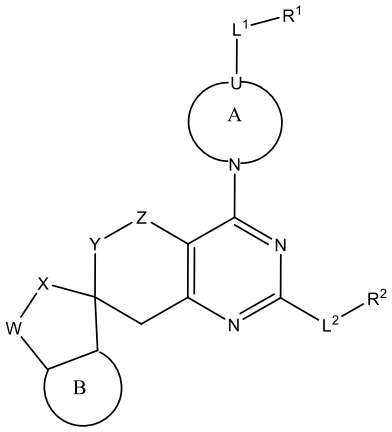
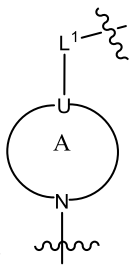
Claims

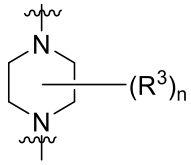
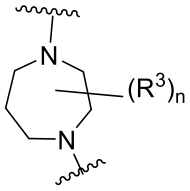
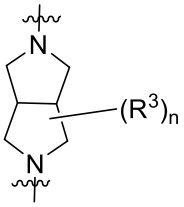
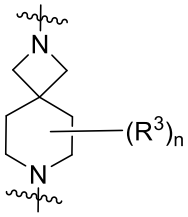
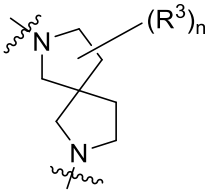
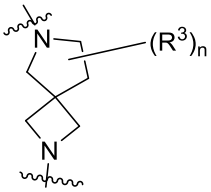
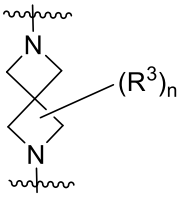
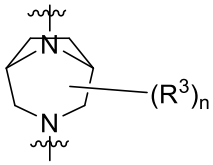
1. A compound of formula I, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers, tautomers, cis-trans isomers, solvates, polymorphs, deuterated compounds, or combinations thereof,



I

wherein,

the moiety represented by  is selected from the group consisting of:

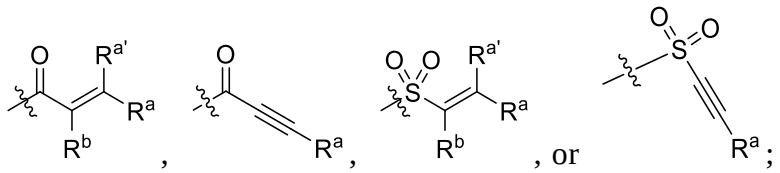
, , , , , , , and ;

n represents the number of R^3, and n is 0, 1, 2 or 3;

each R^3 is independently oxo, C_{1-3} alkyl, C_{2-4} alkenyl, C_{2-4} alkynyl, cyano, $-C(O)OR^4$, $-CON(R^4)_2$, or $-N(R^4)_2$, wherein the C_{1-3} alkyl is optionally substituted by cyano, halogen, $-OR^4$, or $-N(R^4)_2$;

each R^4 is independently hydrogen or C_{1-3} alkyl;

R^1 is



wherein,

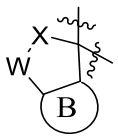
R^a is hydrogen, halogen, optionally substituted C_{1-3} alkyl, $-N(R^5)_2$, optionally substituted 4-6 membered saturated heterocyclyl, C_{1-3} alkoxy, C_{1-3} alkylthio or acetyl, wherein the substituents for optionally substituted described in R^a is selected from the group consisting of: methyl, ethyl, $-N(R^5)_2$, halogen, C_{1-3} alkoxy, and 4-6 membered saturated heterocyclyl;

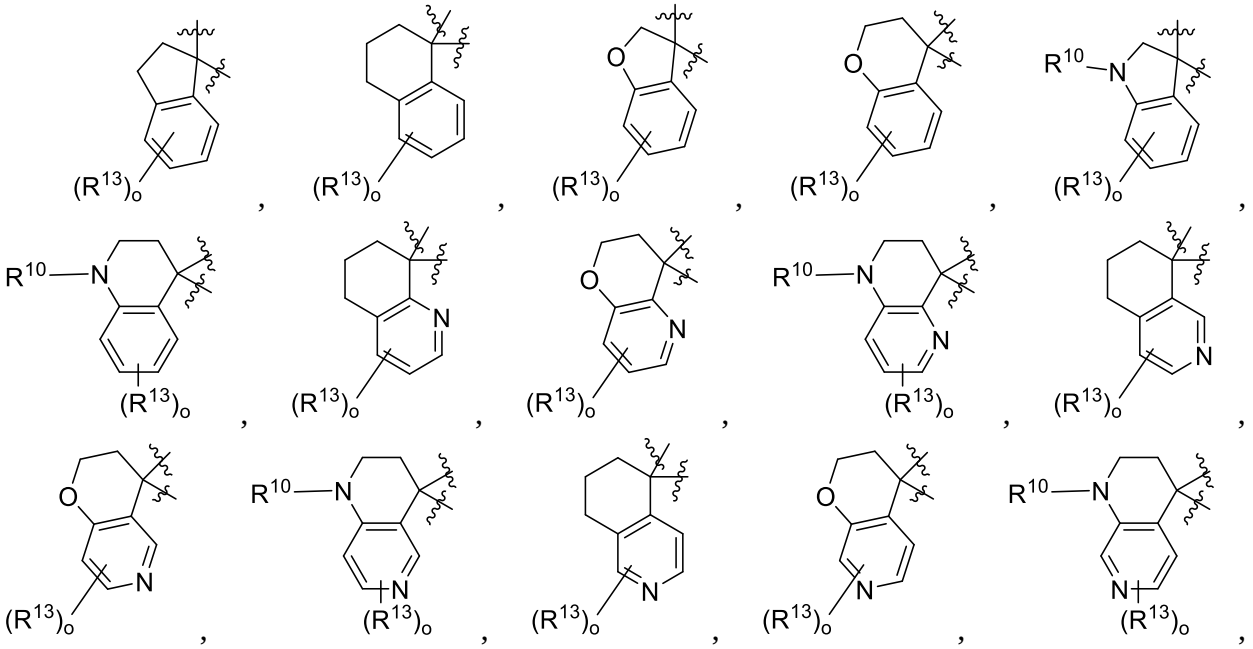
each R^5 is independently hydrogen or C_{1-3} alkyl;

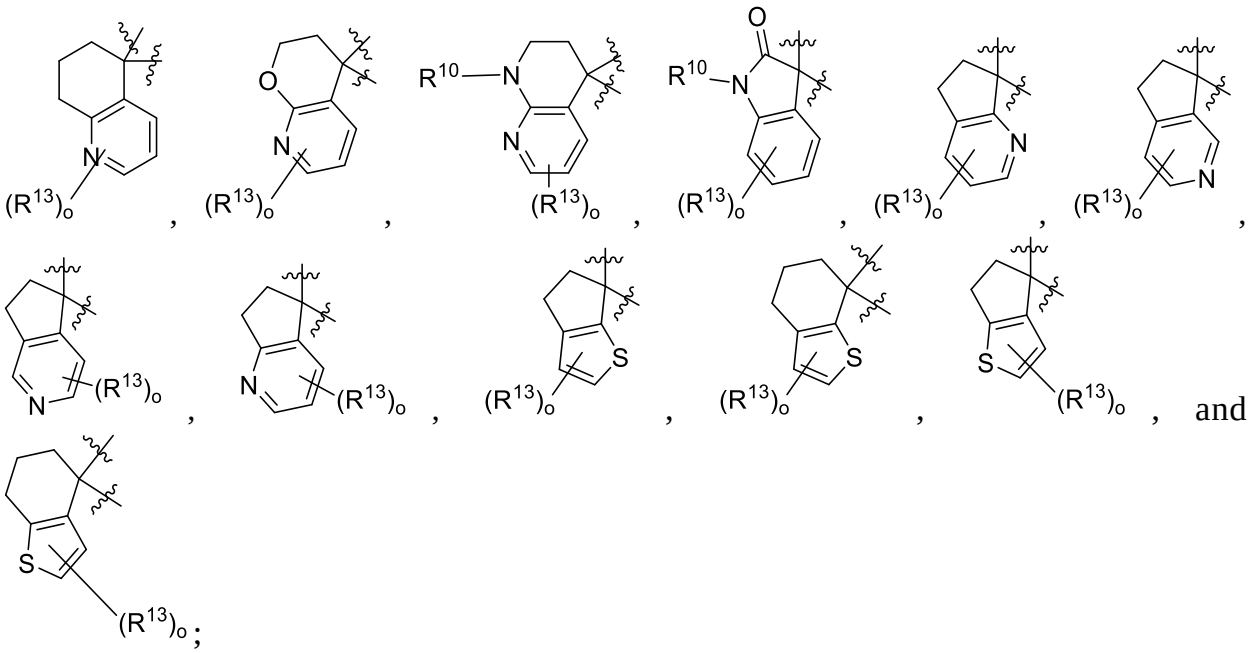
$R^{a'}$ and R^b are independently hydrogen, halogen or C_{1-3} alkyl;

L^2 is -O-, -S-, or $-NR^6$-, wherein, R^6 is hydrogen or C_{1-4} alkyl;

R^2 is optionally substituted C_{1-4} alkyl; wherein the substituents for optionally substituted described in R^2 is selected from: optionally substituted 3-8 membered saturated or unsaturated carbocyclyl, and optionally substituted 4-8 membered saturated and unsaturated heterocyclyl; the substituent for optionally substituted is selected from the group consisting of halogen, C_{1-3} alkyl, C_{1-3} haloalkyl, hydroxy, cyano, oxo, C_{1-3} alkoxy, or C_{1-4} alkyl sulfoxide;

the spiro ring represented by  is selected from the group consisting of:





R^{10} is independently hydrogen or C_{1-3} alkyl;

o represents the number of R^{13}, which is 0, 1, 2 or 3;

each R^{13} is independently selected from halogen, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{3-6} carbocyclyl, C_{1-3} alkoxy, and C_{1-3} haloalkoxy;

Y is $-NR^{14}-$, wherein R^{14} is hydrogen, C_{1-6} alkyl, or C_{1-6} haloalkyl;

Z is $-(CR^{15}R^{16})-$, wherein R^{15} and R^{16} are independently hydrogen or C_{1-3} alkyl.

2. The compound of Formula I according to claim 1, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers, tautomers, cis-trans isomers, solvates, polymorphs, deuterated compounds, or combinations thereof, wherein

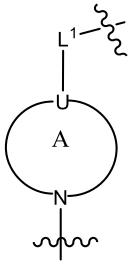
R^a is hydrogen, fluorine, or optionally substituted C_{1-3} alkyl;

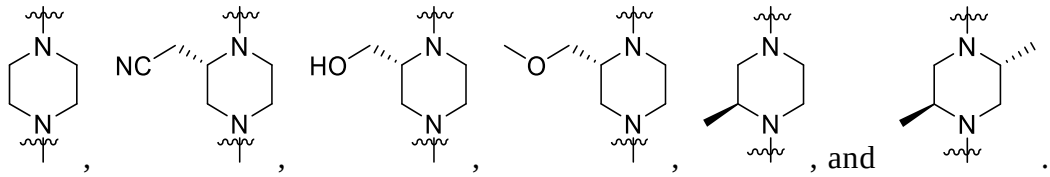
wherein the substituents for optionally substituted described in R^a are selected from the group consisting of methyl, ethyl, $-N(R^5)_2$, halogen, and C_{1-3} alkoxy;

each R^5 is independently hydrogen or C_{1-3} alkyl;

$R^{a'}$ and R^b are independently hydrogen, fluorine or C_{1-3} alkyl.

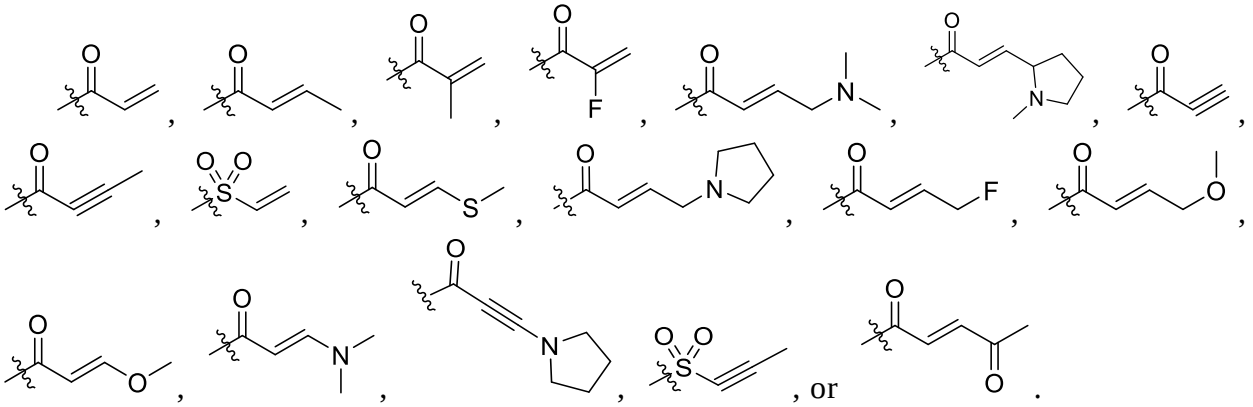
3. The compound of Formula I according to claim 1 or 2, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers, tautomers, cis-trans isomers, solvates, polymorphs, deuterated compounds, or combinations thereof, wherein

the moiety represented by  in formula I is selected from the group consisting of:

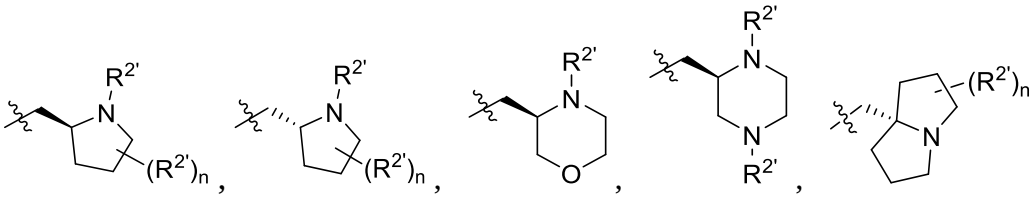


4. The compound of Formula I according to claim 1, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers, tautomers, cis-trans isomers, solvates, polymorphs, deuterated compounds, or combinations thereof, wherein

R^1 is

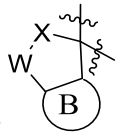


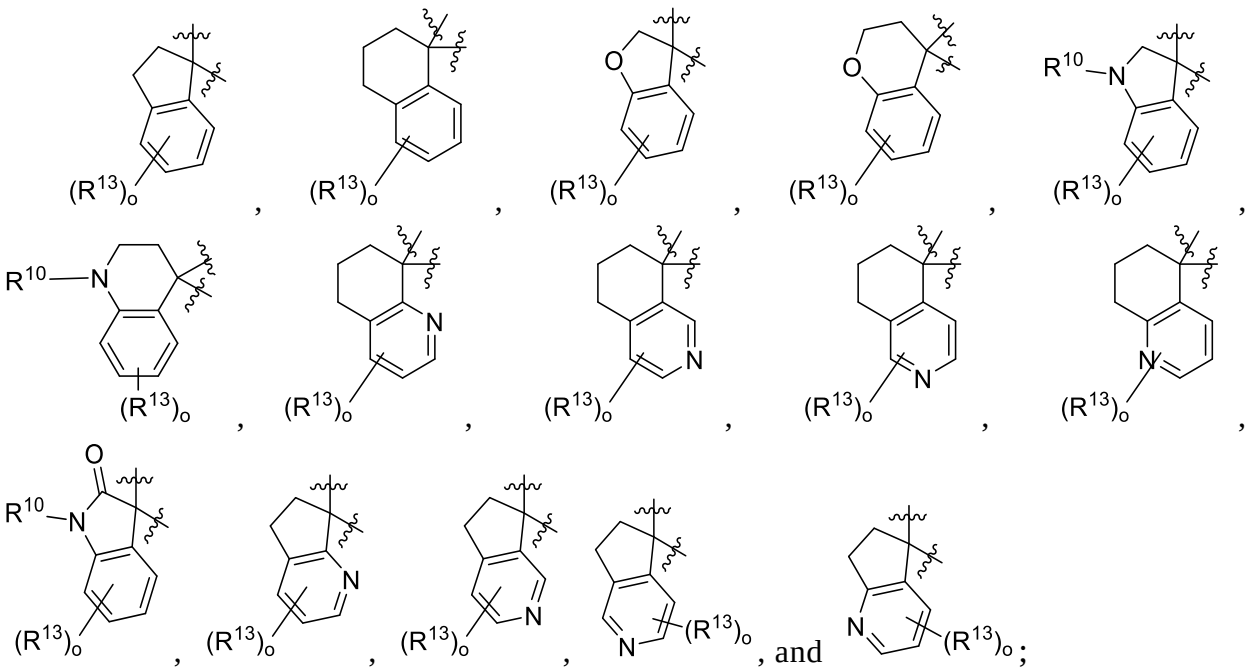
5. The compound of Formula I according to claim 1, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers, tautomers, cis-trans isomers, solvates, polymorphs, deuterated compounds, or combinations thereof, wherein

R^2 is 

wherein n represents the number of $R^{2'}$, and selected from: 0, 1, 2 and 3; each $R^{2'}$ is independently halogen, C_{1-3} alkyl, C_{1-3} haloalkyl, hydroxy, cyano, oxo, C_{1-3} alkoxy, or C_{1-4} alkyl sulfoxide.

6. The compound according to any of claims 1-5, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers, tautomers, cis-trans isomers, solvates, polymorphs, deuterated compounds, or combinations thereof, wherein

the spiro ring represented by  is selected from the group consisting of:



; and

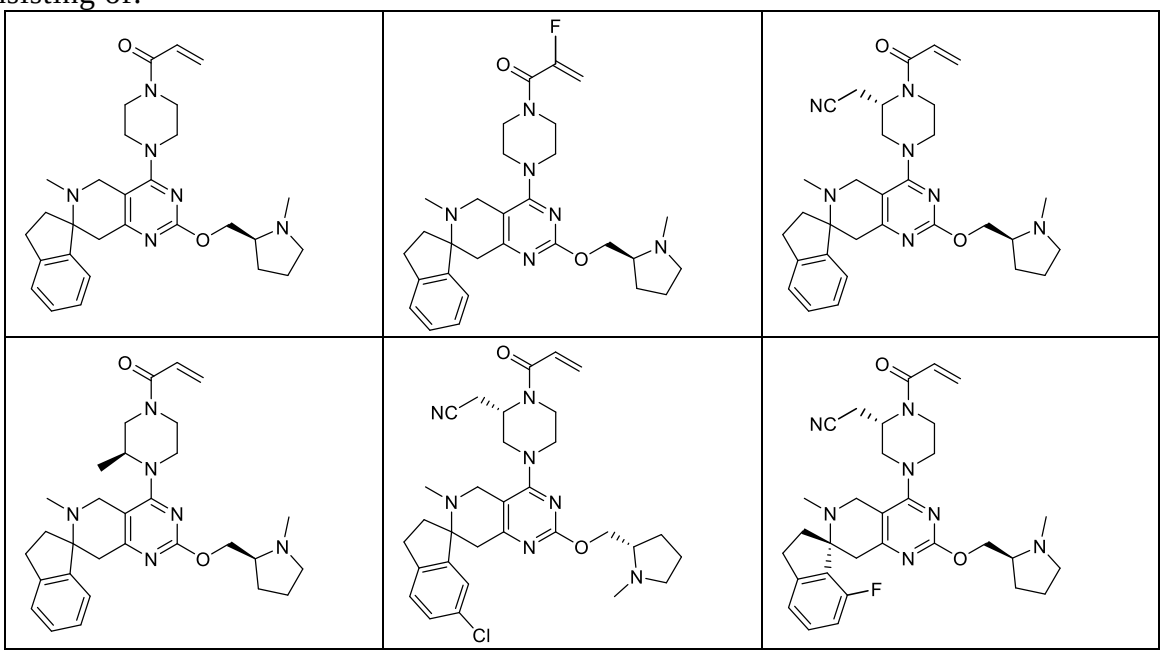
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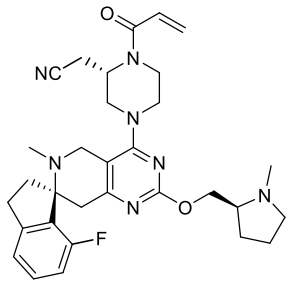
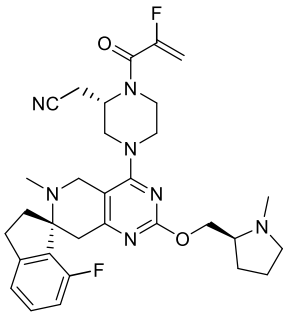
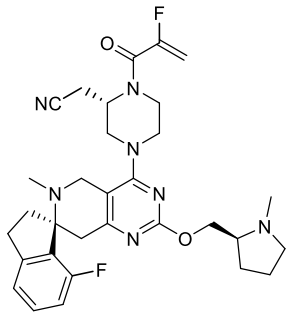
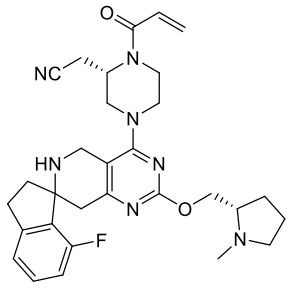
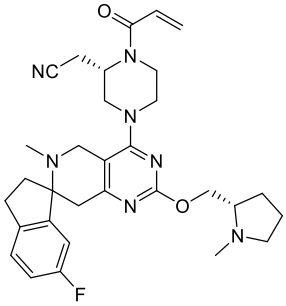
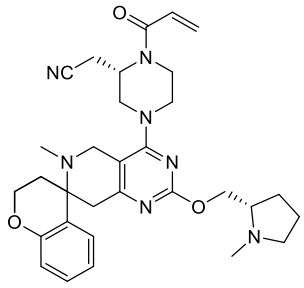
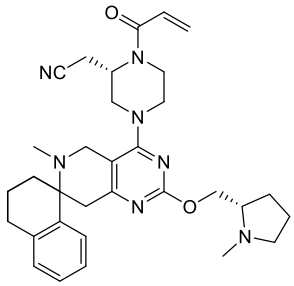
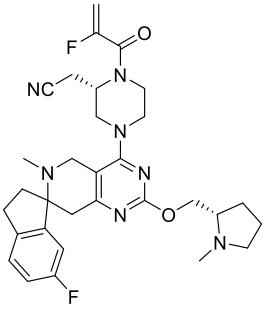
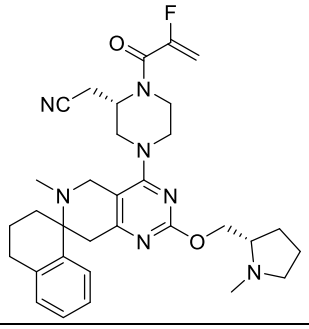
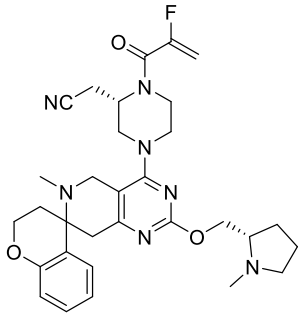
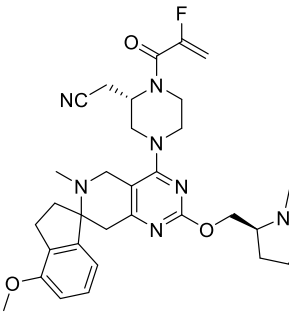
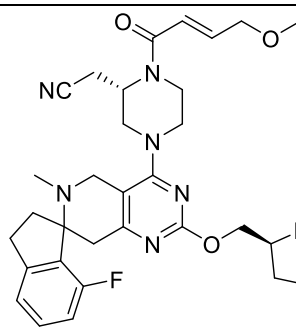
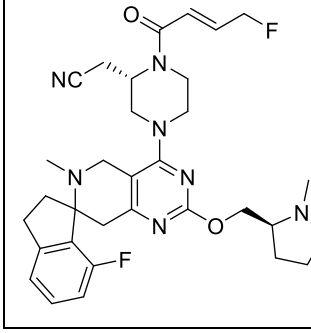
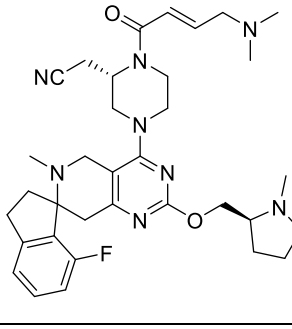
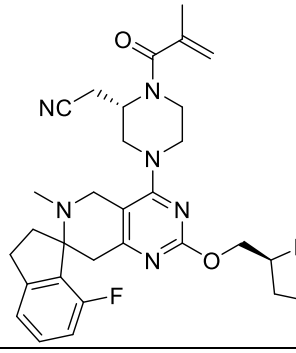
R^{10} is independently hydrogen or C_{1-3} alkyl;

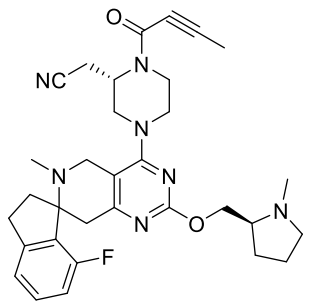
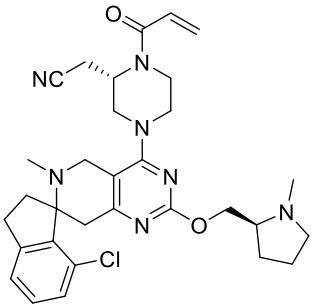
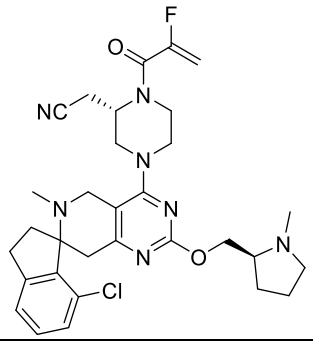
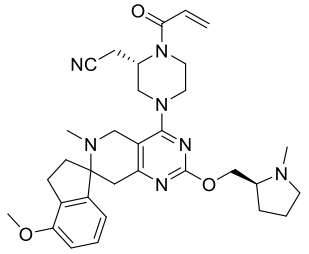
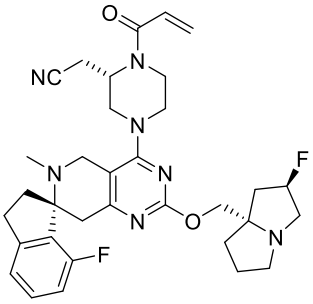
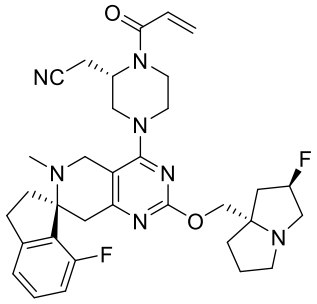
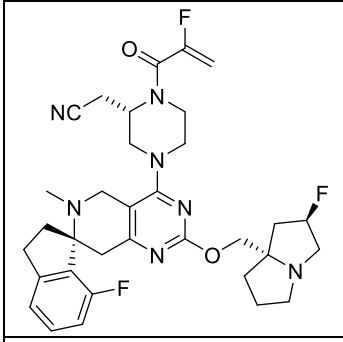
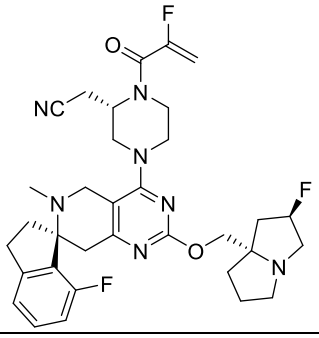
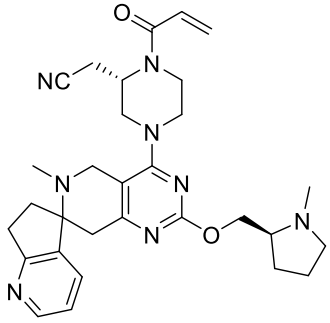
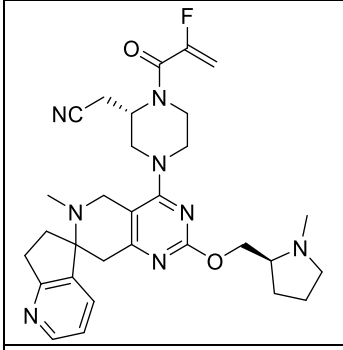
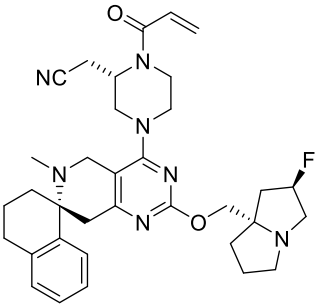
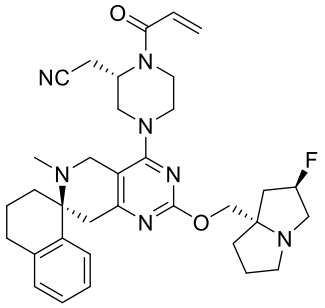
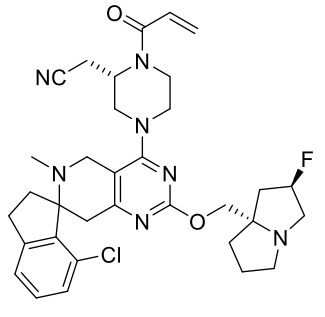
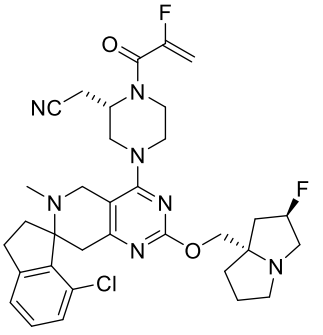
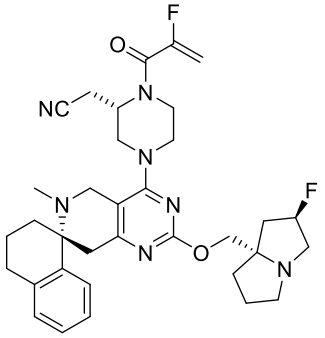
o represents the number of R^{13}, which is 0, 1, 2 or 3;

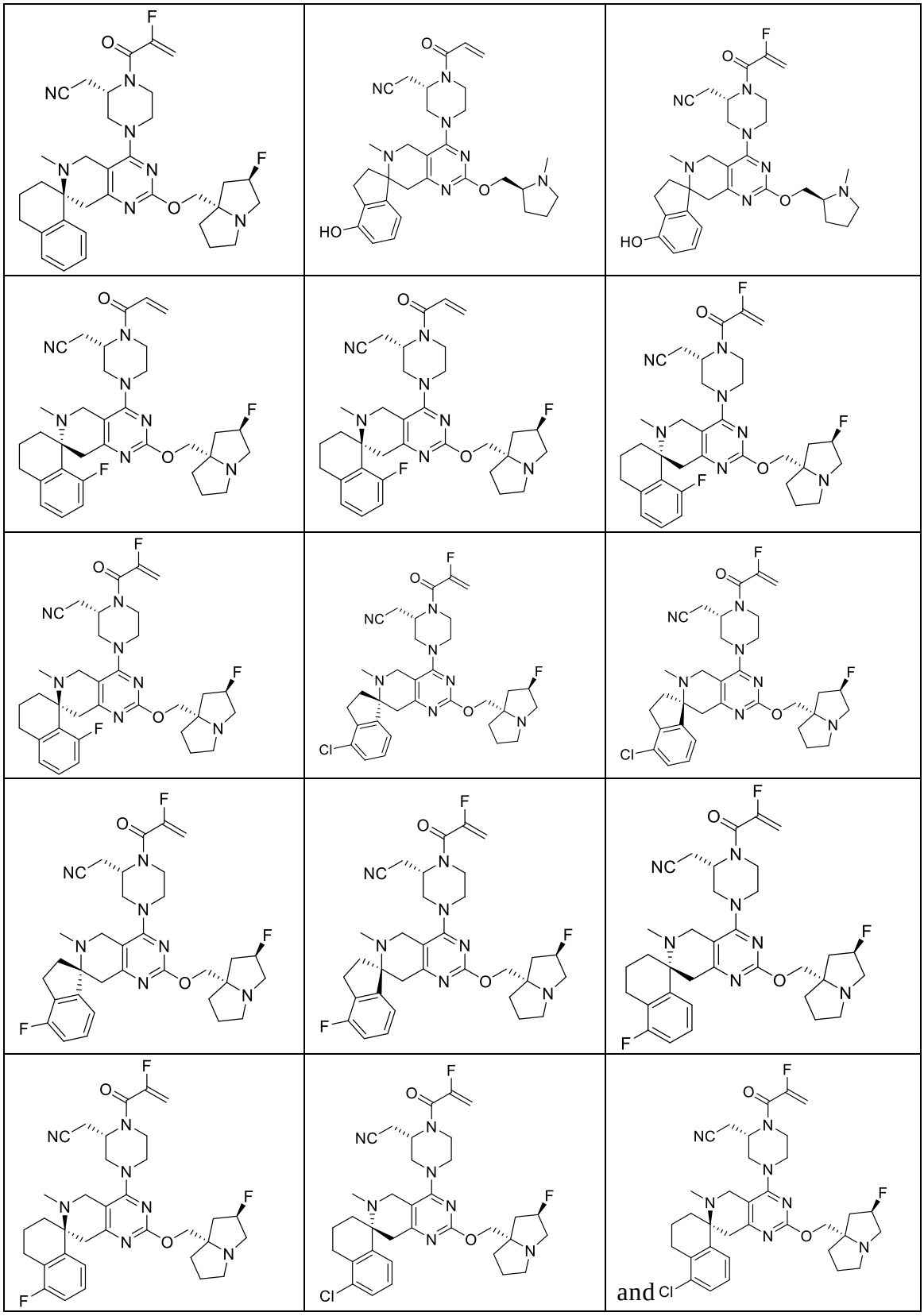
each R^{13} is independently selected from halogen, C_{1-6} alkyl, C_{1-6} haloalkyl, C_{3-6} carbocyclyl, C_{1-3} alkoxy, and C_{1-3} haloalkoxy.

7. The compound according to claim 1, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers, tautomers, cis-trans isomers, solvates, polymorphs, deuterated compounds, or combinations thereof, wherein, the compound is selected from the group consisting of:





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8. A pharmaceutical composition, comprising:

(1) a therapeutically effective amount of one or more of the compounds according to any of claims 1-7, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers,

tautomers, cis-trans isomers, solvates, polymorphs, and deuterated compounds thereof as active ingredients; and

(2) optionally, pharmaceutically acceptable excipients.

9. A use of the compound according to any one of claims 1 to 7, or pharmaceutically acceptable salts thereof, enantiomers, diastereomers, tautomers, cis-trans isomers, solvates, polymorphs or deuterated compounds thereof, or the pharmaceutical composition according to claim 8 in the preparation of medicaments for preventing or treating cancer mediated by KRAS G12C mutation.

10. The use according to claim 9, wherein, the cancer is selected from the group consisting of lung cancer, pancreatic cancer, colorectal cancer, leukemia, Ewing's sarcoma, breast cancer, prostate cancer, T-cell lymphoma, B-cell lymphoma, malignant rhabdomyoma, synovial sarcoma, endometrioma, gastric cancer, liver cancer, renal cancer, melanoma, ovarian cancer, brain glioma, cholangiocarcinoma, nasopharyngeal carcinoma, cervical cancer, head and neck cancer, esophageal cancer, thyroid cancer and bladder cancer.

11. The use according to claim 9, wherein, the cancer is selected from non-small cell lung cancer, pancreatic cancer, and colorectal cancer.