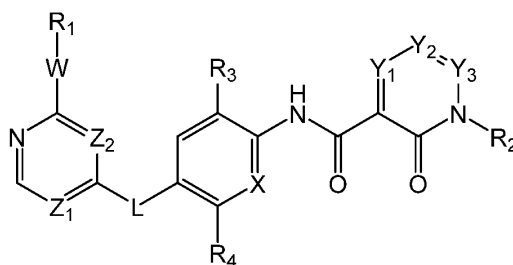


CLAIMS

1. A compound of formula (I):



(I)

or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein

X is N or CR₅;

Z₁ and Z₂ are each independently N or CR₆;

Y₁ is N or CR₇; Y₂ is N or CR₈; Y₃ is N or CR₉;

L is NH, O, S or CH₂;

W is absent or NH, O, S or CH₂;

R₁ is phenyl, 5-12 membered heteroaryl, 4-6 membered heterocyclyl or C₃₋₈

cycloalkyl, each of which is optionally substituted with one or more groups chosen from:

halogen, -CN, C₁₋₆ alkyl, C₂₋₆ alkenyl, C₂₋₆ alkynyl, C₁₋₆ haloalkyl, -(C₁₋₆ alkylene)_n-NH₂, -(C₁₋₆ alkylene)_n-NH(C₁₋₆ alkyl), -(C₁₋₆ alkylene)_n-N(C₁₋₆ alkyl)₂, -(C₁₋₆ alkylene)_n-OH, -(C₁₋₆ alkylene)_n-O-(C₁₋₆ alkyl) or -(C₁₋₆ alkylene)_n-O-(C₁₋₆ haloalkyl);

R₂ is hydrogen, -CN, C₁₋₆ alkyl, C₂₋₆ alkenyl, C₂₋₆ alkynyl, C₁₋₆ haloalkyl, -(C₁₋₆

alkylene)-NH₂, -(C₁₋₆ alkylene)-NH(C₁₋₆ alkyl), -(C₁₋₆ alkylene)-N(C₁₋₆ alkyl)₂, -(C₁₋₆

alkylene)-O-(C₁₋₆ alkyl), -(C₁₋₆ alkylene)-O-(C₁₋₆ haloalkyl), -(C₁₋₆ alkylene)-OH, C₃₋₈ cycloalkyl or 4-6 membered heterocyclyl;

R₃, R₄, R₅, R₆, R₇ and R₈ are each independently chosen from: hydrogen, halogen, -CN, C₁₋₆ alkyl, C₁₋₆ haloalkyl, -O(C₁₋₆ alkyl), -O(C₁₋₆ haloalkyl) or -OH;

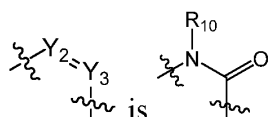
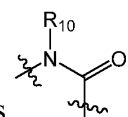
R₉ is hydrogen, halogen, -CN, C₁₋₆ alkyl, C₁₋₆ haloalkyl, -O(C₁₋₆ alkyl), -O(C₁₋₆

haloalkyl), -OH, -(C₁₋₆ alkylene)-OH, -NH₂, -NH(C₁₋₆ alkyl), -N(C₁₋₆ alkyl)₂ or C₃₋₈ cycloalkyl;

n is 0 or 1;

or when Y_3 is CR_9 , R_2 and R_9 together with the N atoms and C atoms to which they are attached form a 5-6 membered heteroaromatic ring or 5-6 membered heterocycle;

or when Y_2 is CR_8 and Y_3 is CR_9 , R_8 and R_9 together with the C atoms to which they are attached form a benzene ring;

5 or  is , wherein R_{10} is hydrogen or C_{1-6} alkyl;
provided that when X is CH, Z_1 is not N.

2. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer
10 thereof, wherein X is N.

3. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein X is CR_5 ; R_5 is hydrogen, halogen, C_{1-6} alkyl or $-O(C_{1-6}$ alkyl).
15

4. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein Z_1 and Z_2 are each independently CR_6 .

20 5. The compound of claim 4, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein both Z_1 and Z_2 are CH.

6. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or
25 a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein Y_1 is CR_7 , Y_2 is CR_8 , and Y_3 is CR_9 ; R_7 and R_8 are each independently chosen from: hydrogen, halogen, C_{1-6} alkyl or $-O(C_{1-6}$ alkyl), R_9 is hydrogen, C_{1-6} alkyl, C_{1-6} haloalkyl, $-O(C_{1-6}$ alkyl), $-NH_2$, $-NH(C_{1-6}$ alkyl) or $-N(C_{1-6}$ alkyl) $_2$; preferably, R_7 is hydrogen or $-O(C_{1-6}$ alkyl), R_8 is hydrogen, halogen or C_{1-6} alkyl, R_9 is hydrogen, C_{1-6}
30 alkyl, C_{1-6} haloalkyl, $-O(C_{1-6}$ alkyl), $-NH_2$, $-NH(C_{1-6}$ alkyl) or $-N(C_{1-6}$ alkyl) $_2$; and more

preferably, R₇ is hydrogen, R₈ is chosen from hydrogen or fluoro, and R₉ is hydrogen or methyl.

7. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or
5 a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein Y₁ is CR₇, Y₂ is N, and Y₃ is CR₉; R₇ is hydrogen, C₁₋₆ alkyl or -O(C₁₋₆ alkyl); R₉ is hydrogen, C₁₋₆ alkyl, C₁₋₆ haloalkyl or C₃₋₆ cycloalkyl; preferably, R₇ is hydrogen; R₉ is hydrogen, C₁₋₆ alkyl or C₃₋₆ cycloalkyl; and more preferably, R₇ is hydrogen; R₉ is hydrogen or methyl.

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8. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or
a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein L is O or CH₂, and preferably L is O.

15 9. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein W is absent or NH, and preferably W is absent.

10. The compound of any one of claims 1-9, or a pharmaceutically acceptable salt
20 thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein R₁ is phenyl, 5-12 membered heteroaryl, 4-6 membered heterocyclyl or C₃₋₈ cycloalkyl, each of which is optionally substituted with one or more groups chosen from: halogen, C₁₋₆ alkyl, C₁₋₆ haloalkyl, -(C₁₋₆ alkylene)_n-NH₂, -(C₁₋₆ alkylene)_n-NH(C₁₋₆ alkyl), -(C₁₋₆ alkylene)_n-N(C₁₋₆ alkyl)₂ or -(C₁₋₆ alkylene)_n-OH;
25 preferably R₁ is phenyl, pyrazolyl, pyrrolyl, furanyl, thienyl, pyridyl, thiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, imidazo[1,2-a]pyridyl, piperazinyl or cyclohexenyl, each of which is optionally substituted with one or more groups chosen from: halogen, C₁₋₆ alkyl, C₁₋₆ haloalkyl, -(C₁₋₆ alkylene)_n-NH₂, -(C₁₋₆ alkylene)_n-NH(C₁₋₆ alkyl), -(C₁₋₆ alkylene)_n-N(C₁₋₆ alkyl)₂ or -(C₁₋₆ alkylene)_n-OH; more preferably R₁ is pyrazolyl or
30 pyrrolyl, each of which is optionally substituted with one or more groups chosen from: C₁₋₆ alkyl, C₁₋₆ haloalkyl, -(C₁₋₆ alkylene)-NH₂, -(C₁₋₆ alkylene)-NH(C₁₋₆ alkyl), -(C₁₋₆ alkylene)-N(C₁₋₆ alkyl)₂ or -(C₁₋₆ alkylene)-OH; and still more preferably R₁ is pyrazolyl

or pyrrolyl, each of which is optionally substituted with one or more C₁₋₆ alkyl, preferably methyl.

11. The compound of claim 10, or a pharmaceutically acceptable salt thereof,
5 and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein R₁ is phenyl optionally substituted with one or more halogen.

12. The compound of claim 10, or a pharmaceutically acceptable salt thereof,
and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a
10 tautomer thereof, wherein R₁ is furanyl, thienyl, pyridyl, thiazolyl, 1,2,3-triazolyl, 1,2,4-triazolyl, imidazolyl, imidazo[1,2-a]pyridyl, piperazinyl or cyclohexenyl, each of which is optionally substituted with one or more C₁₋₆ alkyl.

13. The compound of any one of claims 1-9, or a pharmaceutically acceptable salt
15 thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein W is NH; R₁ is pyrazolyl, pyridyl or thiazolyl, each of which is optionally substituted with one or more groups chosen from: halogen, C₁₋₆ alkyl, C₁₋₆ haloalkyl, -(C₁₋₆ alkylene)-NH₂, -(C₁₋₆ alkylene)-NH(C₁₋₆ alkyl), -(C₁₋₆ alkylene)-N(C₁₋₆ alkyl)₂ or -(C₁₋₆ alkylene)-OH; preferably R₁ is pyrazolyl, pyridyl or thiazolyl,
20 each of which is optionally substituted with one or more groups chosen from: C₁₋₆ alkyl or C₁₋₆ haloalkyl.

14. The compound of any one of claims 1-13, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer
25 and a tautomer thereof, wherein R₂ is hydrogen, C₁₋₆ alkyl, C₂₋₆ alkenyl, C₁₋₆ haloalkyl, -(C₁₋₆ alkylene)-N(C₁₋₆ alkyl)₂, -(C₁₋₆ alkylene)-O-(C₁₋₆ alkyl), -(C₁₋₆ alkylene)-OH, C₃₋₆ cycloalkyl or 4-6 membered heterocyclyl, preferably R₂ is C₁₋₆ alkyl, C₂₋₆ alkenyl, -(CH₂CH₂)-O-(C₁₋₆ alkyl), -(CH₂CH₂)-OH, C₃₋₆ cycloalkyl or oxetanyl, and more preferably R₂ is C₁₋₆ alkyl, preferably methyl, ethyl or i-propyl.

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15. The compound of any one of claims 1-14, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer

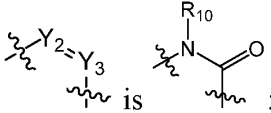
and a tautomer thereof, wherein R_3 and R_4 are each independently chosen from: hydrogen, halogen, $-\text{CN}$, C_{1-6} alkyl or $-\text{O}(\text{C}_{1-6}$ alkyl); and when X is CH , at least one of R_3 and R_4 is hydrogen; preferably wherein R_3 is hydrogen, halogen, $-\text{CN}$, C_{1-6} alkyl or $-\text{O}(\text{C}_{1-6}$ alkyl); R_4 is hydrogen or C_{1-6} alkyl.

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16. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein when Y_3 is CR_9 , R_2 and R_9 together with the N atoms and C atoms to which they are attached form pyridine or pyrrolidine.

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17. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer

thereof, wherein  is R_{10} is C_{1-6} alkyl.

15

18. The compound of claim 1, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein X is CR_5 ; Z_1 and Z_2 are each independently CR_6 ; Y_1 is CR_7 ; Y_2 is N or CR_8 ; Y_3 is CR_9 ; W is absent; R_1 is 5-6 membered heteroaryl optionally substituted with one or more C_{1-6} alkyl; R_2 is C_{1-6} alkyl; R_3 , R_4 , R_5 , R_6 , R_7 and R_8 are each independently chosen from: hydrogen, halogen, C_{1-6} alkyl or $-\text{O}(\text{C}_{1-6}$ alkyl), and at least one of R_3 and R_4 is hydrogen; R_9 is hydrogen or C_{1-6} alkyl.

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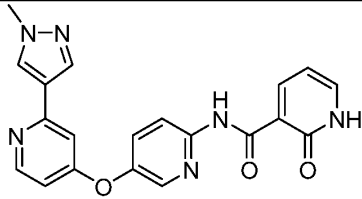
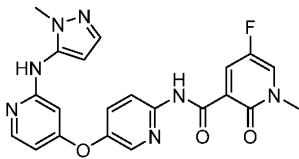
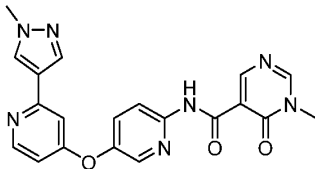
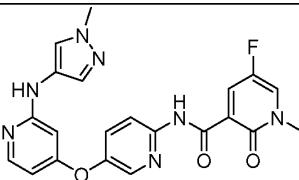
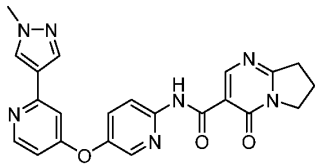
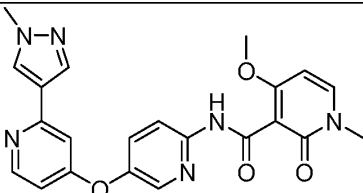
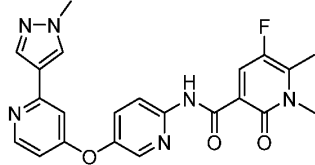
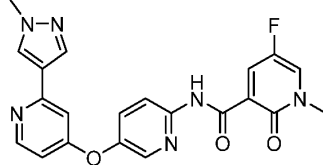
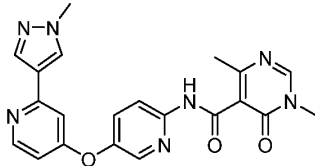
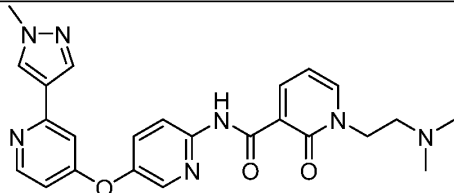
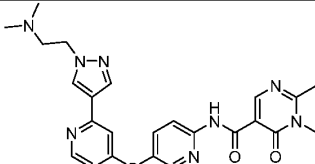
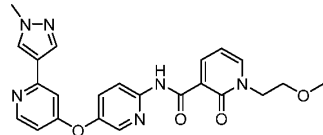
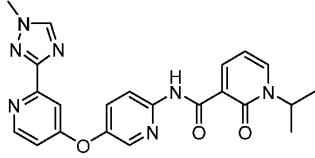
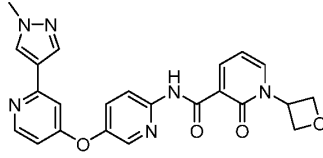
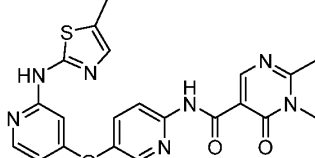
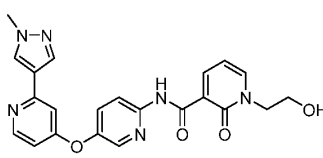
19. The compound of claim 18, or a pharmaceutically acceptable salt thereof, and/or a deuterate, a solvate, a racemic mixture, an enantiomer, a diastereomer and a tautomer thereof, wherein X is CH ; both Z_1 and Z_2 are CH ; Y_1 is CH ; Y_2 is N or CH ; Y_3 is CR_9 ; W is absent; R_1 is pyrazolyl optionally substituted with one or more C_{1-6} alkyl; R_2 is C_{1-6} alkyl; R_3 is hydrogen, halogen, C_{1-6} alkyl or $-\text{O}(\text{C}_{1-6}$ alkyl); R_4 is hydrogen; R_9 is hydrogen or C_{1-6} alkyl.

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20. The compound of formula (I) of claim 1, or a pharmaceutically acceptable salt thereof, which is chosen from:

30

No.	Structural formula	No.	Structural formula
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33		101	
34		102	
35		103	
36		104	
37		105	
38		106	
39		107	

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44		112	
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47		115	

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68			

21. A pharmaceutical composition, comprising the compound of any one of claims 1-20 or a pharmaceutically acceptable salt thereof, and optionally comprising a pharmaceutically acceptable excipient.

22. Use of the compound of any one of claims 1-20 or a pharmaceutically acceptable salt thereof in the manufacture of a medicament for the treatment of a disease in a subject.

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23. The use of claim 22, wherein the disease is cancer, an autoimmune disease, an inflammatory disease, a metabolic disease, a neurodegenerative disease, obesity or an

- obesity-related disease; preferably, wherein the cancer is chosen from solid tumor or hematologic malignancy; the autoimmune disease or inflammatory disease is chosen from arthritis (including rheumatoid arthritis and collagen-induced arthritis), osteoarthritis, pigmented villonodular synovitis (PVNS), systemic lupus erythematosus,
- 5 multiple sclerosis, autoimmune nephritis, Crohn's disease, asthma or chronic obstructive pulmonary disease; and more preferably, wherein the cancer is chosen from ovarian cancer, lung cancer (including non-small cell lung cancer), brain tumor (including glioblastoma (GBM)), tenosynovial giant cell tumor, gastrointestinal stromal tumor (GIST), gastric cancer, esophageal cancer, colon cancer, colorectal cancer, pancreatic
- 10 cancer, prostate cancer, breast cancer, cervical cancer, melanoma, mesothelioma, mesothelial carcinoma, renal cancer, liver cancer, thyroid carcinoma, head and neck cancer, urothelial carcinoma, bladder cancer, endometrial cancer, choriocarcinoma, adrenal carcinoma, sarcoma, leukemia, lymphoma or myeloma.
- 15 24. A combination, comprising the compound of any one of claims 1-20 or a pharmaceutically acceptable salt thereof, and at least one additional therapeutic agent, for example, an anti-neoplastic agent, including a chemotherapeutic agent, an immune checkpoint inhibitor or agonist, and a targeted therapeutic agent.