ$, $22.8 \pm 0.2^\circ$, $27.8 \pm 0.2^\circ$;



(III).

10. A method for preparing the crystal form I according to claim 9, wherein the method comprises:

dissolving a compound of formula (III) in a single or mixed solvent with heating, and cooling to precipitate the crystal form I;

or

suspending a compound of formula (III) in a single or mixed solvent, stirring and filtering to obtain the crystal form I;

or

dissolving a compound of formula (III) in a single or mixed solvent, and concentrating under vacuum to obtain the crystal form I;

or

washing the compound shown in formula (III) with an appropriate amount of a single or mixed solvent, stirring, filtering and drying to obtain the crystal form I.

11. The method for preparing the crystal form I according to claim 10, wherein the single or mixed solvent is one or more selected from the group consisting of: methanol, ethanol, tetrahydrofuran, 2-methyltetrahydrofuran, dichloromethane, dichloroethane, ethyl acetate, acetonitrile, dimethyl sulfoxide, dimethyl sulfoxide/water, methanol/tetrahydrofuran, methanol/2-methyltetrahydrofuran, methanol/dichloromethane, ethanol/2-methyltetrahydrofuran, dichloromethane/water.

12. A method for preparing a compound of formula (III), comprising:

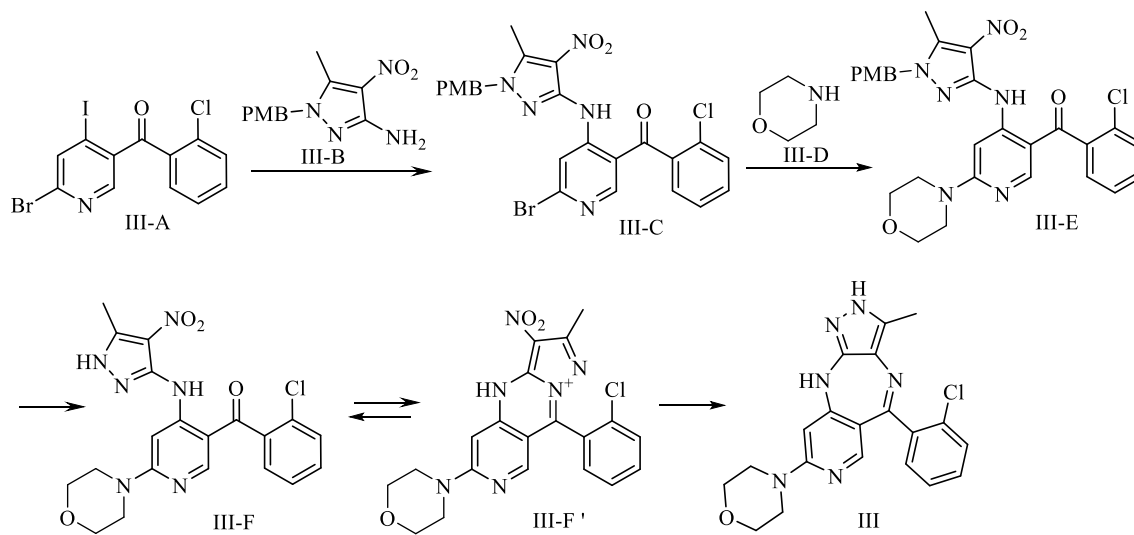
(1) reacting a compound of formula (III-A) with a compound of formula (III-B) to give a compound of formula (III-C);

(2) reacting the compound of formula (III-C) with a compound of formula (III-D) to give a compound of formula (III-E);

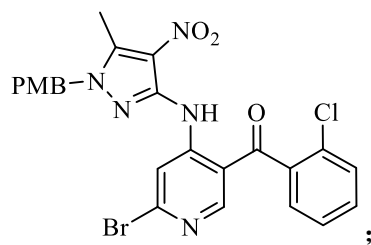
(3) deprotecting the compound of formula (III-E) to give a compound of formula (III-F) or formula (III-F'); and

(4) obtaining the compound of formula (III) from the compound of formula (III-F) or

(III-F');

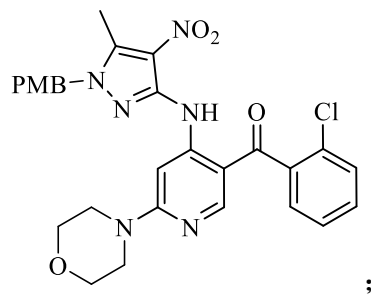


13. An intermediate for preparing a compound of formula (III), wherein the intermediate is represented by the following structural formula:



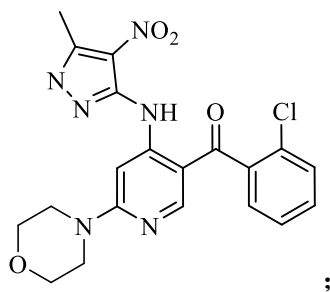
(III-C)

or



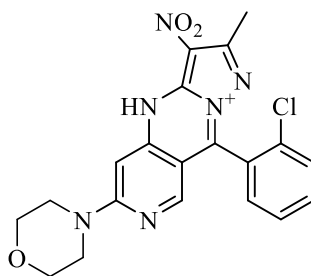
(III-E)

or



(III-F)

or



(III-F').

14. A pharmaceutical formulation, comprising the compound, pharmaceutically acceptable salts or stereoisomers thereof according to any one of claims 1-8, and/or the crystal form I of the compound of formula (III) according to claim 9, wherein, preferably the pharmaceutical formulation comprises one or more pharmaceutically acceptable carriers.

15. The pharmaceutical formulation of claim 14, further comprising one or more second therapeutically active agents, wherein the second therapeutically active agents are antimetabolites, growth factor inhibitors, mitosis inhibitors, antitumor hormones, alkylation agents, metals, topoisomerase inhibitors, hormones, immunomodulators, tumor suppressor genes, cancer vaccines, immune checkpoints or tumor immunotherapy-related antibodies, or small molecular drugs.

16. A pharmaceutical composition, comprising the compound, pharmaceutically acceptable salts or stereoisomers thereof according to any one of claims 1-8, and/or the crystal form I of the compound of formula (III) according to claim 9, and one or more second therapeutically active agents, wherein the second therapeutically active agents are

antimetabolites, growth factor inhibitors, mitosis inhibitors, antitumor hormones, alkylation agents, metals, topoisomerase inhibitors, hormones, immunomodulators, tumor suppressor genes, cancer vaccines, immune checkpoints or tumor immunotherapy-related antibodies, or small molecular drugs.

17. Use of the compounds, pharmaceutically acceptable salts, or stereoisomers thereof according to any one of claim 1-8, the crystal form I of the compound of formula (III) according to claim 9, or the pharmaceutical formulation according to any one of claims 14-15, or the pharmaceutical composition according to claim 16 in the manufacture of a medicament for treating a cancer mediated by abnormality of multi-kinases, wherein, the cancer includes lung cancer, squamous cell carcinoma, bladder cancer, gastric cancer, ovarian cancer, peritoneal cancer, breast cancer, breast ductal carcinoma, head and neck cancer, endometrial carcinoma, uterine body cancer, rectal cancer, liver cancer, renal carcinoma, renal pelvic tumor, esophageal carcinoma, esophageal adenocarcinoma, glioma, prostate cancer, thyroid cancer, female reproductive system cancer, carcinoma in situ, lymphoma, neurofibromatosis, bone cancer, skin cancer, brain cancer, colon cancer, testicular cancer, gastrointestinal stromal tumor, oral cancer, pharyngeal cancer, multiple myeloma, leukemia, non-Hodgkin lymphoma, chorioadenoma of large intestine, melanoma, cytoma, and sarcoma.