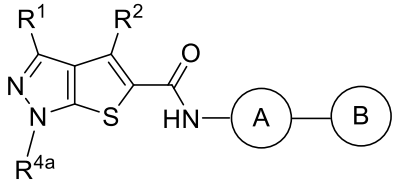
CLAIMS

1. A compound of Structure (I):



(I),

wherein:

ring A is optionally substituted C_3-C_6 cycloalkyl;

ring B is optionally substituted C_4-C_8 cycloalkyl, optionally substituted C_6-C_{10} aryl, or optionally substituted 4-10 membered heterocyclyl;

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

R^2 is hydrogen, optionally substituted C_{1-3} alkyl, or halo;

R^{4a} is optionally substituted phenyl or optionally substituted 5-10 membered heteroaryl; provided that:

when R^{4a} is unsubstituted phenyl, then ring A is C_5-C_6 cycloalkyl and ring B optionally substituted C_4-C_8 cycloalkyl, optionally substituted C_6-C_{10} aryl, or optionally substituted 6-10 membered heterocyclyl,

as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

2. The compound of claim 1, wherein R^1 is methyl

as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

3. The compound of claim 1 or 2, wherein R^2 is hydrogen

as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

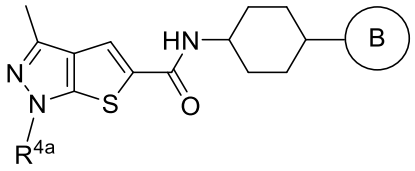
4. The compound of claim 1 or 2, wherein R^2 is unsubstituted C_{1-3} alkyl

as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

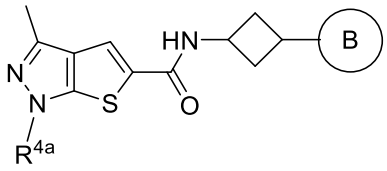
5. The compound of claim 1 or 2, wherein R^2 is chloro, fluoro, or bromo

as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

6. The compound of any one of claims 1-3, wherein the compound has one of the following Structures (IB) or (IC):



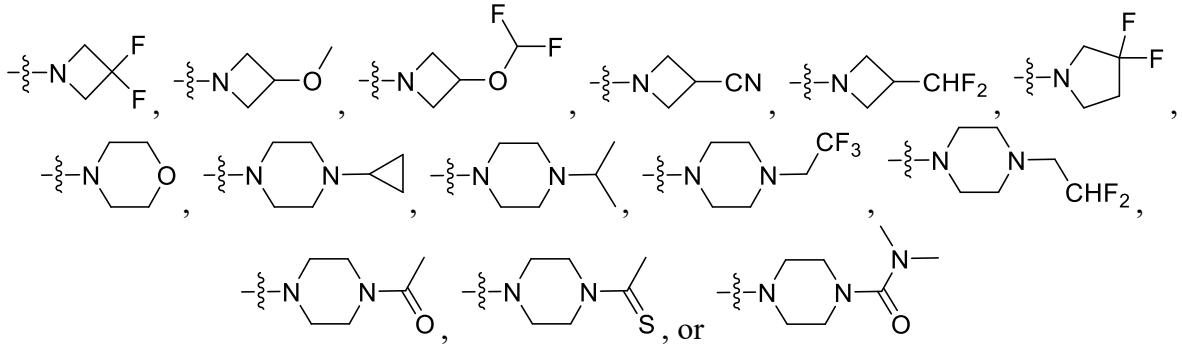
or



(IB) (IC)

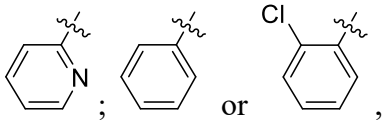
as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

7. The compound of any one of claims 1-6, wherein ring B has one of the following structures:



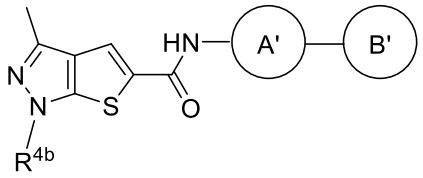
as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

8. The compound of any one of claims 1-7, wherein R^{4a} has one of the following structures:



as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

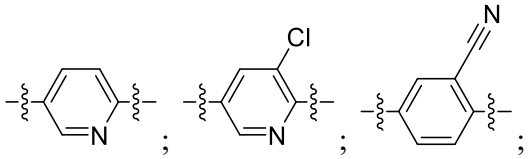
9. A compound of Structure (II):



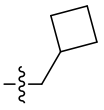
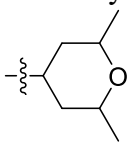
(II)

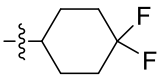
wherein:

ring A' is optionally substituted C_3-C_8 cycloalkyl, or has one of the following structures:



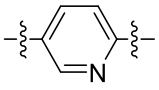
ring B' is optionally substituted 4-10 membered heterocyclyl; and

R^{4b} is $-CH_2CH(CH_3)_2$, $-CH_2C(CH_3)_3$, , 

, or 

;

provided that:

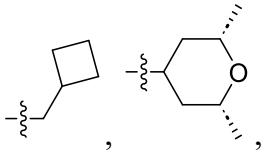
when R^{4b} is $-CH_2CH(CH_3)_2$ and ring A' has the following structure: 

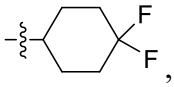
, then ring B' is not piperidinyl or 2,6-dimethyl-4-morpholinyl,

as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

10. The compound of claim 9, wherein R^{4b} is $-CH_2CH(CH_3)_2$ or $-CH_2C(CH_3)_3$, as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

11. The compound of claim 9, wherein R^{4b} has one of the following structures:

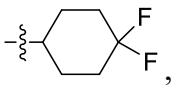


,
, or 

,

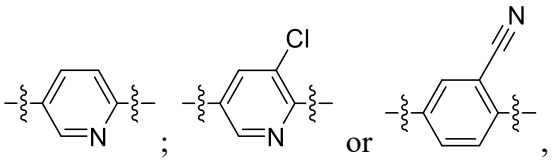
as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

12. The compound of claims 9 or 11, wherein R^{4b} has the following structure:



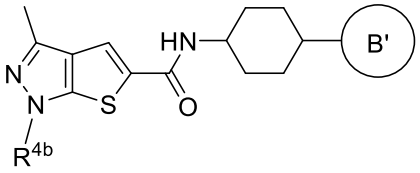
as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

13. The compound of any one of claims 9-12, wherein ring A' has one of the following structures:

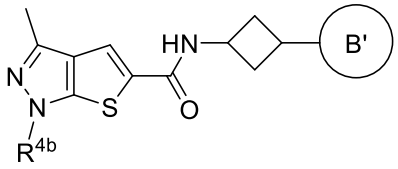


as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

14. The compound of any one of claims 9-12, wherein the compound has one of the following Structures (IIB) or (IIC):



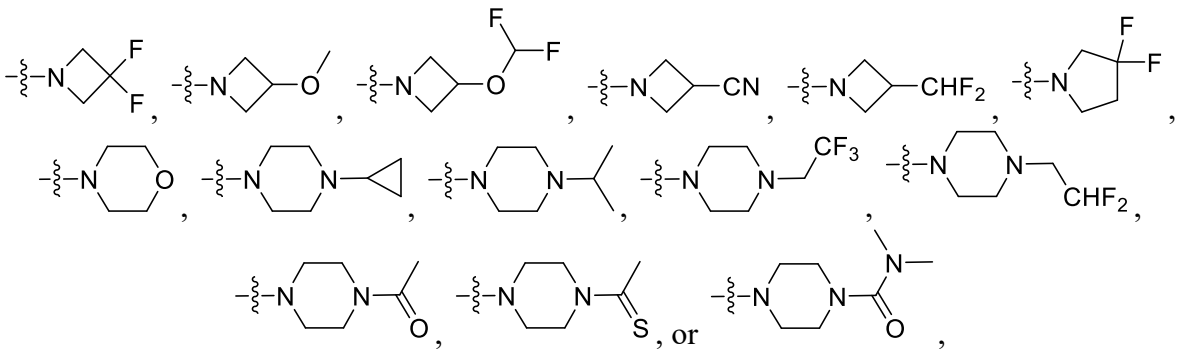
or



(IIB) (IIC)

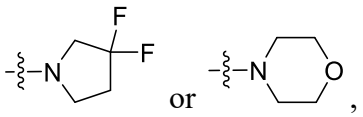
as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

15. The compound of any one of claims 9-14, wherein ring B' has one of the following structures:

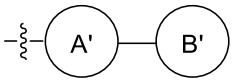


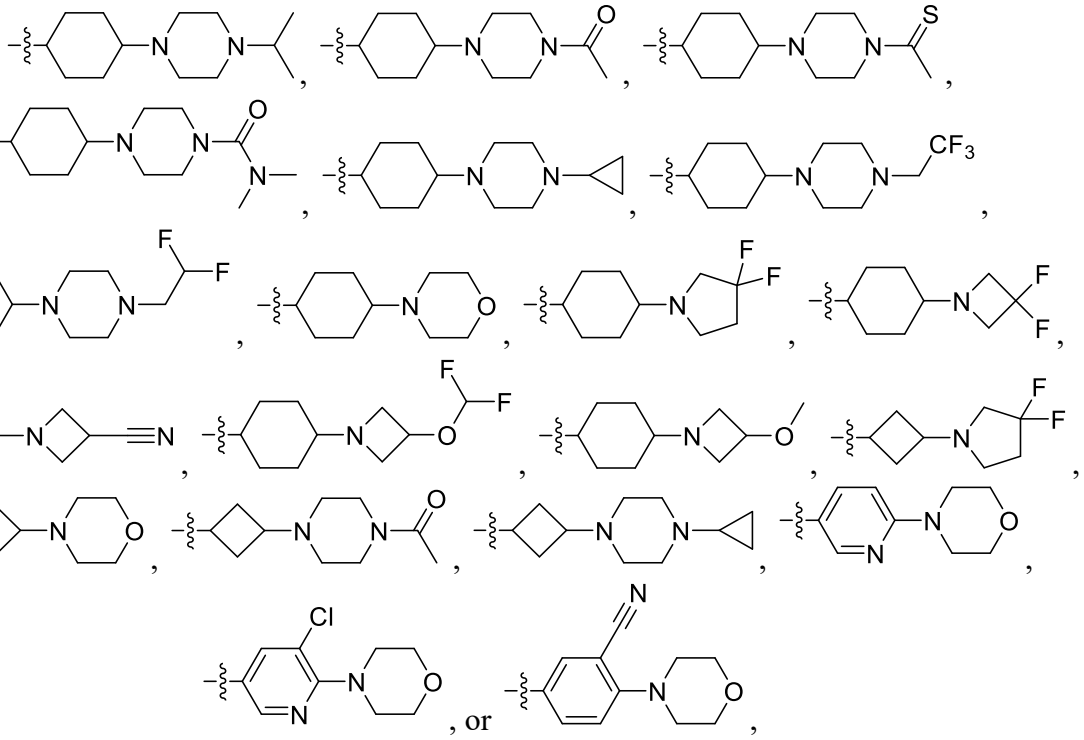
as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

16. The compound of any one of claims 9-15, wherein ring B' has one of the following structures:

 or ,

as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

17. The compound of any one of claims 9-12, wherein  has one of the following structures:



as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

18. The compound of any one of claims 1-17, wherein the compound is selected from:

3-methyl-N-((1*r*,4*r*)-4-morpholinocyclohexyl)-1-(pyridin-2-yl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(2-chlorophenyl)-3-methyl-N-((1*r*,4*r*)-4-morpholinocyclohexyl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(2-chlorophenyl)-3-methyl-N-((1*r*,3*r*)-3-morpholinocyclobutyl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-acetylpiperazin-1-yl)cyclohexyl)-1-(2-chlorophenyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,3*r*)-3-(4-acetylpiperazin-1-yl)cyclobutyl)-1-(2-chlorophenyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(2-chlorophenyl)-N-((1*r*,3*r*)-3-(4-cyclopropylpiperazin-1-yl)cyclobutyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(2-chlorophenyl)-3-methyl-N-(6-morpholinopyridin-3-yl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(2-chlorophenyl)-N-((1*r*,4*r*)-4-(3-(difluoromethoxy)azetidin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-((2*r*,6*s*)-2,6-dimethyltetrahydro-2H-pyran-4-yl)-N-((1*r*,4*r*)-4-(4-isopropylpiperazin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-acetylpiperazin-1-yl)cyclohexyl)-1-((2*r*,6*s*)-2,6-dimethyltetrahydro-2H-pyran-4-yl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-N-(3-(3,3-difluoropyrrolidin-1-yl)cyclobutyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3,3-difluoroazetidin-1-yl)cyclohexyl)-1-isobutyl-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-isobutyl-N-((1*r*,4*r*)-4-(4-isopropylpiperazin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-cyclopropylpiperazin-1-yl)cyclohexyl)-1-isobutyl-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-isobutyl-3-methyl-N-((1*r*,4*r*)-4-(4-(2,2,2-trifluoroethyl)piperazin-1-yl)cyclohexyl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-(2,2-difluoroethyl)piperazin-1-yl)cyclohexyl)-1-isobutyl-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-acetylpiperazin-1-yl)cyclohexyl)-1-(4,4-difluorocyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-N-((1*r*,4*r*)-4-(4-isopropylpiperazin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-N-((1*r*,4*r*)-4-(4-(2,2-difluoroethyl)piperazin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-N-((1*r*,4*r*)-4-(4-(2,2-trifluoroethyl)piperazin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-3-methyl-N-((1*r*,4*r*)-4-morpholinocyclohexyl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-3-methyl-N-((1*r*,4*r*)-4-morpholinocyclohexyl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-cyclopropylpiperazin-1-yl)cyclohexyl)-1-(4,4-difluorocyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-acetylpiperazin-1-yl)cyclohexyl)-1-isobutyl-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3,3-difluoroazetidin-1-yl)cyclohexyl)-1-(4,4-difluorocyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-3-methyl-N-((1*r*,3*r*)-3-morpholinocyclobutyl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-(dimethylcarbamoyl)piperazin-1-yl)cyclohexyl)-1-isobutyl-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(cyclobutylmethyl)-N-((1*r*,4*r*)-4-(4-cyclopropylpiperazin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(cyclobutylmethyl)-3-methyl-N-((1*r*,4*r*)-4-(4-(2,2,2-trifluoroethyl)piperazin-1-yl)cyclohexyl)-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(cyclobutylmethyl)-N-((1*r*,4*r*)-4-(3,3-difluoroazetidin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-ethanethioylpiperazin-1-yl)cyclohexyl)-1-isobutyl-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-cyclopropylpiperazin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

3-methyl-N-((1*r*,3*r*)-3-morpholinocyclobutyl)-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-N-((1*r*,4*r*)-4-(3,3-difluoropyrrolidin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3,3-difluoropyrrolidin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-(2,2-difluoroethyl)piperazin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,3*r*)-3-(4-acetylpiperazin-1-yl)cyclobutyl)-1-(4,4-difluorocyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3,3-difluoroazetidin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-isopropylpiperazin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

3-methyl-N-((1*r*,4*r*)-4-morpholinocyclohexyl)-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,3*r*)-3-(4-cyclopropylpiperazin-1-yl)cyclobutyl)-1-(4,4-difluorocyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,3*r*)-3-(4-cyclopropylpiperazin-1-yl)cyclobutyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

3-methyl-N-(6-morpholinopyridin-3-yl)-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3-cyanoazetidin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(4-acetylpiperazin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-(5-chloro-6-morpholinopyridin-3-yl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-N-((1S,3S)-3-(3,3-difluoropyrrolidin-1-yl)cyclobutyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-(3-cyano-4-morpholinophenyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

1-(4,4-difluorocyclohexyl)-N-((1*r*,4*r*)-4-(3-(difluoromethoxy)azetidin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3-(difluoromethoxy)azetidin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3-cyanoazetidin-1-yl)cyclohexyl)-1-isobutyl-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3-(difluoromethoxy)azetidin-1-yl)cyclohexyl)-1-isobutyl-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide;

N-((1*r*,4*r*)-4-(3-methoxyazetidin-1-yl)cyclohexyl)-3-methyl-1-neopentyl-1H-thieno[2,3-c]pyrazole-5-carboxamide; and

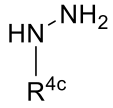
1-isobutyl-N-((1*r*,4*r*)-4-(3-methoxyazetidin-1-yl)cyclohexyl)-3-methyl-1H-thieno[2,3-c]pyrazole-5-carboxamide,

as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

19. Use of a compound of any one of claims 1-18 in the manufacture of a medicament for the treatment of an addiction to an addictive agent , wherein the compound is to be administered to a subject in need thereof, as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

20. Use of a compound of any one of claims 1-18 in the manufacture of a medicament for the treatment of a movement disorder, wherein the compound is to be administered to a subject in need thereof, as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt, solvate, or prodrug thereof.

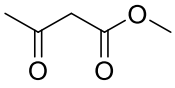
21. A method for preparing a pyrazole compound, the method comprising contacting a hydrazine compound, or a salt thereof, having the following structure:



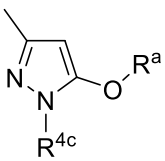
wherein:

R^{4c} is alkyl, aryl, arylalkyl, cycloalkyl, cycloalkylalkyl, heterocyclyl, heterocyclylalkyl, heteroaryl, or heteroarylalkyl;

with an ester compound (or a salt thereof) having the following structure:



thereby forming the pyrazole compound, wherein the pyrazole compound has the following structure:



wherein:

R^a is hydrogen or $-CH_3$, as a stereoisomer, enantiomer, or tautomer thereof or a mixture thereof; or a pharmaceutically acceptable salt or solvate thereof.