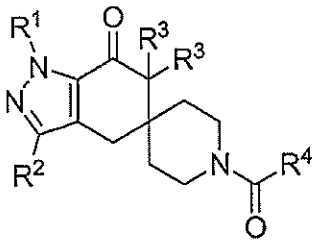
CLAIMS

1. A compound of Formula (I)



wherein

$R^1$ is $(C_1\text{-}C_6)$alkyl, $(C_3\text{-}C_7)$cycloalkyl, tetrahydrofuranyl or oxetanyl; wherein said $(C_1\text{-}C_6)$alkyl is optionally substituted with 1 to 2 substituents independently selected from $(C_1\text{-}C_3)$alkoxy, hydroxy, fluoro, phenyl, tetrahydrofuranyl or oxetanyl;

$R^2$ is hydrogen, halo, $(C_1\text{-}C_3)$alkyl, or cyano;

$R^3$ are each independently hydrogen or $(C_1\text{-}C_3)$alkyl;

$R^4$ is a $(C_6\text{-}C_{10})$aryl, 5 to 12 membered heteroaryl or 8 to 12 membered fused heterocyclicaryl; wherein said $(C_6\text{-}C_{10})$aryl, 5 to 12 membered heteroaryl or 8 to 12 membered fused heterocyclicaryl are each optionally substituted with one to three substituents independently selected from $(C_1\text{-}C_3)$alkyl, $(C_1\text{-}C_3)$alkoxy, halo, amino, $(C_1\text{-}C_3)$alkylamino, di$(C_1\text{-}C_3)$alkylamino, hydroxy, cyano, amido, phenyl, 5 to 6 membered heteroaryl or 5 to 6 membered heterocyclyl; or a pharmaceutically acceptable salt thereof.

2. The compound of claim 1 wherein $R^1$ is $(C_1\text{-}C_6)$alkyl, $(C_3\text{-}C_7)$cycloalkyl, or tetrahydrofuranyl; and $R^2$ is hydrogen or methyl; or a pharmaceutically acceptable salt thereof.

3. The compound of claim 2 wherein $R^1$ is ethyl, isopropyl or t-butyl; each $R^3$ is hydrogen; and $R^4$ is phenyl, pyrazolyl, imidazolyl, triazolyl, pyridinyl, pyrimidinyl, indolyl, benzopyrazinyl, benzoimidazolyl, benzoimidazolonyl, pyrrolopyridinyl, pyrrolopyrimidinyl, pyrazolopyridinyl, pyrazolopyrimidinyl, indazolyl, indolinonyl, naphthyridinyl, quinolinyl, quinolinonyl, dihydroquinolinonyl, oxo-dihydroquinolinonyl,

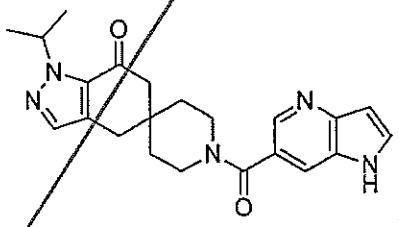
isoquinolinyl, isoquinolinonyl, dihydroisoquinonyl or oxo-dihydroisoquinonyl, each optionally substituted with one to three substituents independently selected from fluoro, chloro, methyl, methoxy, amino, methylamino, dimethylamino, amido, cyano, phenyl, imidazolyl, pyrazolyl, triazolyl, pyridinyl or morpholinyl; or a pharmaceutically acceptable salt thereof.

4. The compound of claim 3 wherein $R^1$ is isopropyl or t-butyl; $R^2$ is hydrogen; or a pharmaceutically acceptable salt thereof.

5. The compound of claim 4 wherein $R^4$ is indazolyl, benzoimidazolyl, 1-oxo-1,2-dihydroisoquinolinyl, 1*H*-pyrrolo[3,2-*b*]pyridinyl, 2-oxo-2,3-dihydro-1*H*-benzo[*d*]imidazolyl, 1*H*-pyrazolylphenyl, 1*H*-pyrazolylpyridinyl, or 1*H*-imidazolylphenyl; each optionally substituted with one to two methyl, chloro or fluoro; or a pharmaceutically acceptable salt thereof.

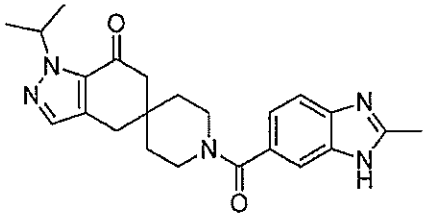
6. 1-isopropyl-1'-(1*H*-pyrrolo[3,2-*b*]pyridine-6-carbonyl)-4,6-dihydrospiro[indazole-5,4'-piperidin]-7(1*H*)-one or a pharmaceutically acceptable salt thereof.

7. A compound of formula

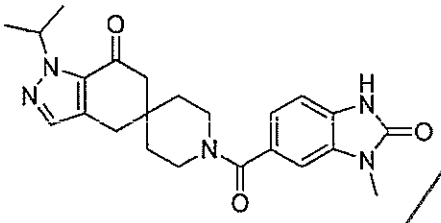


8. 1-isopropyl-1'-(2-methyl-1*H*-benzo[*d*]imidazole-6-carbonyl)-4,6-dihydrospiro[indazole-5,4'-piperidin]-7(1*H*)-one or a pharmaceutically acceptable salt thereof.

9. A compound of formula



10. A compound of formula



or a pharmaceutically acceptable salt thereof.

11. A pharmaceutical composition comprising a therapeutically effective amount of a compound of any of claims 1 through 10, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable excipient, diluent, or carrier.

12. The composition of claim 11 further comprising at least one additional anti-diabetic agent.

13. The composition of claim 12 wherein said anti-diabetic agent is selected from the group consisting of metformin, acetohexamide, chlorpropamide, diabinese, glibenclamide, glipizide, glyburide, glimepiride, gliclazide, glipentide, gliquidone, glisolamide, tolazamide, tolbutamide, tendamistat, trestatin, acarbose, adiposine, camiglibose, emiglitate, miglitol, voglibose, pradimicin-Q, salbostatin, balaglitazone, ciglitazone, darglitazone, englitazone, isaglitazone, pioglitazone, rosiglitazone, troglitazone, exendin-3, exendin-4, trodusquemine, reservatrol, hyrtiosal extract, sitagliptin, vildagliptin, alogliptin and saxagliptin.

14. Use of the compound of any one of claims 1 to 10 in the manufacture of a medicament for treating or delaying the progression or onset of Type 2 diabetes.

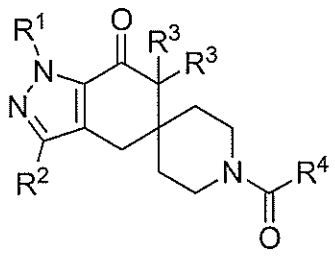
15. Use of the compound of any one of claims 1 to 10 in the manufacture of a medicament for treating nonalcoholic fatty liver disease (NAFLD) or hepatic insulin resistance.

16. Use of the pharmaceutical composition of any one of claims 11 to 13 in the manufacture of a medicament for treating or delaying the progression or onset of Type 2 diabetes.

17. Use of the pharmaceutical composition of any one of claims 11 to 13 in the manufacture of a medicament for treating nonalcoholic fatty liver disease (NAFLD) or hepatic insulin resistance.

CLAIMS

1. A compound of Formula (I)



wherein

$R^1$ is $(C_1\text{-}C_6)$alkyl, $(C_3\text{-}C_7)$cycloalkyl, tetrahydrofuranyl or oxetanyl; wherein said $(C_1\text{-}C_6)$alkyl is optionally substituted with 1 to 2 substituents independently selected from $(C_1\text{-}C_3)$alkoxy, hydroxy, fluoro, phenyl, tetrahydrofuranyl or oxetanyl;

$R^2$ is hydrogen, halo, $(C_1\text{-}C_3)$alkyl, or cyano;

$R^3$ are each independently hydrogen or $(C_1\text{-}C_3)$alkyl;

$R^4$ is a $(C_6\text{-}C_{10})$aryl, 5 to 12 membered heteroaryl or 8 to 12 membered fused heterocyclicaryl; wherein said $(C_6\text{-}C_{10})$aryl, 5 to 12 membered heteroaryl or 8 to 12 membered fused heterocyclicaryl are each optionally substituted with one to three substituents independently selected from $(C_1\text{-}C_3)$alkyl, $(C_1\text{-}C_3)$alkoxy, halo, amino, $(C_1\text{-}C_3)$alkylamino, di$(C_1\text{-}C_3)$alkylamino, hydroxy, cyano, amido, phenyl, 5 to 6 membered heteroaryl or 5 to 6 membered heterocyclyl; or a pharmaceutically acceptable salt thereof.

2. The compound of claim 1 wherein $R^1$ is $(C_1\text{-}C_6)$alkyl, $(C_3\text{-}C_7)$cycloalkyl, or tetrahydrofuranyl; and $R^2$ is hydrogen or methyl; or a pharmaceutically acceptable salt thereof.

3. The compound of claim 2 wherein $R^1$ is ethyl, isopropyl or t-butyl; each $R^3$ is hydrogen; and $R^4$ is phenyl, pyrazolyl, imidazolyl, triazolyl, pyridinyl, pyrimidinyl, indolyl, benzopyrazinyl, benzoimidazolyl, benzoimidazolonyl, pyrrolopyridinyl, pyrrolopyrimidinyl, pyrazolopyridinyl, pyrazolopyrimidinyl, indazolyl, indolinonyl, naphthyridinyl, quinolinyl, quinolinonyl, dihydroquinolinonyl, oxo-dihydroquinolinonyl,

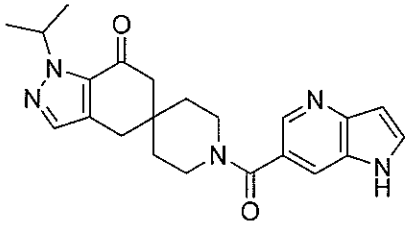
isoquinolinyl, isoquinolinonyl, dihydroisoquinonyl or oxo-dihydroisoquinonyl, each optionally substituted with one to three substituents independently selected from fluoro, chloro, methyl, methoxy, amino, methylamino, dimethylamino, amido, cyano, phenyl, imidazolyl, pyrazolyl, triazolyl, pyridinyl or morpholinyl; or a pharmaceutically acceptable salt thereof.

4. The compound of claim 3 wherein $R^1$ is isopropyl or t-butyl; $R^2$ is hydrogen; or a pharmaceutically acceptable salt thereof.

5. The compound of claim 4 wherein $R^4$ is indazolyl, benzoimidazolyl, 1-oxo-1,2-dihydroisoquinolinyl, 1*H*-pyrrolo[3,2-*b*]pyridinyl, 2-oxo-2,3-dihydro-1*H*-benzo[*d*]imidazolyl, 1*H*-pyrazolylphenyl, 1*H*-pyrazolylpyridinyl, or 1*H*-imidazolylphenyl; each optionally substituted with one to two methyl, chloro or fluoro; or a pharmaceutically acceptable salt thereof.

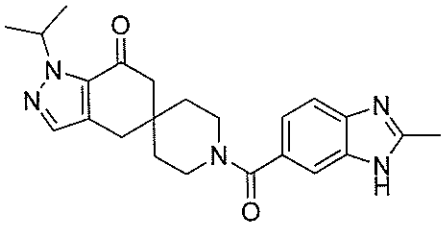
6. The compound of claim 1 that is 1-isopropyl-1'-(1*H*-pyrrolo[3,2-*b*]pyridine-6-carbonyl)-4,6-dihydrospiro[indazole-5,4'-piperidin]-7(1*H*)-one or a pharmaceutically acceptable salt thereof.

7. The compound of claim 1 of formula

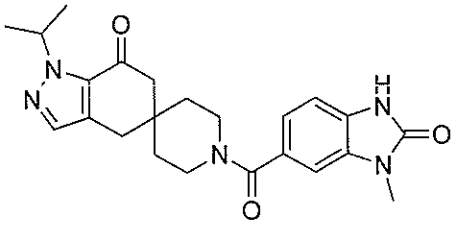


8. The compound of claim 1 that is 1-isopropyl-1'-(2-methyl-1*H*-benzo[*d*]imidazole-6-carbonyl)-4,6-dihydrospiro[indazole-5,4'-piperidin]-7(1*H*)-one or a pharmaceutically acceptable salt thereof.

9. The compound of claim 1 of formula



10. The compound of claim 1 of formula



or a pharmaceutically acceptable salt thereof.

11. A pharmaceutical composition comprising a therapeutically effective amount of a compound of any of claims 1 through 10, or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable excipient, diluent, or carrier.

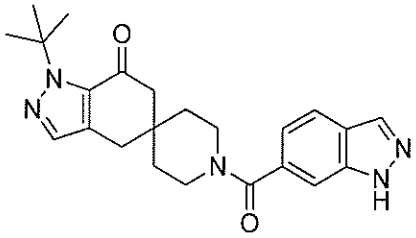
12. Use of the compound of any one of claims 1 to 10 in the manufacture of a medicament for treating or delaying the progression or onset of Type 2 diabetes.

13. Use of the compound of any one of claims 1 to 10 in the manufacture of a medicament for treating nonalcoholic fatty liver disease (NAFLD) or hepatic insulin resistance.

14. Use of the pharmaceutical composition of claim 11 in the manufacture of a medicament for treating or delaying the progression or onset of Type 2 diabetes.

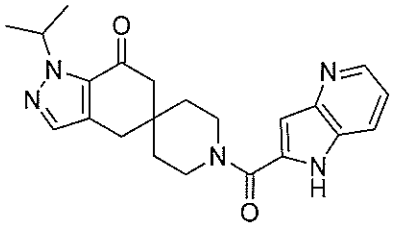
15. Use of the pharmaceutical composition of claim 11 in the manufacture of a medicament for treating nonalcoholic fatty liver disease (NAFLD) or hepatic insulin resistance.

16. The compound of claim 1 of structure



or a pharmaceutically acceptable salt thereof.

17. The compound of claim 1 of structure



or a pharmaceutically acceptable salt thereof.