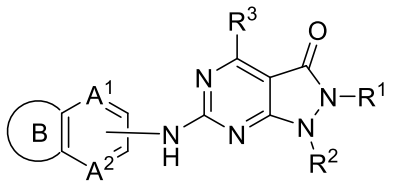
CLAIMS

1. A compound of Formula (I), or a pharmaceutically acceptable salt thereof, having the structure:

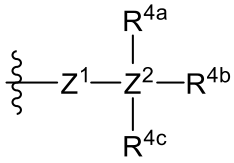


(I)

wherein:

R^1 is an optionally substituted C_{2-4} alkenyl, wherein when the C_{2-4} alkenyl is substituted, the C_{2-4} alkenyl is substituted with one or more substituents selected from the group consisting of halogen, C_{1-4} alkoxy, C_{1-4} haloalkyl, C_{1-4} haloalkoxy, cyano, amino, mono-C_{1-4} alkyl amine and di-C_{1-4} alkyl amine;

R^2 is a substituted monocyclic, nitrogen-containing heteroaryl substituted with



;

R^3 is hydrogen or an unsubstituted C_{1-4} alkyl;

A^1 is CR^{6A} or N;

A^2 is CR^{6B} or N;

Z^1 is a single bond, -C(=O)- or an optionally substituted C_{1-6} alkylene group, wherein one or two more methylene groups constituting the optionally substituted C_{1-6} alkylene group are independently optionally replaced by an oxygen atom or carbonyl group, and wherein when the C_{1-6} alkylene group is substituted, one or more methylene group are independently substituted with an unsubstituted C_{1-6} alkyl group;

Z^2 is N or C, and when Z^2 is N, then R^{4c} is absent;

R^{4a} and R^{4b} are independently selected from the group consisting of hydrogen, halogen, cyano, hydroxy, an unsubstituted C_{1-6} alkyl, an unsubstituted hydroxy(C_{1-6} alkyl), an unsubstituted alkoxy(C_{1-6} alkyl), an unsubstituted C_{2-7} acyl, an unsubstituted -C-carboxy having 2-7 carbons, an unsubstituted -C-amido and an unsubstituted C_{1-7} alkylsulfonyl; or

R^{4a} and R^{4b} together form an optionally substituted C_{1-6} alkylene, wherein one or two more methylene groups constituting the C_{1-6} alkylene group are independently optionally replaced by an oxygen atom, a sulfur atom, a sulfinyl group, a sulfonyl group, a carbonyl group or–(NR^5)-, and wherein when the C_{1-6} alkylene group is substituted, one or more methylene group are independently substituted with a substituent selected from the group consisting of halogen and an unsubstituted C_{1-6} alkyl; or

R^{4a} and R^{4b} together with Z^2 form an unsubstituted monocyclic C_{3-6} cycloalkyl and an unsubstituted 4-, 5-, or 6-membered heterocyclyl;

R^{4c} is selected from the group consisting of halogen, hydroxy, an unsubstituted C_{1-6} alkyl and an unsubstituted hydroxy(C_{1-6} alkyl);

R^5 is hydrogen, an unsubstituted C_{1-6} alkyl or an unsubstituted C_{1-6} haloalkyl;

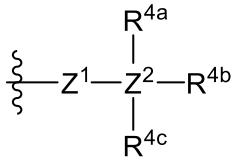
R^{6A} and R^{6B} are independently hydrogen, halogen or an unsubstituted C_{1-4} alkyl; and

Ring B is an optionally substituted monocyclic C_{5-7} cycloalkyl, an optionally substituted 5-7 membered monocyclic heterocyclyl or an optionally substituted 7-10 membered bicyclic heterocyclyl, wherein when Ring B is substituted, Ring B is substituted with one or more substituents selected from the group consisting of halogen, an optionally substituted C_{1-6} alkyl, an optionally substituted C_{1-6} haloalkyl, an optionally substituted C_{3-6} cycloalkyl, an optionally substituted aryl, an optionally substituted heteroaryl, an optionally substituted heterocyclyl, an optionally substituted aryl(C_{1-6} alkyl), an optionally substituted heteroaryl(C_{1-6} alkyl), an optionally substituted heterocyclyl(C_{1-6} alkyl), an optionally substituted acyl, an optionally substituted –hydroxy(C_{1-6} alkyl), an optionally substituted –C-amido, an optionally substituted –C-amido(C_{1-6} alkyl), an optionally substituted –N-amido, an optionally substituted –N-amido(C_{1-6} alkyl), an optionally substituted mono-substituted amine, an optionally substituted di-substituted amine, an optionally substituted mono-substituted amine(C_{1-6} alkyl), an optionally substituted di-substituted amine(C_{1-6} alkyl) and an optionally substituted sulfonyl.

2. The compound of Claim 1, wherein R^1 is an unsubstituted C_{2-4} alkenyl.

3. The compound of Claim 1, wherein R^1 is $-CH_2CH=CH_2$.

4. The compound of Claim 1, wherein R^2 is an optionally substituted monocyclic, nitrogen-containing heteroaryl.

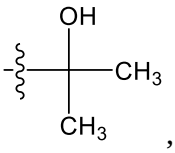
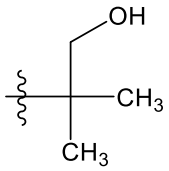
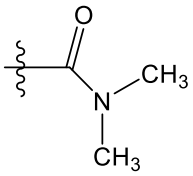
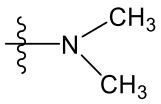
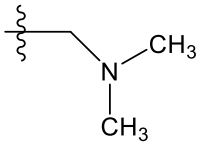
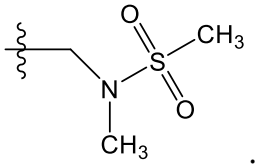


5. The compound of Claim 4, wherein R^2 is substituted with , wherein Z^1 is a single bond and Z^2 is C.

6. The compound of Claim 5, wherein R^{4a} and R^{4b} are independently selected from the group consisting of hydrogen, halogen, cyano, hydroxy, an unsubstituted C_{1-6} alkyl, an unsubstituted hydroxy(C_{1-6} alkyl), an unsubstituted alkoxy(C_{1-6} alkyl), an unsubstituted C_{2-7} acyl, an unsubstituted -C-carboxy having 2-7 carbons, an unsubstituted -C-amido and an unsubstituted C_{1-7} alkylsulfonyl.

7. The compound of Claim 6, wherein R^{4a} and R^{4b} are independently hydroxy or an unsubstituted C_{1-6} alkyl.

8. The compound of Claim 6, wherein R^{4c} is an unsubstituted C_{1-6} alkyl.

9. The compound of Claim 4, wherein R^2 is substituted with , , , ,  or .

10. The compound of Claim 1, wherein R^3 is hydrogen.

11. The compound of Claim 1, wherein A^1 is CR^{6A}; and A^2 is CR^{6B}.

12. The compound of Claim 11, wherein R^{6A} is hydrogen; and R^{6B} is hydrogen.

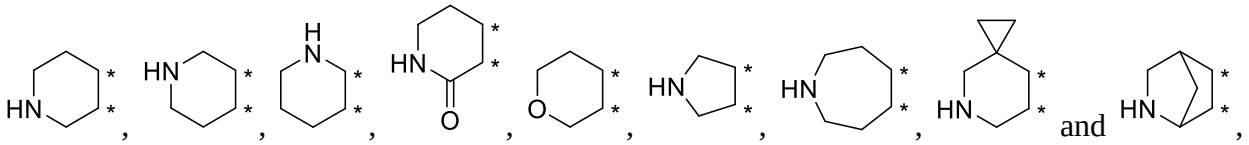
13. The compound Claim 1, wherein A^1 is N; and A^2 is CR^{6B}; or A^1 is CR^{6A}; and A^2 is N.

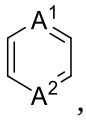
14. The compound of Claim 13, wherein R^{6A} is hydrogen; and R^{6B} is hydrogen.

15. The compound Claim 1, wherein Ring B is an optionally substituted monocyclic C_{5-7} cycloalkyl.

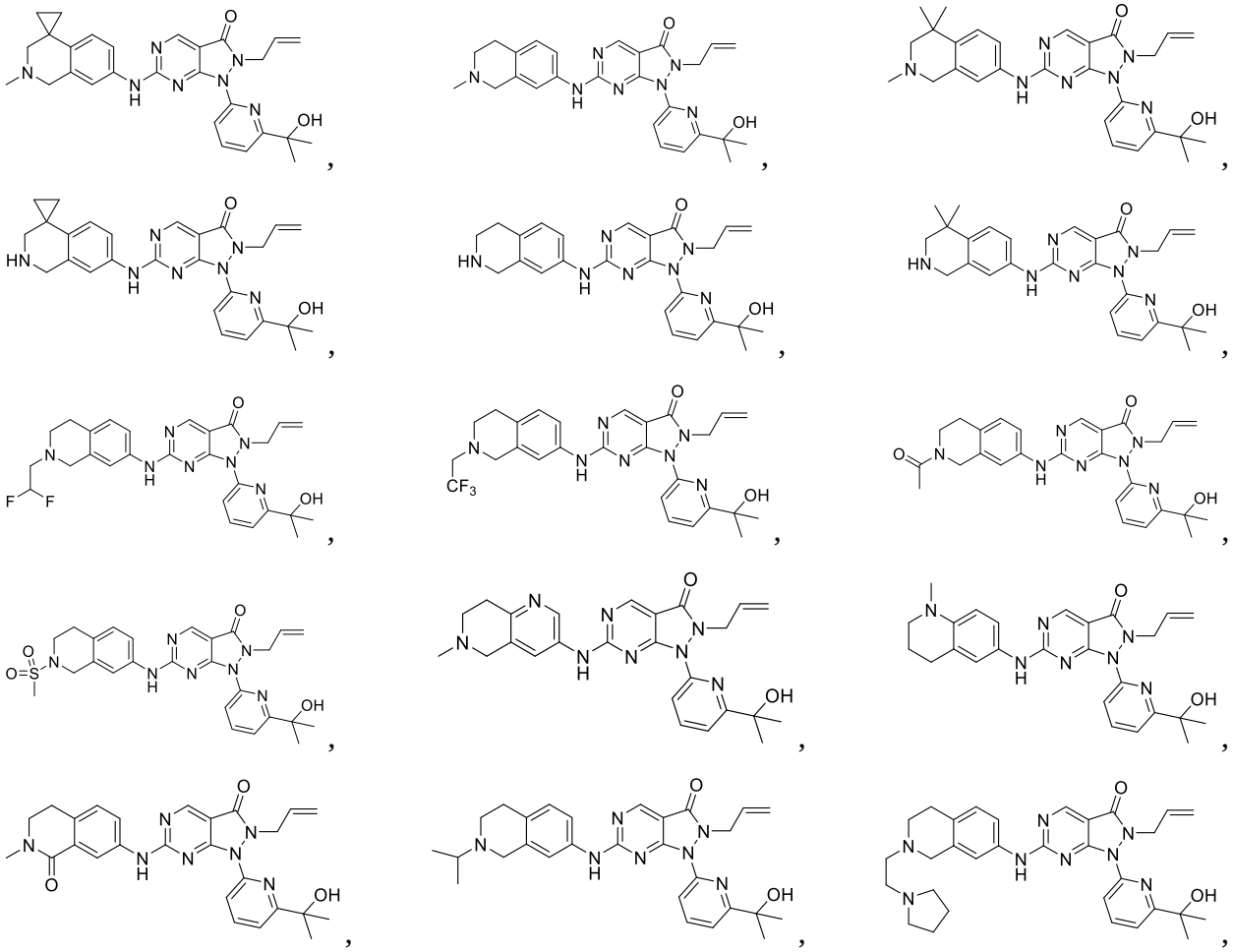
16. The compound of Claim 1, wherein Ring B is an optionally substituted 5-7 membered monocyclic heterocyclyl or an optionally substituted 7-10 membered bicyclic heterocyclyl.

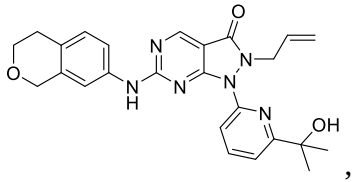
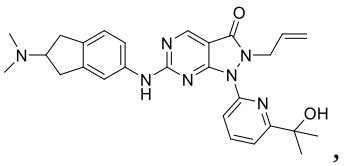
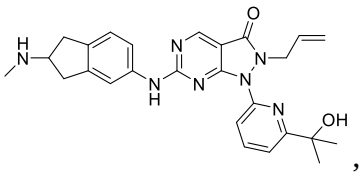
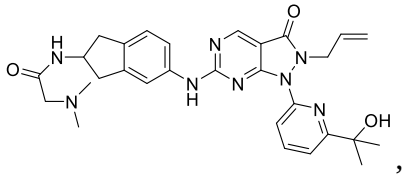
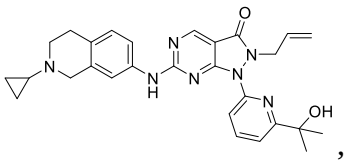
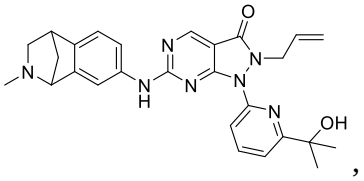
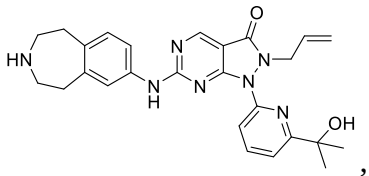
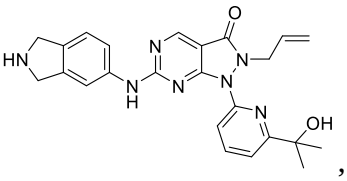
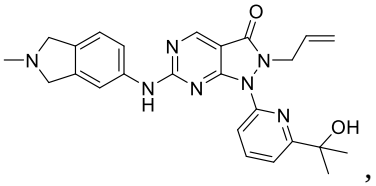
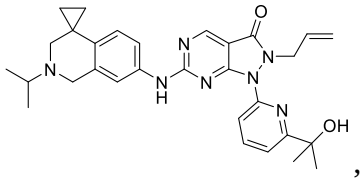
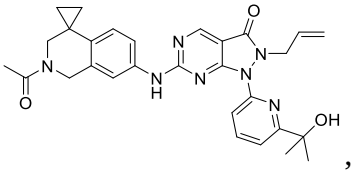
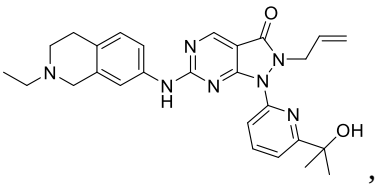
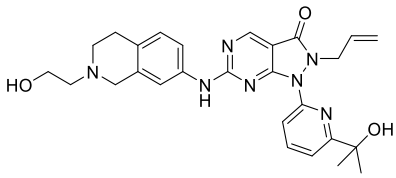
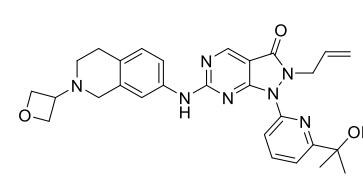
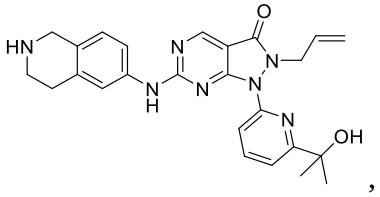
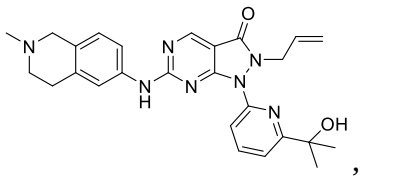
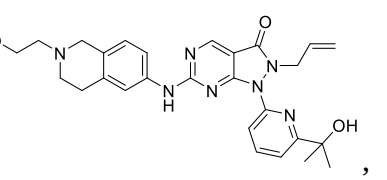
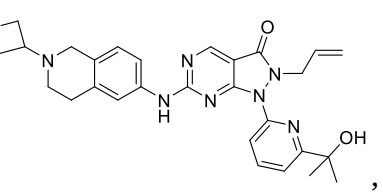
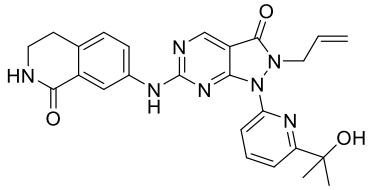
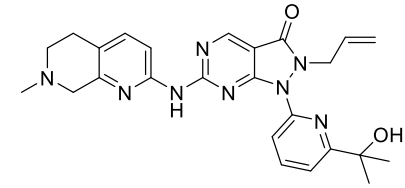
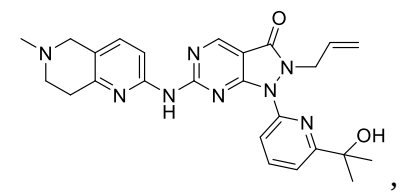
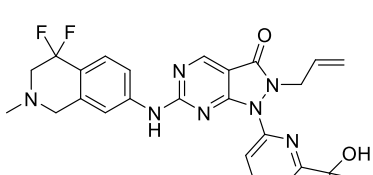
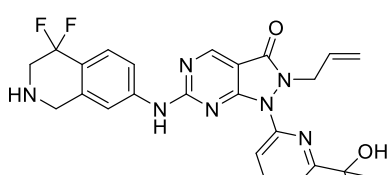
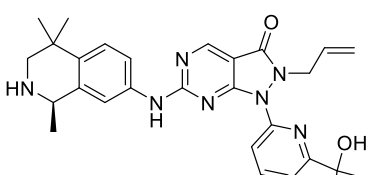
17. The compound of Claim 16, wherein Ring B is selected from the group consisting of:



wherein the asterisks indicate the points of attachment to ring , wherein each ring can be optionally substituted at a ring carbon, and wherein each ring can be optionally substituted at a ring nitrogen.

18. The compound of Claim 1, wherein the compound is selected from the group consisting of:

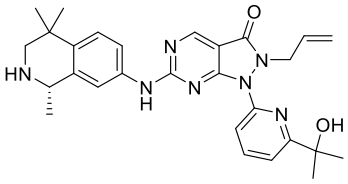


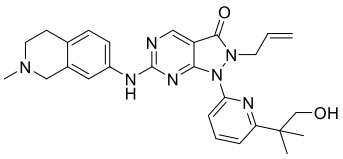

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, or a pharmaceutically acceptable salt of any of the foregoing.

19. A pharmaceutical composition comprising an effective amount of the compound of Claim 1, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier, diluent, excipient or combination thereof.

20. Use of a compound of Claim 1, or a pharmaceutically acceptable salt thereof, in the preparation for a medicament for ameliorating or treating a cancer, wherein the cancer is selected from a brain cancer, a cervicocerebral cancer, an esophageal cancer, a thyroid cancer, a small cell cancer, a non-small cell cancer, a breast cancer, a lung cancer , a stomach cancer, a gallbladder/bile duct cancer, a liver cancer, a pancreatic cancer, a colon cancer, a rectal cancer, an ovarian cancer, a choriocarcinoma, an uterus body cancer, an uterocervical cancer, a renal pelvis/ureter cancer, a bladder cancer, a prostate cancer, a penis cancer, a testicular cancer, a fetal cancer, Wilms' cancer, a skin cancer, malignant melanoma, a neuroblastoma, an osteosarcoma, an Ewing's tumor, a soft part sarcoma, an acute leukemia, a chronic lymphatic leukemia, a chronic myelocytic leukemia, polycythemia vera, a malignant lymphoma, multiple myeloma, a Hodgkin's lymphoma, and a non-Hodgkin’s lymphoma.

21. Use of a compound of Claim 1, or a pharmaceutically acceptable salt thereof, in the preparation for a medicament for inhibiting replication of a malignant growth or a tumor, wherein the malignant growth or tumor is due to a cancer selected from a brain cancer, a cervicocerebral cancer, an esophageal cancer, a thyroid cancer, a small cell cancer, a non-small cell cancer, a breast cancer, a lung cancer , a stomach cancer, a gallbladder/bile duct cancer, a liver cancer, a pancreatic cancer, a colon cancer, a rectal cancer, an ovarian cancer, a choriocarcinoma, an uterus body cancer, an uterocervical cancer, a renal pelvis/ureter cancer, a bladder cancer, a prostate cancer, a penis cancer, a testicular cancer, a fetal cancer, Wilms' cancer, a skin cancer, malignant melanoma, a neuroblastoma, an osteosarcoma, an Ewing's tumor, a soft part sarcoma, an acute leukemia, a chronic lymphatic leukemia, a chronic myelocytic leukemia, polycythemia vera, a malignant lymphoma, multiple myeloma, a Hodgkin's lymphoma, and a non-Hodgkin’s lymphoma.

22. Use of a compound of Claim 1, or a pharmaceutically acceptable salt thereof, in the preparation for a medicament for inhibiting the activity of WEE1 of a cancer cell, wherein the cancer cell is from a cancer selected from a brain cancer, a cervicocerebral cancer, an esophageal cancer, a thyroid cancer, a small cell cancer, a non-small cell cancer, a breast cancer, a lung cancer , a stomach cancer, a gallbladder/bile duct cancer, a liver cancer, a pancreatic cancer, a colon cancer, a rectal cancer, an ovarian cancer, a choriocarcinoma, an uterus body cancer, an uterocervical cancer, a renal pelvis/ureter cancer, a bladder cancer, a prostate cancer, a penis cancer, a testicular cancer, a fetal cancer, Wilms' cancer, a skin cancer, malignant melanoma, a neuroblastoma, an osteosarcoma, an Ewing's tumor, a soft part sarcoma, an acute leukemia, a chronic lymphatic leukemia, a chronic myelocytic leukemia, polycythemia vera, a malignant lymphoma, multiple myeloma, a Hodgkin's lymphoma, and a non-Hodgkin’s lymphoma.

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