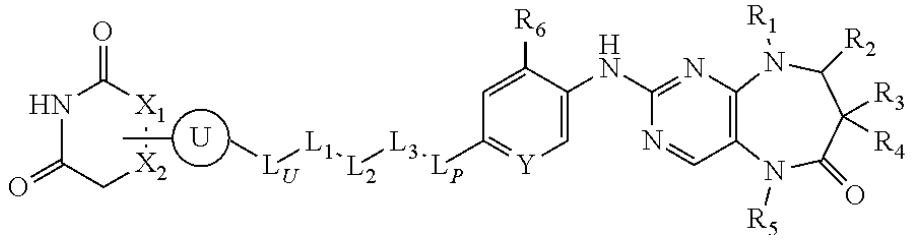
【CLAIMS】

【Claim 1】

A compound represented by the following Formula I:

Formula I



or a pharmaceutically acceptable salt or stereoisomer thereof, wherein:

X_1 is CH, $-CH_2-$, or N;

X_2 is CH, $-CH_2-$, or N;

ring U is phenylene or 5- or 6-membered heteroarylene;

wherein the phenylene or 5- or 6-membered heteroarylene is linked to the X_1 or X_2; and

wherein the phenylene or 5- or 6-membered heteroarylene is optionally substituted with one or more independently selected R_U substituents;

each R_U is independently halo, C_{1-4}alkyl, C_{1-4}haloalkyl, C_{1-4}aminoalkyl, C_{1-4}hydroxyalkyl, or OC_{1-4}alkyl;

L_U is a bond, $-\{CH_2\}_x-$, $-\{CH_2\}xNH-$, $-\{CH_2\}_xO-$, $-C\{O)-$, or phenylene;

L_1 is a bond or heterocycloalkylene;

wherein the heterocycloalkylene contains at least one nitrogen ring heteroatom; and

wherein the heterocycloalkylene is optionally substituted with one or more substituents independently selected from halo, C_{1-4}alkyl, C_{1-4}haloalkyl, OH, OC_{1-4}alkyl, or =O;

L_2 is $-(CH_2)_{y1}-$, $-(CD_2)_{y1}-$, $-(CH2)_{y2}-C(O)-(CH_2)_{y3}-$, $-(CH_2)_{y2}-NH-(CH_2)_{y3}-$, or $-(CH_2)_{y2}-N(C_{1-4}alkyl)-(CH_2)_{y3}-$;

L_3 is a bond, cycloalkylene, or heterocycloalkylene;

wherein the heterocycloalkylene contains at least one nitrogen ring heteroatom; and

wherein the cycloalkylene or heterocycloalkylene is optionally substituted with one or more substituents independently selected from halo, C_{1-4}alkyl, or C_{1-4}haloalkyl;

L_P is $-(CH_2)_p-NH-C(O)-$ or $-(CH_2)_p-O-C(O)-$, wherein $-C(O)-$ of the L_P is bonded to the ring bearing R_6;

p is 0, 1, or 2;

x is 0, 1, 2, 3, or 4;

y_1 is 0, 1, 2, 3, 4, 5, or 6;

y_2 is 0, 1, 2, 3, 4, 5, or 6;

y_3 is 0, 1, 2, 3, 4, 5, or 6;

z is 0, 1, 2, 3, 4, 5, or 6;

Y is CR_7 or N;

R_6 is halo, C_{1-4}alkyl, C_{1-4}haloalkyl, C_{1-4}aminoalkyl, C_{1-4}hydroxyalkyl, or OC_{1-4}alkyl:

R_7 is H or halo;

R_1 is C_{1-4}alkyl;

R_2 is H or C_{1-4}alkyl, or

R_1 and R_2, taken together with the carbon and nitrogen atoms to which they are attached, form a 5- or 6- membered ring;

R_3 is H, halo, or C_{1-4}alkyl;

R_4 is H, halo , or C_{1-4}alkyl; or

R_3 and R_4, taken together with the carbon atom to which they are attached, form a 3- to 6- membered ring; and

R_5 is C_{1-4}alkyl.

【Claim 2】

The compound according to claim 1, or a pharmaceutically acceptable salt or stereoisomer thereof, wherein;

ring U is phenylene, pyrazolylene, pyridinylene, or pyrimidinylene;

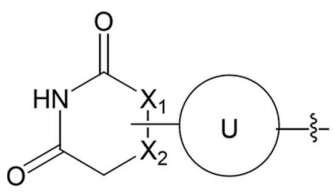
wherein the phenylene, pyrazolylene, pyridinylene, or pyrimidinylene is linked to X_1 or X_2; and

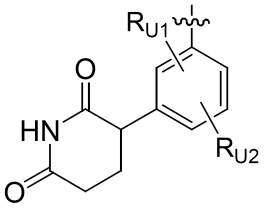
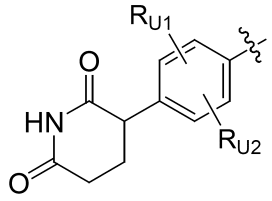
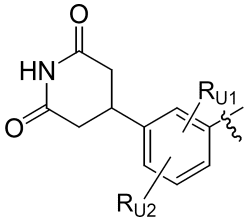
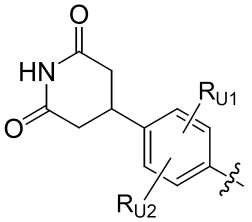
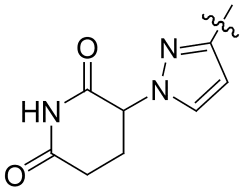
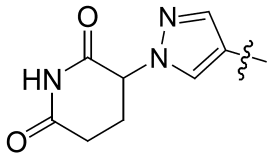
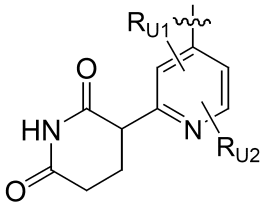
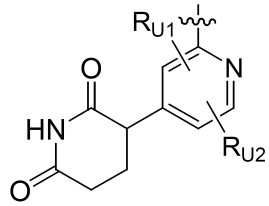
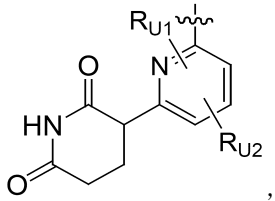
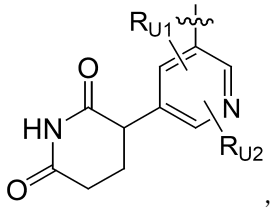
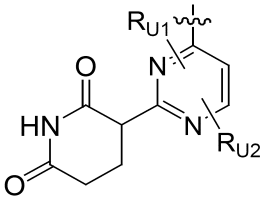
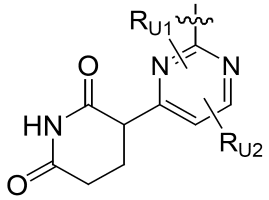
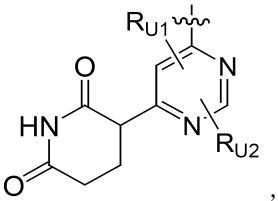
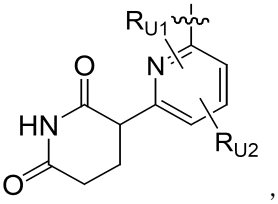
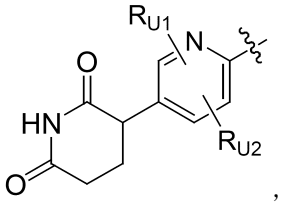
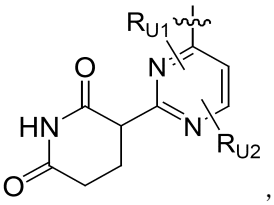
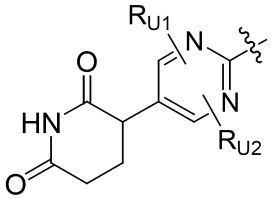
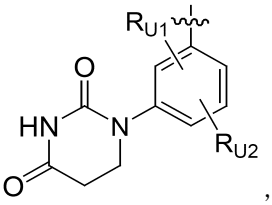
wherein the phenylene, pyrazolylene, pyridinylene, or pyrimidinylene is optionally substituted with one or more independently selected R_U substituents; and

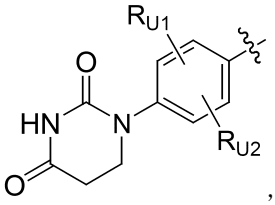
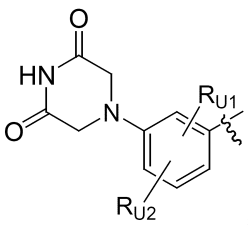
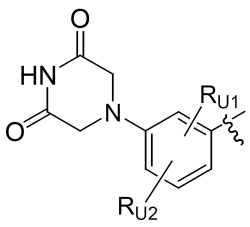
each R_U is independently halo, C_{1-4}alkyl, C_{1-4}haloalkyl, or OC_{1-4}alkyl.

【Claim 3】

The compound according to claim 1, or the pharmaceutically acceptable salt or stereoisomer thereof, wherein:



is  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  ,  .

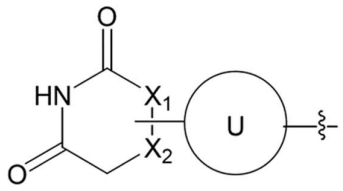
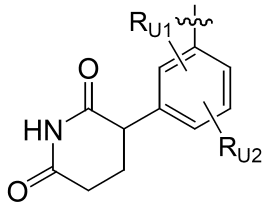
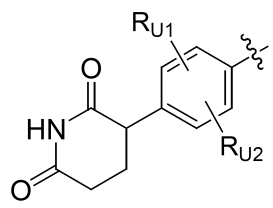
 ,  , or  ; and

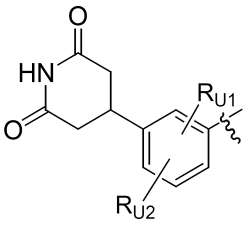
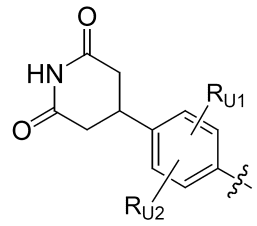
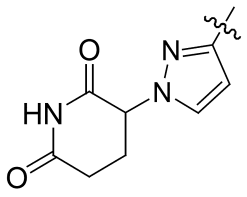
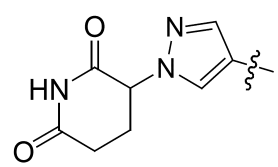
R_{U1} is halo, C_{1-4}alkyl, C_{1-4}haloalkyl or OC_{1-4}alkyl; and

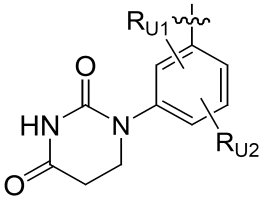
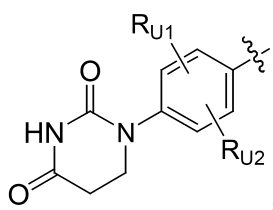
R_{U2} is halo, C_{1-4}alkyl, C_{1-4}haloalkyl or OC_{1-4}alkyl.

【Claim 4】

The compound according to claim 3, or a pharmaceutically acceptable salt or stereoisomer thereof according, wherein:,

 is  ,  ,

 ,  ,  ,  ,

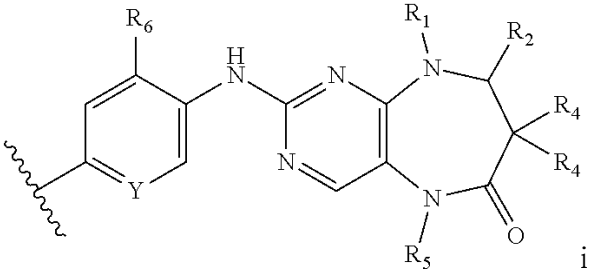
 ,or ,  ,

R_{U1} is halo, C_{1-4}alkyl, C_{1-4}haloalkyl or OC_{1-4}alkyl; and

R_{U2} is halo, C_{1-4}alkyl, $-C_{1-4}$haloalkyl or OC_{1-4}alkyl.

【Claim 5】

The compound according to claim 1or a pharmaceutically acceptable salt or stereoisomer thereof, wherein:,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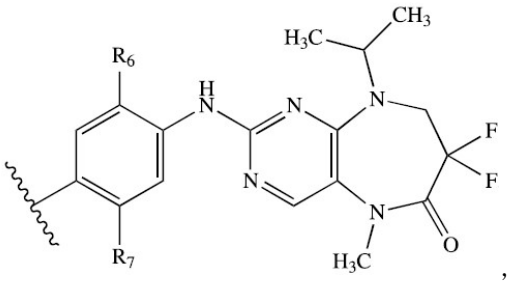
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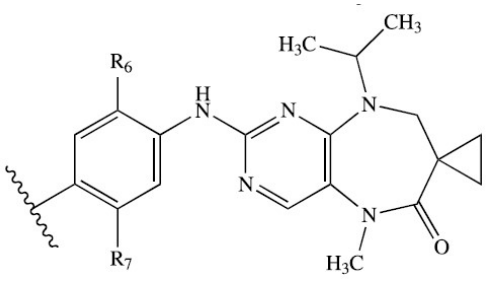
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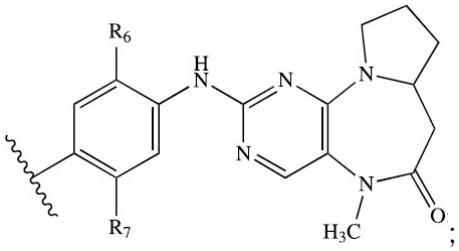

;

Y is CH, CF or N; and

R_6 is halo, C_{1-4}alkyl or OC_{1-4}alkyl.

【Claim 6】

The compound according to claim 1, or a pharmaceutically acceptable salt or stereoisomer thereof, wherein:,

L_U is a bond, $-(CH_2)x-$, $-(CH_2)xO-$, $-C(O)-$, or phenylene;

L_1 is a bond or 4- to 12-membered heterocycloalkylene;

wherein the 4- to 12-membered heterocycloalkylene is monocyclic, bridged bicyclic, or spirocyclic;

wherein the 4- to 12-membered heterocycloalkylene contains at least one nitrogen ring heteroatom;

wherein the 4- to 12-membered heterocycloalkylene is bonded to L_U or ring U via the nitrogen ring heteroatom;

wherein the 4- to 12-membered heterocycloalkylene ring is optionally substituted with one or more substituents independently selected from halo, C_{1-4}alkyl, OH, or =O;

L_2 is $-(CH_2)_{y1}-$, $-(CH_2)_{y2}-C(O)-(CH_2)_{y3}-$, $-(CH_2)_{y2}-NH-(CH_2)_{y3}-$, or $-(CH_2)_{y2}-N(C_{1-4}alkyl)-(CH_2)_{y3}-$;

L_3 is s a bond, 4- to 6-membered cycloalkylene or 4- to 12-membered

heterocycloalkylene;

wherein the 4- to 12-membered heterocycloalkylene is monocyclic, bridged bicyclic, or spirocyclic;

wherein the 4- to 12-membered heterocycloalkylene contains at least one nitrogen ring heteroatom; and

wherein the 4- to 6-membered cycloalkylene or 4- to 12-membered heterocycloalkylene is optionally substituted with one or more independently selected halo substituents;

L_P is $-(CH_2)p-NH-C(O)-$ or $-(CH_2)p-O-C(O)-$, wherein the $-C(O)-$ of L_P is bonded to the ring bearing R_6

p is 0 or 1;

x is 0 or 1;

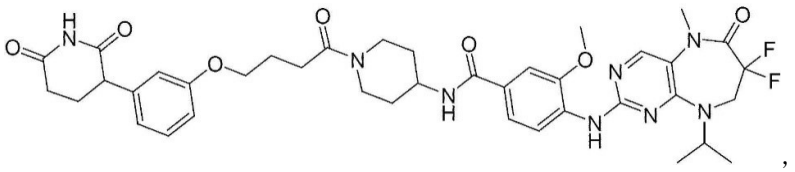
y_1 is 0, 1, 2, or 3;

y_2 is 0, 1, 2, or 3; and

y_3 is 0, 1, 2, or 3.

【Claim 7】

The compound according to claim 1, or a stereoisomer thereof, wherein the compound, or stereoisomer thereof, is selected from: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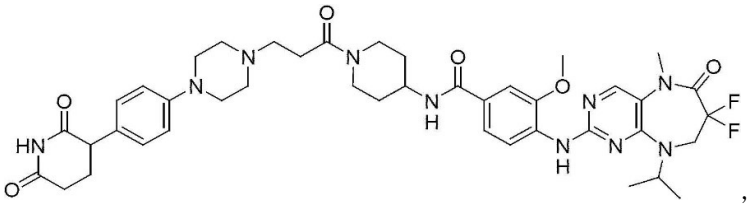
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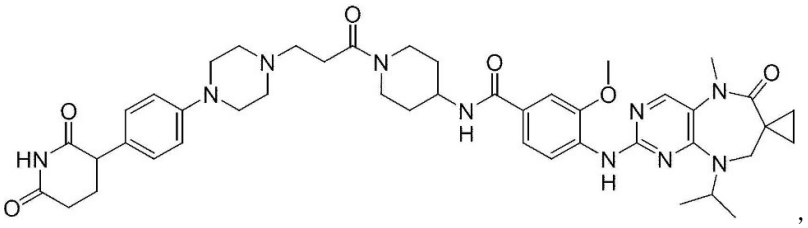
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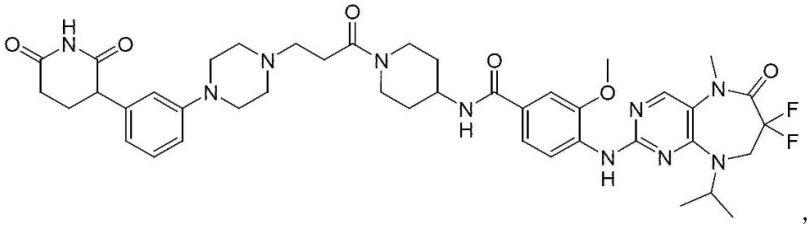
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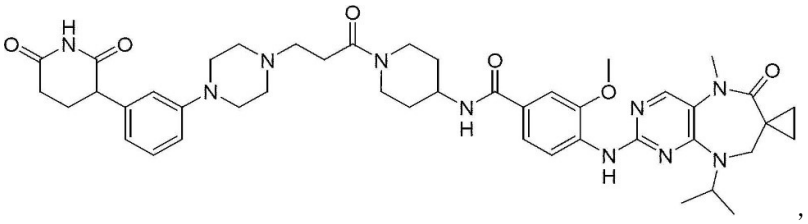
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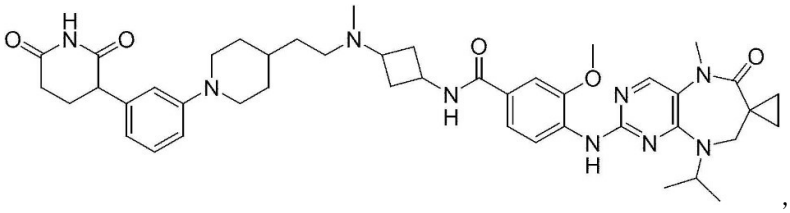

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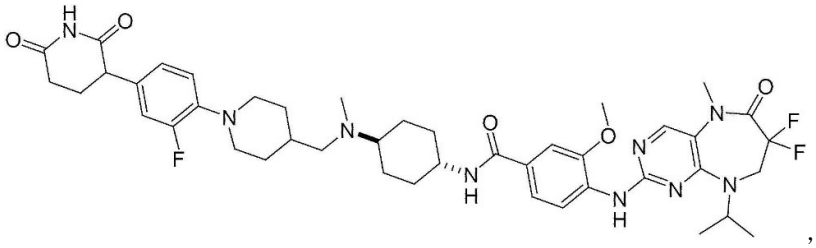

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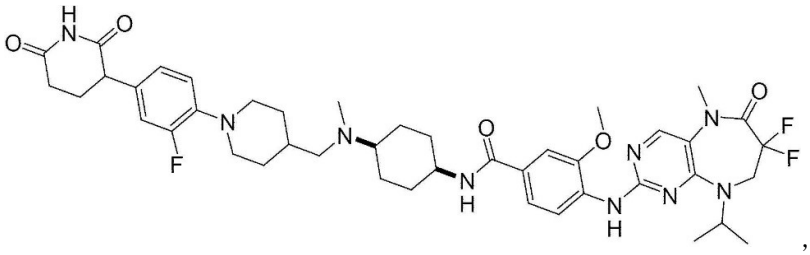

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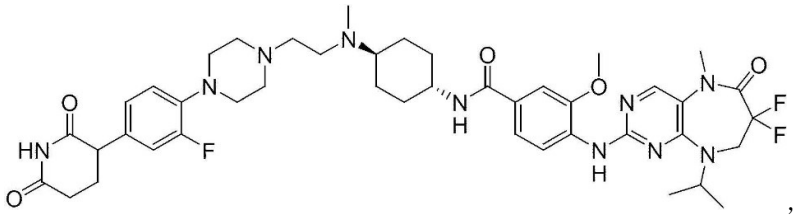

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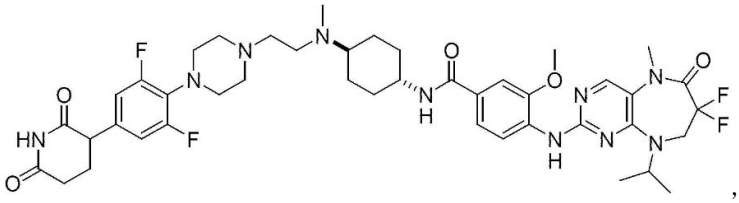

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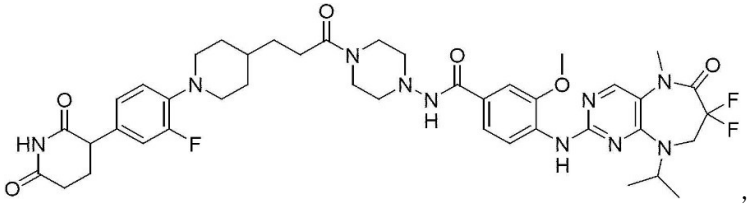

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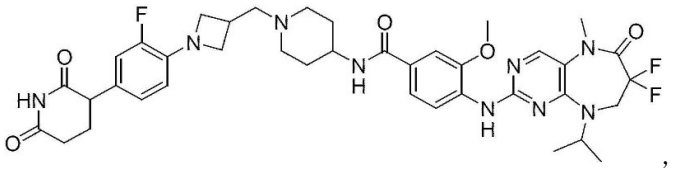

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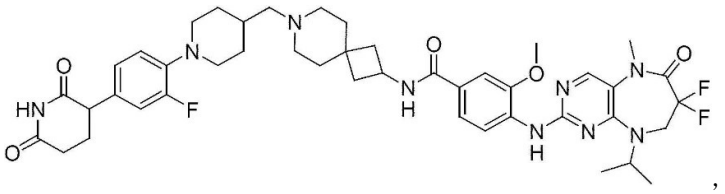

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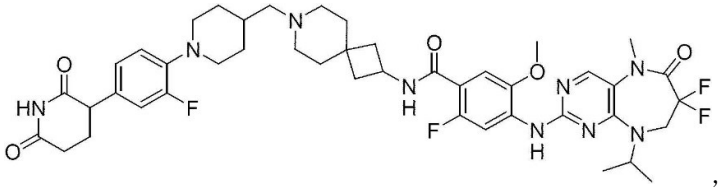

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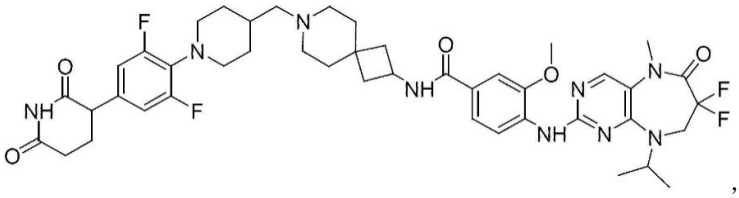

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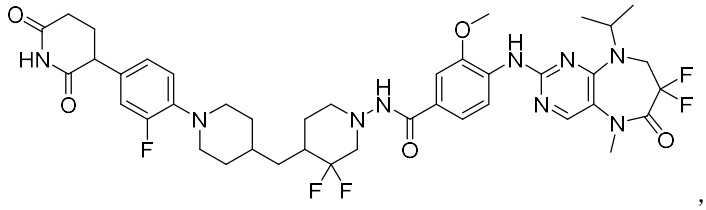

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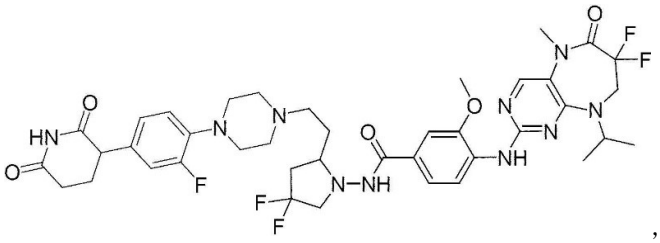

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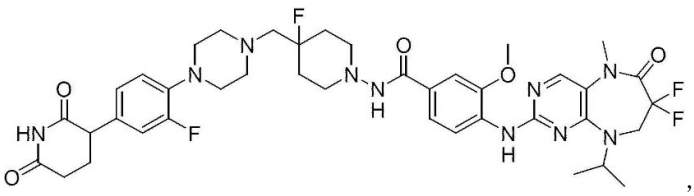

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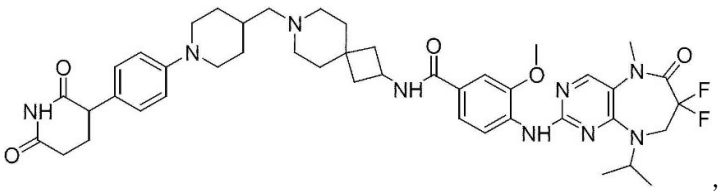

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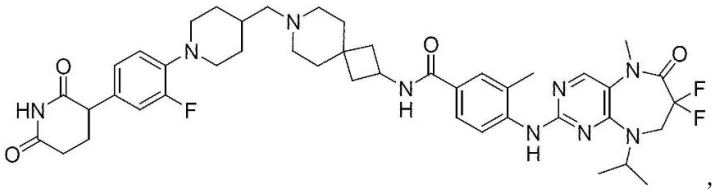

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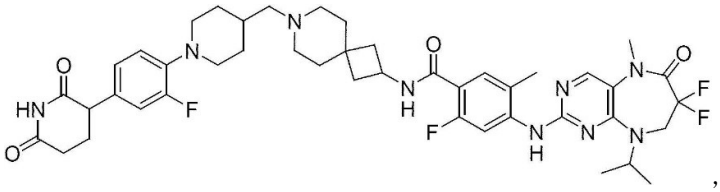

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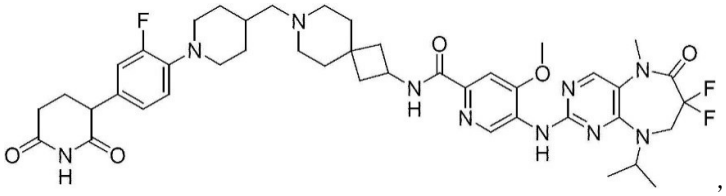

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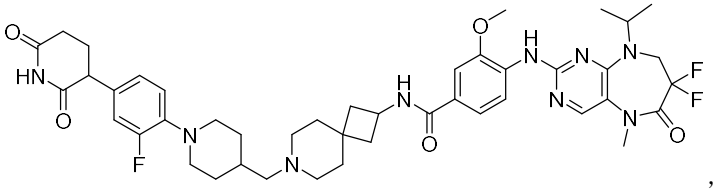

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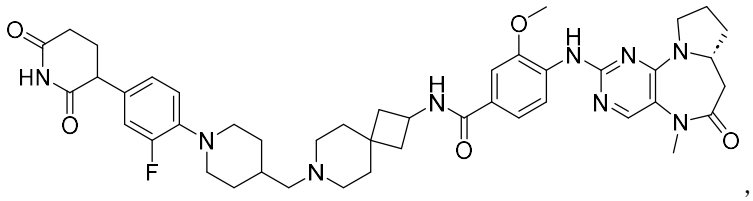

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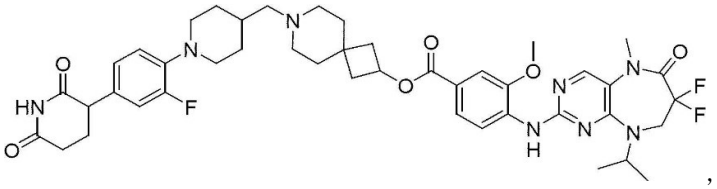

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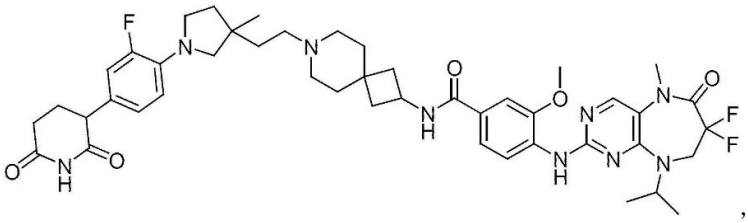

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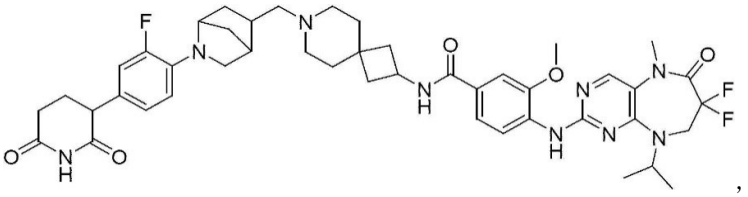

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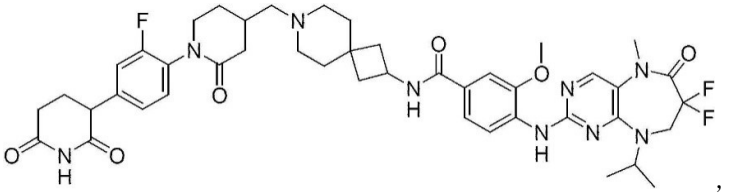

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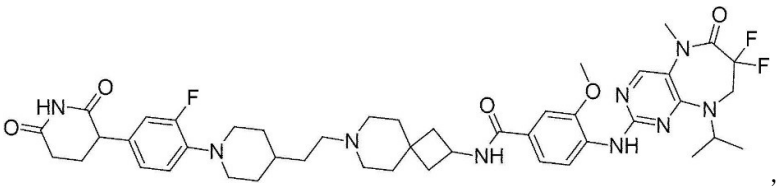

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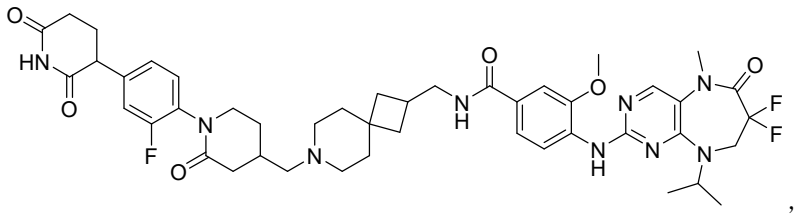

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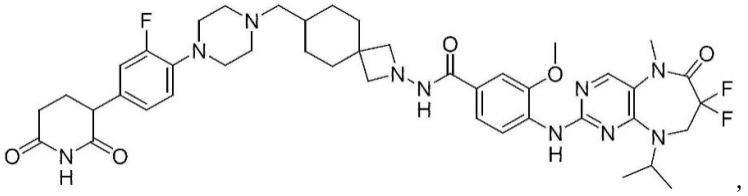

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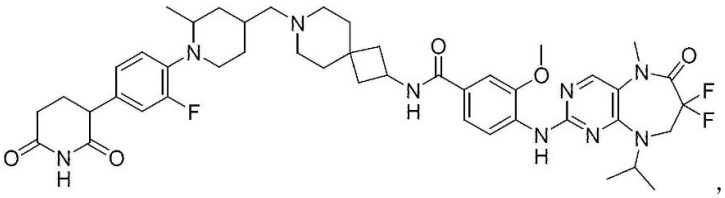

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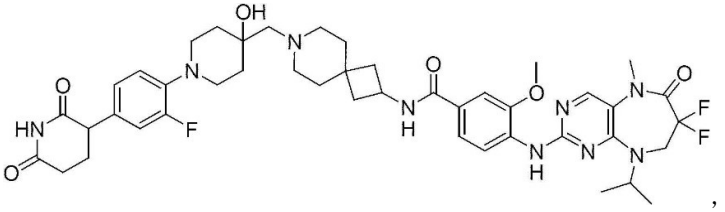

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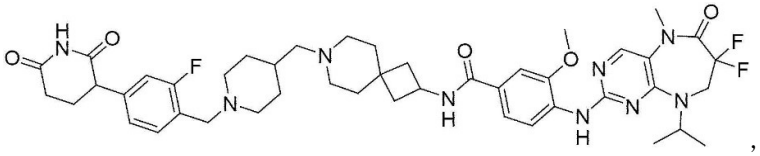

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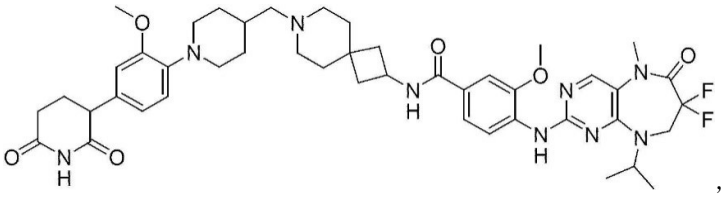

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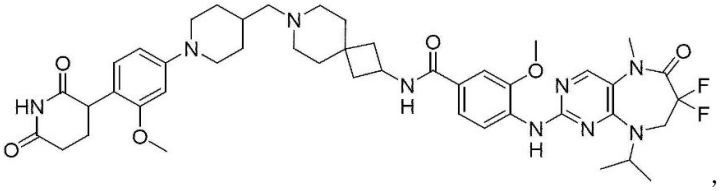

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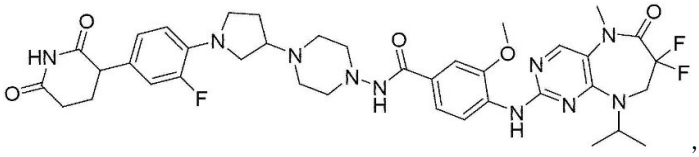

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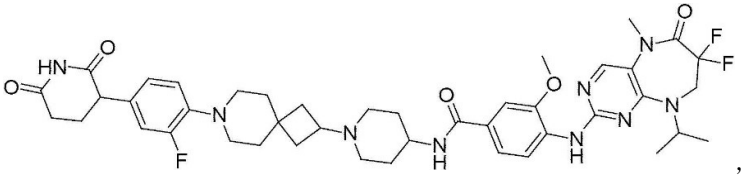

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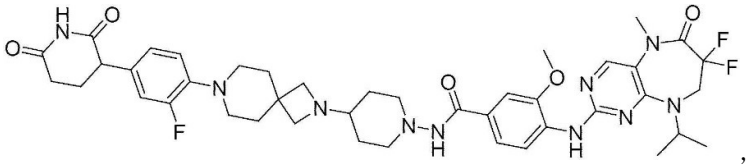

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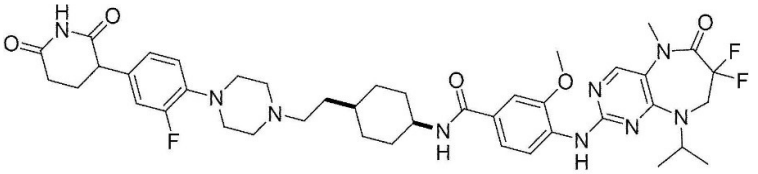

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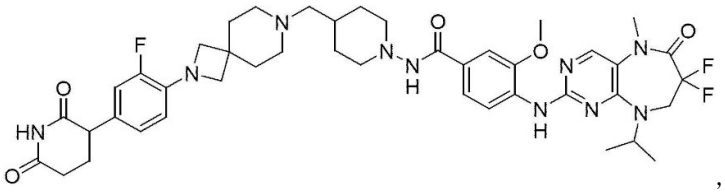

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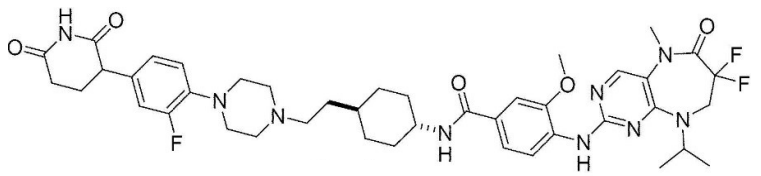

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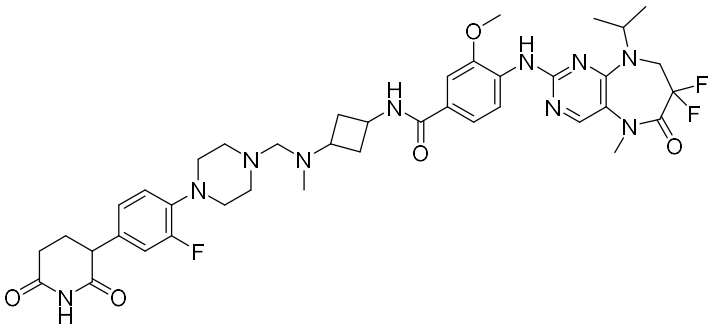

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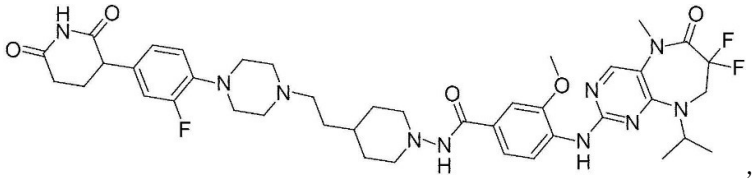

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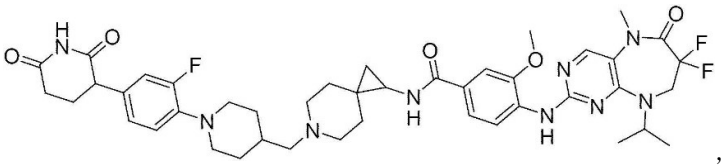

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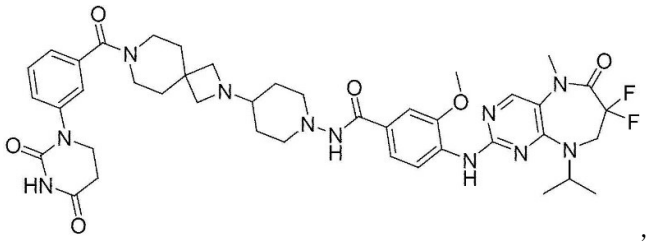

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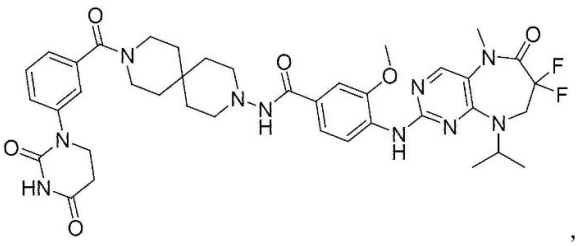

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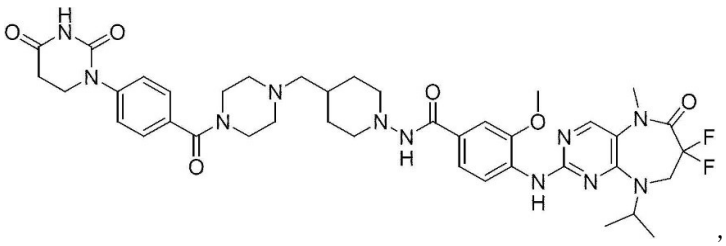

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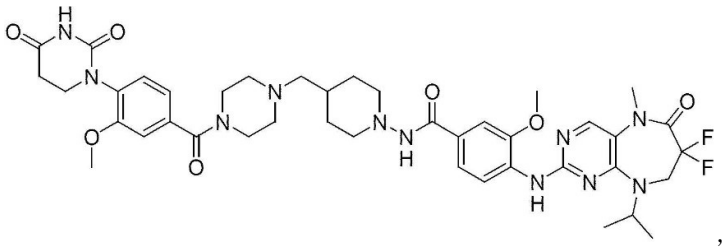

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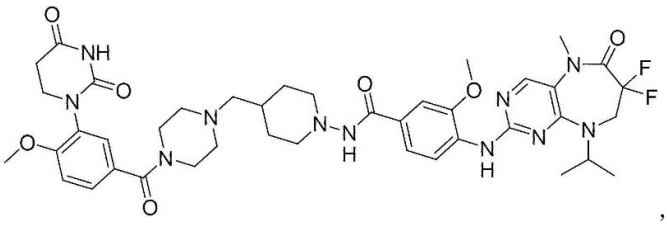

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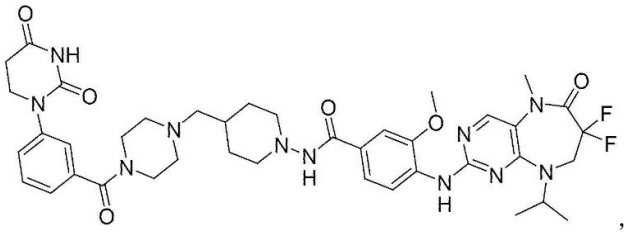

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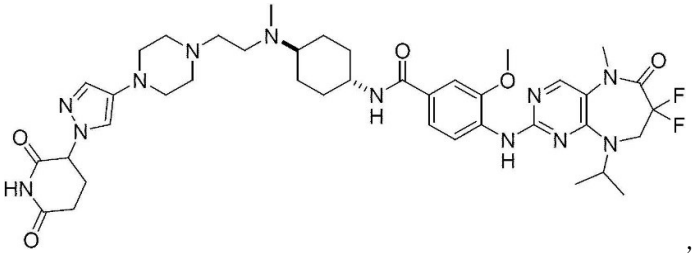

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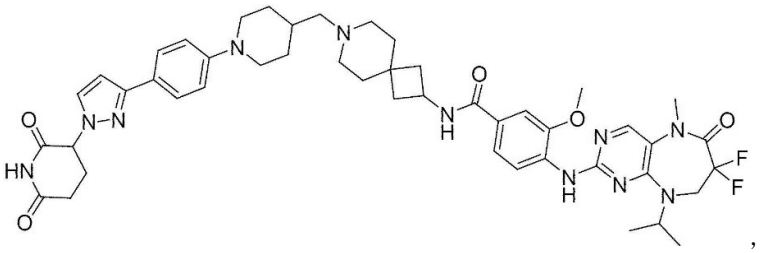

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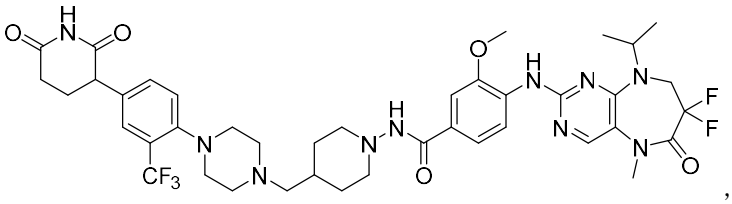

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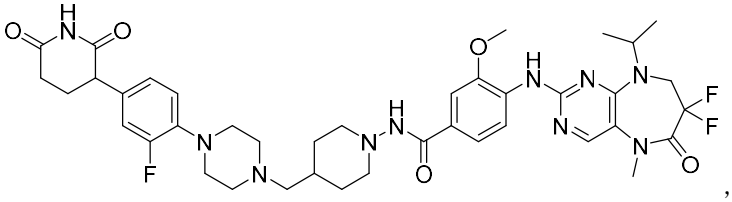

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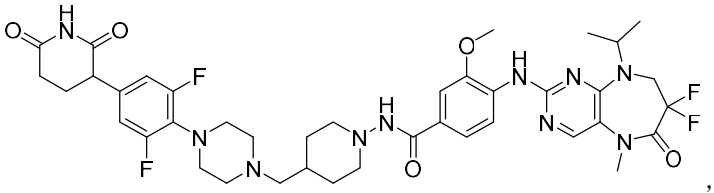

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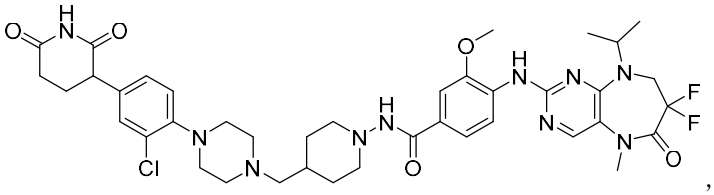

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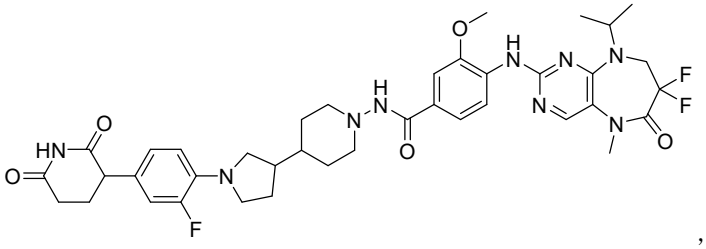

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or a pharmaceutically acceptable salt thereof.

【Claim 8】

A pharmaceutical composition comprising a pharmaceutically acceptable carrier and a compound according to claim 1, or a pharmaceutically acceptable salt or stereoisomer.

【Claim 9】

Use of a compound of any one of claims 1-7, or a pharmaceutical composition according to claim 8, in the preparation of a medicament for inducing polo-like kinase 1 (PLK1) degradation in a subject.

【Claim 10】

The use according to claim 9, wherein the PLK1-related disease is selected from the group consisting of a benign tumor, a cancer or a neurological disorder.

【Claim 11】

The use according to claim 10, wherein the benign tumor or the cancer is one or more selected from acute leukemia, adrenal cancer, adrenocorticoid tumor,

anal muscle cancer, Barrett's esophagus, bladder cancer, blood cancer, bone cancer, brain cancer, breast cancer, breast cyst, breast fibroadenoma, cervical cancer, cholangiocarcinoma, chronic leukemia, colon adenoma, colon cancer, colon polyp, colorectal cancer, endocrine cancer, endometrial cancer, esophageal cancer, gastric cancer, gastrointestinal cancer, glioblastoma, glioma, head and neck cancer, hepatocellular carcinoma, intraocular melanoma, kidney cancer, large cell lymphoma, liver cancer, liver tumor, lung adenocarcinoma, lymphocytic lymphoma, monoclonal gammopathy of undetermined significance (MGUS), monoclonal lymphocytosis, neuroblastoma, neuroendocrine cancer, neuroendocrine tumor, non-small cell lung cancer, osteosarcoma, ovarian cancer, pancreatic cancer, parathyroid cancer, peritoneal cancer, prostate cancer, rectal cancer, salivary gland cancer, skin cancer, skin melanoma, small cell lung cancer, small intestine cancer, soft tissue sarcoma, solid tumor, a squamous cell carcinoma, T cell leukemia, T cell lymphoma, thyroid cancer, urethral cancer, uterine cancer, or vulvar cancer, or a combination thereof.

【Claim 12】

The use according to claim 11, wherein the squamous cell carcinoma is lung squamous cell carcinoma.

【Claim 13】

The use according to claim 10, wherein the neurological disorder is one or more selected from Alzheimer's disease an axonal degeneration-related disorder following brain injury, an axonal degeneration-related disorder following spinal cord injury, a central nervous system disease, epilepsy, Huntington's disease, Lou Gehrig's disease, multiple sclerosis, nerve damage, a neurodegenerative disease, Parkinson's disease, senile dementia, or stroke, or a combination thereof.