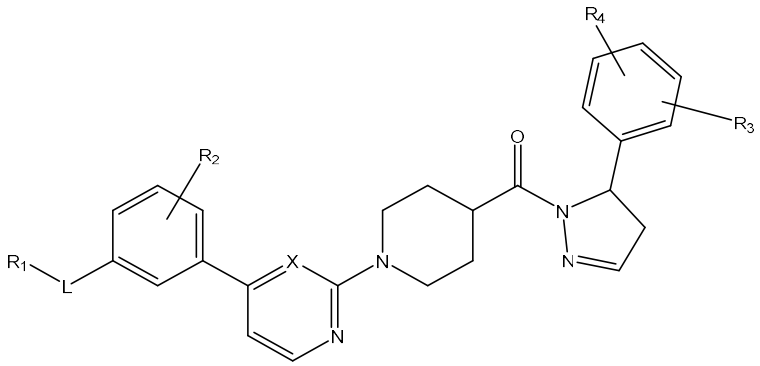
CLAIMS

1. A compound represented by formula (I), or a stereoisomer, pharmaceutically acceptable salt, or deuterated derivative thereof,



Formula (I)

in Formula (I), X is CH or N;

L is O, S, NH, carbonyl, sulfonyl or sulfinyl;

R_1 is C_1-C_{10} alkyl, C_3-C_8 cycloalkyl, 4- to 8-membered heteroalicyclyl, or C_1-C_{10} alkyl substituted with 1 to 3 substituents selected from hydroxyl, C_1-C_6 alkoxy, cyano, -NR^aR^b, C_3-C_8 cycloalkyloxy, -CONH-R_5, C_3-C_8 cycloalkyl, hydroxyl- and/or C_1-C_4 alkyl-substituted C_3-C_8 cycloalkyl, carboxyl, halogen, C_1-C_6 haloalkoxy, -SO_2-R_5, -SO-R_5, -CO-R_5, C_2-C_6 alkynyl, C_2-C_6 alkenyl, C_1-C_4 alkoxyC_1-C_6 alkoxy, 4- to 8-membered heteroalicyclyl, oxo-substituted 4- to 8-membered heteroalicyclyl, hydroxyl- and/or C_1-C_4 alkyl-substituted 4- to 8-membered heteroalicyclyl and C_1-C_6 alkylthio,

the 4- to 8-membered heteroalicyclyl is 4- to 8-membered heteroalicyclyl containing 1-2 atoms selected from N, O, and S as a ring atom,

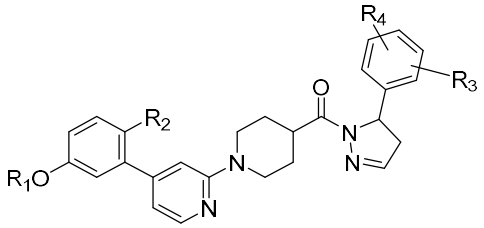
R_5 is hydrogen, hydroxyl, C_1-C_6 alkyl, C_1-C_6 alkoxyC_1-C_6 alkyl, hydroxyl-substituted C_1-C_6 alkyl, C_3-C_8 cycloalkyl or 4- to 8-membered heteroalicyclyl-substituted C_1-C_6 alkyl,

R^a and R^b are each independently hydrogen, C_1-C_6 alkyl, C_3-C_8 cycloalkyl, C_1-C_6 alkoxy-substituted C_1-C_6 alkyl, hydroxyl-substituted C_1-C_6 alkyl, C_3-C_8 cycloalkylC_1-C_6 alkyl, 4- to 8-membered heteroalicyclyl-substituted C_1-C_6 alkyl, C_1-C_3 alkylthio-substituted C_1-C_6 alkyl, mono- or di-C_1-C_3 alkyl-substituted or unsubstituted amino-substituted C_1-C_6 alkyl;

R_2 is hydrogen, C_1-C_3 alkyl, C_1-C_3 alkoxy or halogen;

R_3 and R_4 are each independently hydrogen, halogen or methyl.

2. The compound according to claim 1, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein the compound has a structure of the following formula (II):



Formula (II),

in Formula (II),

R_1 is C_1-C_{10} alkyl, C_3-C_8 cycloalkyl, 4- to 8-membered heteroalicyclyl, or C_1-C_{10} alkyl substituted with 1 to 3 substituents selected from hydroxyl, C_1-C_6 alkoxy, cyano, -NR^aR^b, C_3-C_8 cycloalkyloxy, -CONH-R_5, C_3-C_8 cycloalkyl, hydroxyl- and/or C_1-C_4 alkyl-substituted C_3-C_8 cycloalkyl, carboxyl, halogen, C_1-C_6 haloalkoxy, -SO_2-R_5, -SO-R_5, -CO-R_5, C_2-C_6 alkynyl, C_2-C_6 alkenyl, C_1-C_4 alkoxyC_1-C_6 alkoxy, 4- to 8-membered heteroalicyclyl, oxo-substituted 4- to 8-membered heteroalicyclyl, hydroxyl- and/or C_1-C_4 alkyl-substituted 4- to 8-membered heteroalicyclyl, and C_1-C_6 alkylthio,

the 4- to 8-membered heteroalicyclyl is 4- to 8-membered heteroalicyclyl containing 1-2 atoms selected from N, O, and S as a ring atom,

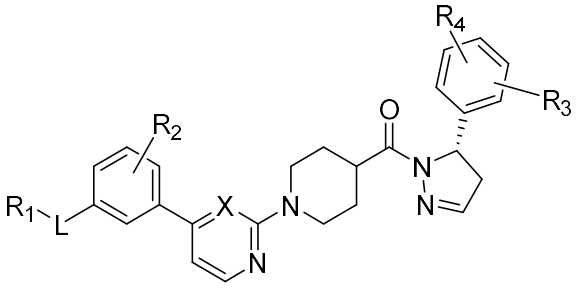
R_5 is hydrogen, hydroxyl, C_1-C_6 alkyl, C_1-C_6 alkoxyC_1-C_6 alkyl, hydroxyl-substituted C_1-C_6 alkyl, C_3-C_8 cycloalkyl or 4- to 8-membered heteroalicyclyl-substituted C_1-C_6 alkyl,

R^a and R^b are each independently hydrogen, C_1-C_6 alkyl, C_3-C_8 cycloalkyl, C_1-C_6 alkoxy-substituted C_1-C_6 alkyl, hydroxyl-substituted C_1-C_6 alkyl, C_3-C_8 cycloalkylC_1-C_6 alkyl, 4- to 8-membered heteroalicyclyl-substituted C_1-C_6 alkyl, C_1-C_3 alkylthio-substituted C_1-C_6 alkyl, or mono- or di-C_1-C_3 alkyl-substituted or unsubstituted amino-substituted C_1-C_6 alkyl;

R_2 is hydrogen, C_1-C_3 alkyl, C_1-C_3 alkoxy or halogen;

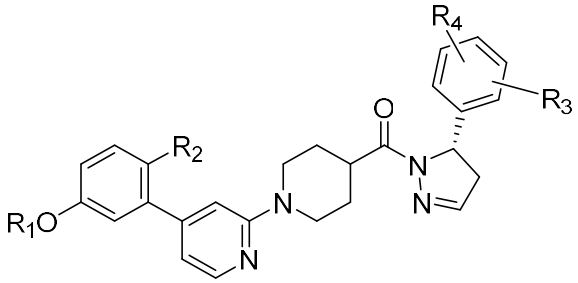
R_3 and R_4 are each independently hydrogen, halogen or methyl.

3. The compound according to claim 1, or a pharmaceutically acceptable salt thereof, wherein the compound has a structure of the following formula (III):



Formula (III).

4. The compound according to claim 2, or a pharmaceutically acceptable salt thereof, wherein the compound has a structure of the following formula (IV):



Formula (IV).

5. The compound according to any one of claims 1 to 4, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein:

R_1 is C_1-C_8 alkyl, C_3-C_6 cycloalkyl, 4- to 6-membered heteroalicyclyl, or C_1-C_8 alkyl substituted with 1 to 3 substituents selected from hydroxyl, C_1-C_3 alkoxy, cyano, C_3-C_6 cycloalkyloxy, C_3-C_6 cycloalkyl, hydroxyl- and/or C_1-C_4 alkyl-substituted C_3-C_6 cycloalkyl, halogen, 4- to 6-membered heteroalicyclyl, oxo-substituted 4- to 6-membered heteroalicyclyl, hydroxyl- and/or C_1-C_4 alkyl-substituted 4- to 6-membered heteroalicyclyl, and C_1-C_3 alkylthio,

the 4- to 6-membered heteroalicyclyl is 4- to 6-membered heteroalicyclyl containing 1-2 atoms selected from N, O, and S as a ring atom.

6. The compound according to claim 5, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein R_1 is methyl, ethyl, propyl, isopropyl, butyl, isobutyl, tert-butyl, pentyl, isopentyl, hexyl, octyl, cyclobutyl, cyclopentyl, cyclohexyl, tetrahydrofuran-2-yl, tetrahydrofuran-3-yl, tetrahydropyran-2-yl, tetrahydropyran-3-yl, tetrahydropyran-4-yl, or C_1-C_8 alkyl substituted with

1 to 3 substituents selected from hydroxyl, methoxy, ethoxy, propoxy, isopropoxy, cyano, cyclobutyloxy, cyclopentyloxy, cyclohexyloxy, cyclobutyl, cyclopentyl, cyclohexyl, 4-hydroxylcyclohexyl, 4-hydroxyl-4-methylcyclohexyl, fluorine, chlorine, tetrahydrofuran-2-yl, tetrahydrofuran-3-yl, tetrahydropyran-2-yl, tetrahydropyran-3-yl, tetrahydropyran-4-yl, pyrrolidin-1-yl, pyrrolidin-2-yl, piperidin-1-yl, piperidin-4-yl, morpholinyl, thiomorpholinyl, 1-methyl-pyrrolidin-2-yl, 1-methyl-piperidin-4-yl, methylthio, ethylthio, propylthio, and isopropylthio;

alternatively, R_1 is methyl, ethyl, propyl, butyl, pentyl, hexyl, hydroxyethyl, hydroxypropyl, hydroxybutyl, hydroxypentyl, hydroxyhexyl, methoxyethyl, methoxypropyl, methoxybutyl, methoxypentyl, methoxyhexyl, tetrahydropyran-4-yl, 4-methyl-4-hydroxypentyl, tetrahydropyran-4-ylethyl, tetrahydropyran-4-ylmethyl, tetrahydropyran-4-ylpropyl, tetrahydropyran-4-ylbutyl, 3-methyl-3-hydroxylbutyl, 2-methyl-2-hydroxylpropyl, 5-methyl-5-hydroxylhexyl, fluoropropyl, fluoroethyl, or 2,2-difluoro-3-hydroxyl-propyl.

7. The compound according to claim 5, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein R_1 is C_1-C_8 alkyl substituted with 1-hydroxycyclopropyl, 1-hydroxycyclobutyl, 1-hydroxycyclopentyl or 1-hydroxycyclohexyl;

alternatively, R_1 is 1-hydroxycyclopropylmethyl or 1-hydroxycyclobutylmethyl;

alternatively, R_1 is hydroxyl- and/or halogen-substituted C_1-C_6 alkyl.

8. The compound according to claim 5, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein R_1 is hydroxyethyl, hydroxypropyl, hydroxybutyl, hydroxypentyl, hydroxyhexyl, 2-methyl-2-hydroxypropyl, 3-methyl-3-hydroxybutyl, 4- methyl-4-hydroxypentyl, 5-methyl-5-hydroxyhexyl, fluoropropyl, fluoroethyl, or 2,2-difluoro-3-hydroxy-propyl.

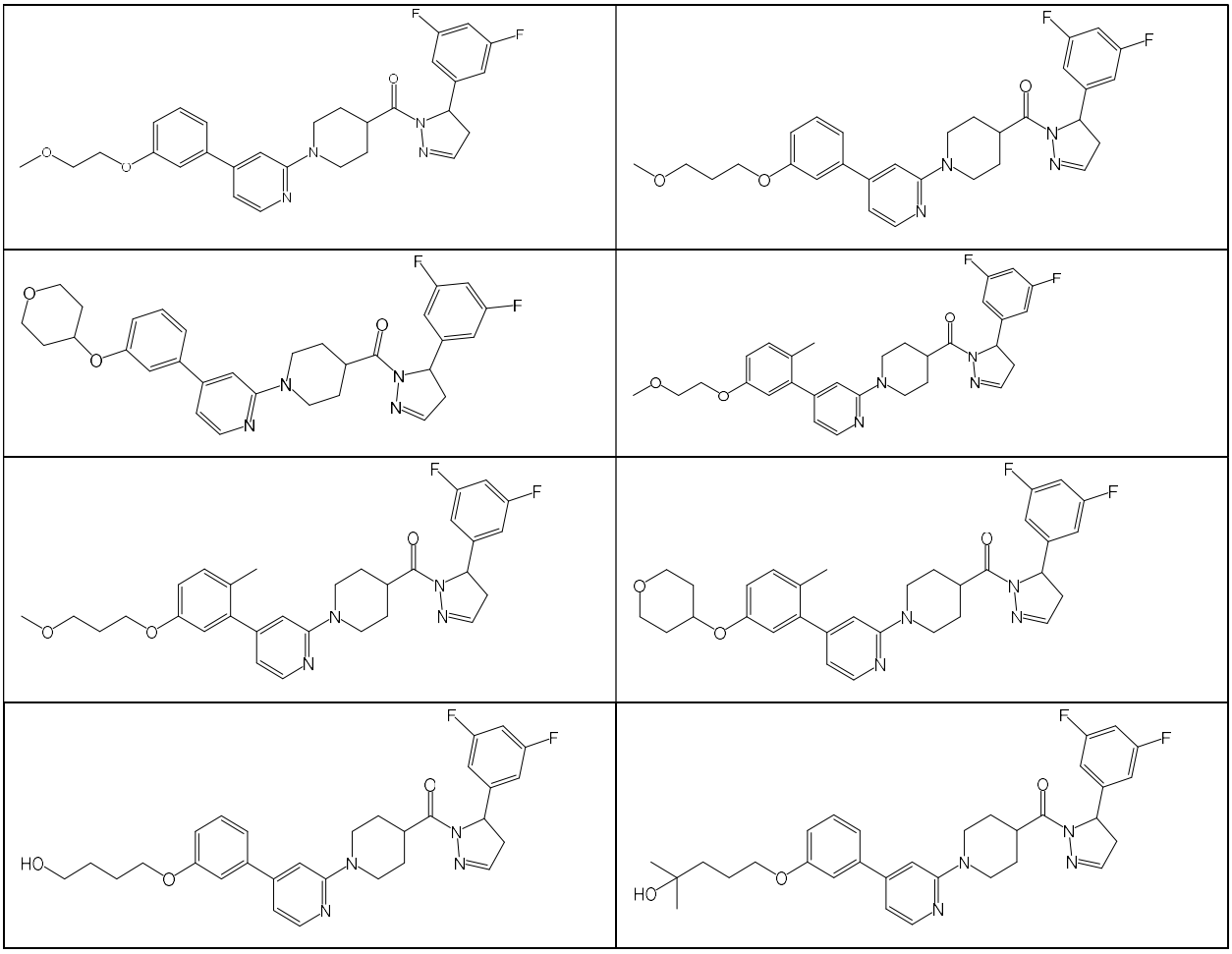
9. The compound according to any one of claims 1 to 8, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein R_2 is hydrogen, methyl, methoxy, fluorine, chlorine, or bromine.

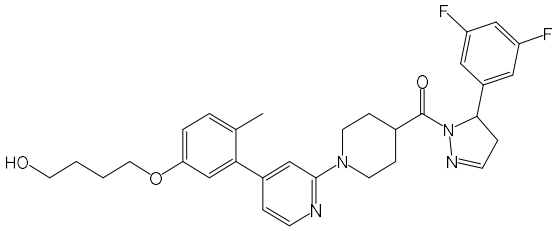
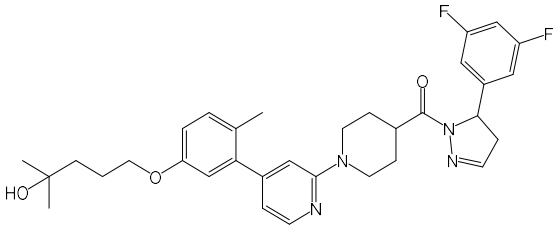
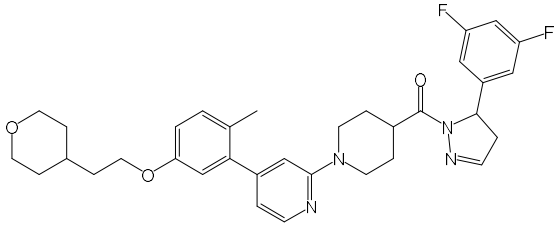
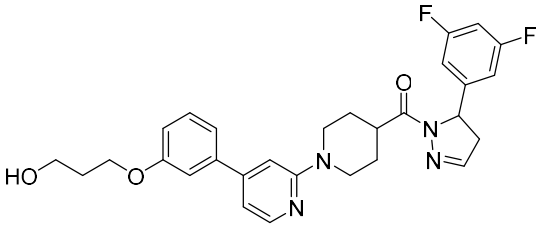
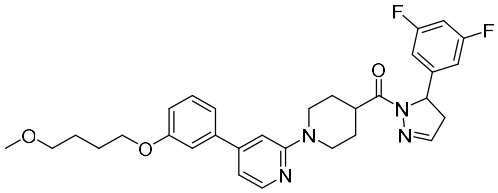
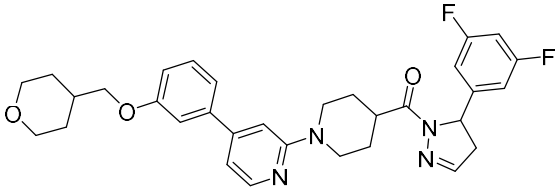
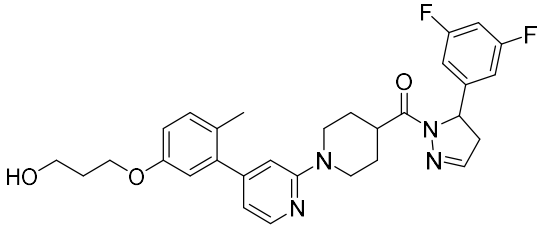
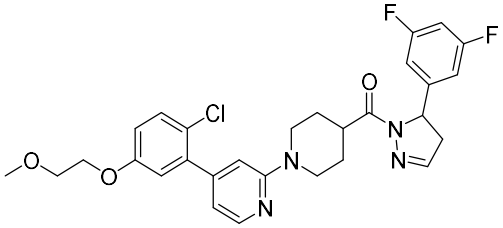
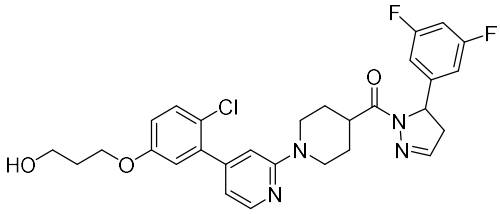
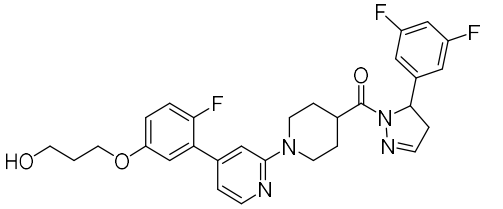
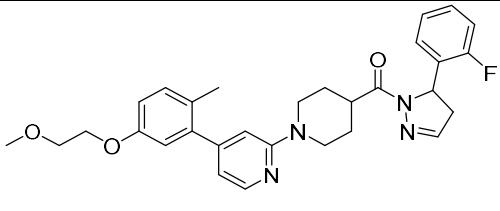
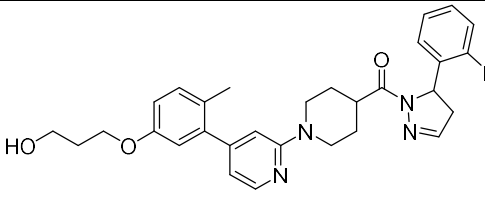
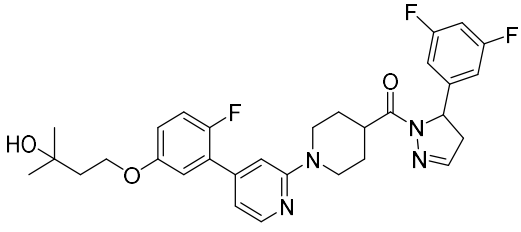
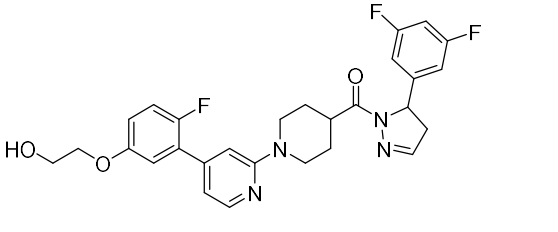
10. The compound according to any one of claims 1 to 8, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein R_2 is fluorine.

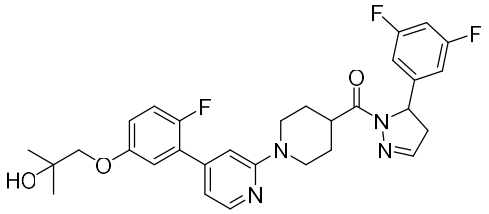
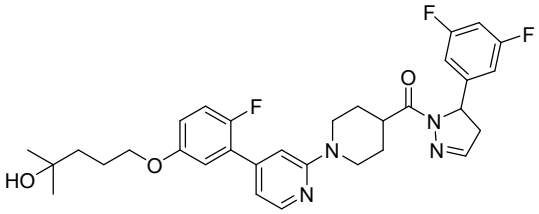
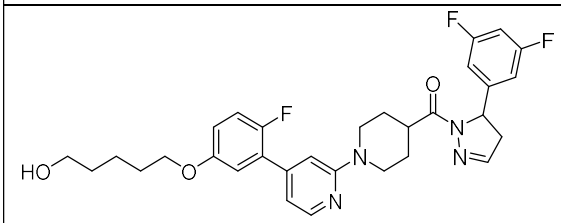
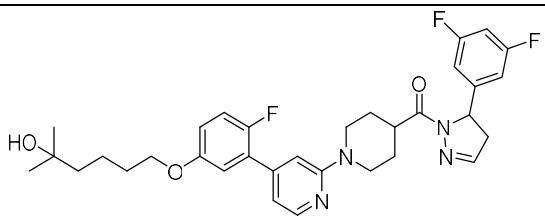
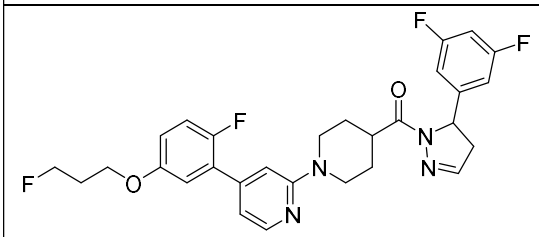
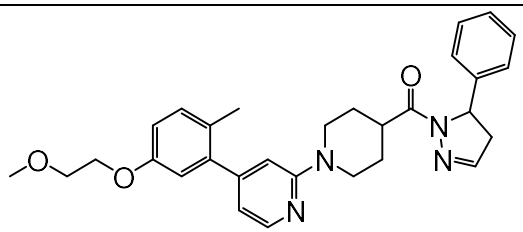
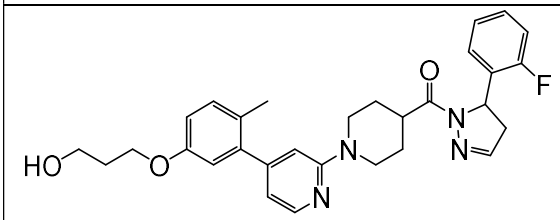
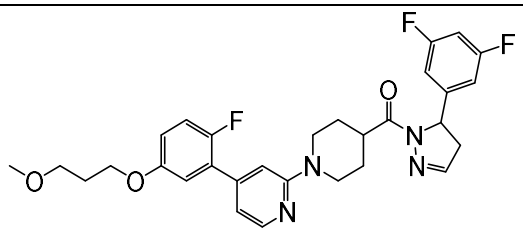
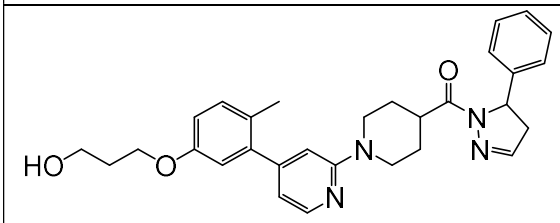
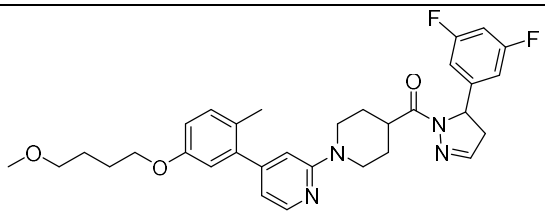
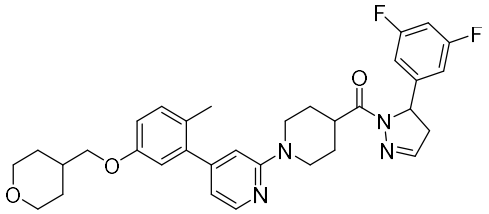
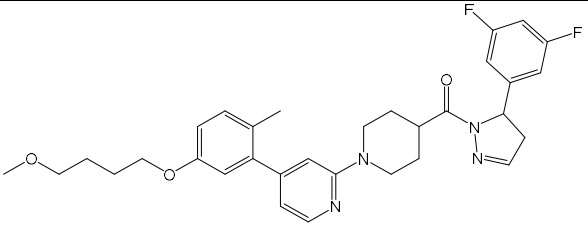
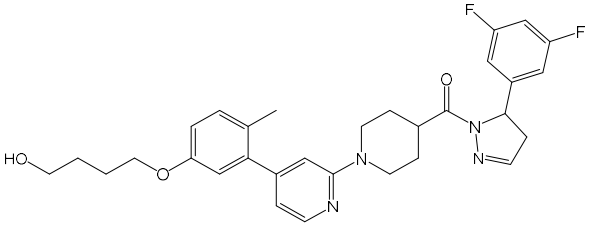
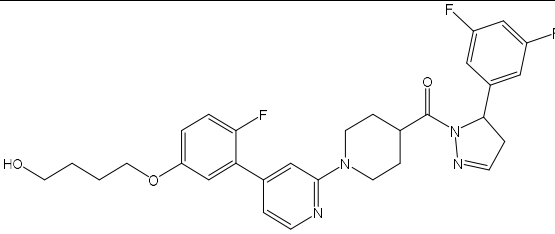
11. The compound according to any one of claims 1 to 10, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein R_3 and R_4 are each independently hydrogen, fluorine, chlorine, or methyl.

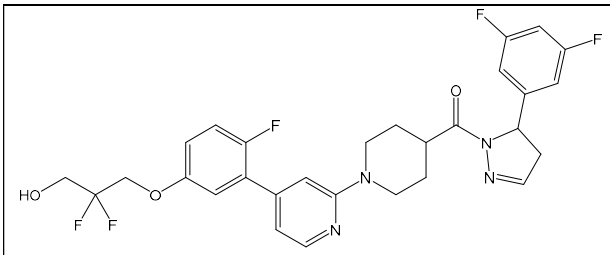
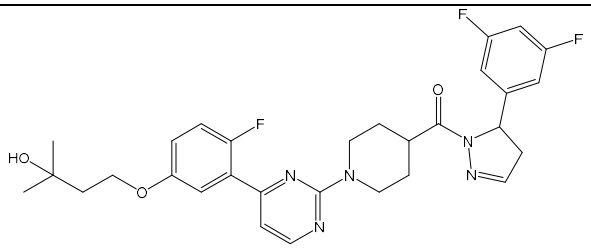
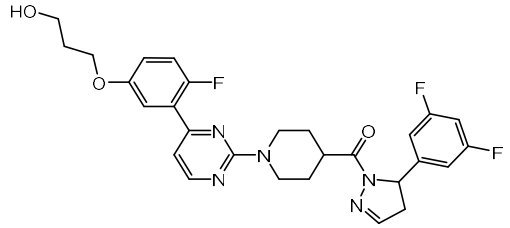
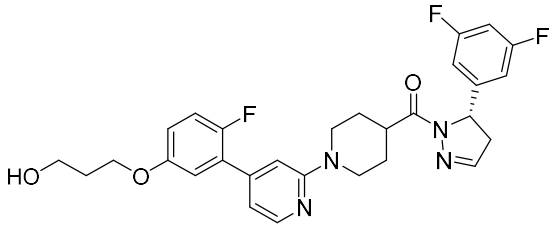
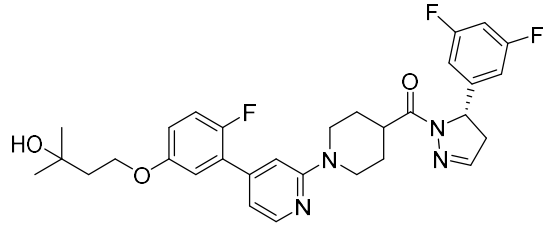
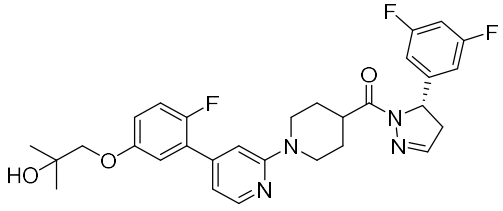
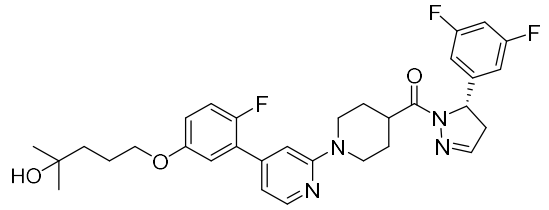
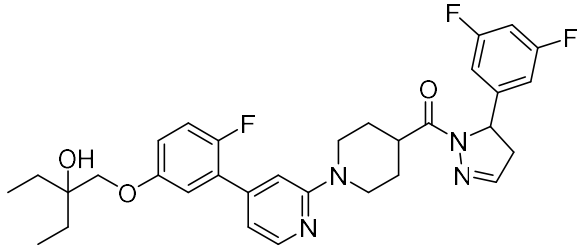
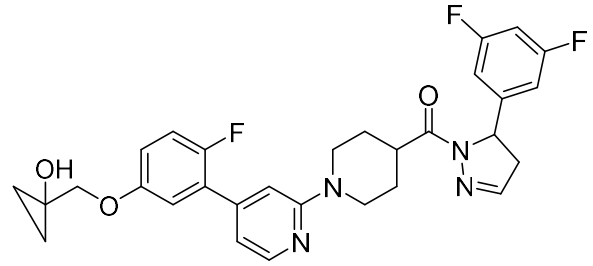
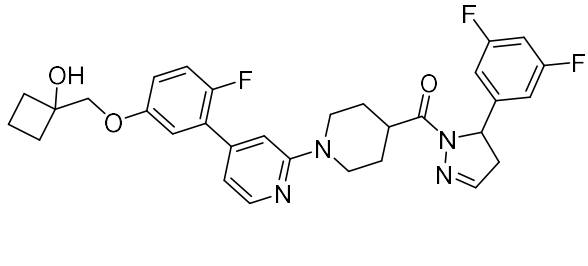
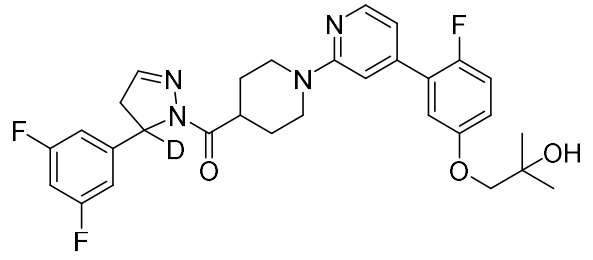
12. The compound according to any one of claims 1 to 10, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein R_3 and R_4 are each independently fluorine.

13. The compound according to claim 1, or a stereoisomer, or pharmaceutically acceptable salt thereof, wherein the compound is selected from the following structures:



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14. A deuterated derivative of the compound according to any one of claims 2 to 13, optionally deuterated at the 5-position of the pyrazolyl in any one of structural formulas (I) to (IV).

15. A pharmaceutical composition comprising the compound according to any one of claims 1 to 14, or a stereoisomer, pharmaceutically acceptable salt or deuterated derivative thereof, and one or more pharmaceutically acceptable carriers or excipients.

16. The pharmaceutical composition according to claim 15, further comprising one or more other therapeutic agents.

17. Use of the compound according to any one of claims 1 to 14, or a stereoisomer, pharmaceutically acceptable salt or deuterated derivative thereof, or the pharmaceutical composition according to claim 15 or 16, in the manufacture of a medicament for treating diseases associated with RIPK1.

18. The use according to claim 17, wherein the diseases associated with RIPK1 include: ocular fundus disease, xerophthalmia, psoriasis, leucoderma, dermatitis, alopecia areata, rheumatoid arthritis, colitis, multiple sclerosis, systemic lupus erythematosus, Crohn's disease, atherosclerosis, pulmonary fibrosis, liver fibrosis, myelofibrosis, non-small cell lung cancer, small cell lung cancer, breast cancer, pancreatic cancer, glioma, glioblastoma, ovarian cancer, cervical cancer, colorectal cancer, melanoma, endometrial cancer, prostate cancer, bladder cancer, leukemia, gastric cancer, liver cancer, gastrointestinal stromal tumor, thyroid cancer, chronic granulocytic leukemia, acute myelocytic leukemia, non-Hodgkin's lymphoma, nasopharyngeal cancer, esophageal cancer, brain tumor, B-cell and T-cell lymphoma, lymphoma, multiple myeloma, biliary tract carcinosarcoma, cholangiocarcinoma, inflammatory bowel disease, ulcerative colitis, retinal detachment, retinitis pigmentosa, macular degeneration, pancreatitis, atopic dermatitis, spondyloarthritis, gout, SoJIA, Sjogren's syndrome, systemic scleroderma, antiphospholipid syndrome, vasculitis, osteoarthritis, non-alcoholic steatohepatitis, alcoholic steatohepatitis, autoimmune hepatitis, autoimmune hepatobiliary disease, primary sclerosing cholangitis, nephritis, celiac disease, autoimmune ITP, transplant rejection, ischemia-reperfusion injury of solid organs, sepsis, systemic inflammatory response syndrome, cerebrovascular accident, myocardial infarction, Huntington's disease,

Alzheimer's disease, Parkinson's disease, allergic diseases, asthma, atopic dermatitis, multiple sclerosis, type I diabetes, Wegener's granulomatosis, pulmonary sarcoidosis, Behçet's disease, interleukin-1 converzyme-related fever syndrome, chronic obstructive pulmonary disease, tumor necrosis factor receptor related periodic syndrome and periodontitis.

19. A compound according to any one of claims 1 to 14, or a stereoisomer, pharmaceutically acceptable salt or deuterated derivative thereof, or a pharmaceutical composition according to claim 15 or 16, for use in treating diseases associated with RIPK1.

20. The compound or the pharmaceutical composition for use according to claim 19, wherein the diseases associated with RIPK1 include: ocular fundus disease, xerophthalmia, psoriasis, leucoderma, dermatitis, alopecia areata, rheumatoid arthritis, colitis, multiple sclerosis, systemic lupus erythematosus, Crohn's disease, atherosclerosis, pulmonary fibrosis, liver fibrosis, myelofibrosis, non-small cell lung cancer, small cell lung cancer, breast cancer, pancreatic cancer, glioma, glioblastoma, ovarian cancer, cervical cancer, colorectal cancer, melanoma, endometrial cancer, prostate cancer, bladder cancer, leukemia, gastric cancer, liver cancer, gastrointestinal stromal tumor, thyroid cancer, chronic granulocytic leukemia, acute myelocytic leukemia, non-Hodgkin's lymphoma, nasopharyngeal cancer, esophageal cancer, brain tumor, B-cell and T-cell lymphoma, lymphoma, multiple myeloma, biliary tract carcinosarcoma, cholangiocarcinoma, inflammatory bowel disease, ulcerative colitis, retinal detachment, retinitis pigmentosa, macular degeneration, pancreatitis, atopic dermatitis, spondyloarthritis, gout, SoJIA, Sjogren's syndrome, systemic scleroderma, antiphospholipid syndrome, vasculitis, osteoarthritis, non-alcoholic steatohepatitis, alcoholic steatohepatitis, autoimmune hepatitis, autoimmune hepatobiliary disease, primary sclerosing cholangitis, nephritis, celiac disease, autoimmune ITP, transplant rejection, ischemia-reperfusion injury of solid organs, sepsis, systemic inflammatory response syndrome, cerebrovascular accident, myocardial infarction, Huntington's disease, Alzheimer's disease, Parkinson's disease, allergic diseases, asthma, atopic dermatitis, multiple sclerosis, type I diabetes, Wegener's granulomatosis, pulmonary sarcoidosis, Behçet's disease, interleukin-1 converzyme-related fever syndrome, chronic obstructive pulmonary disease, tumor necrosis factor receptor related periodic syndrome and periodontitis.