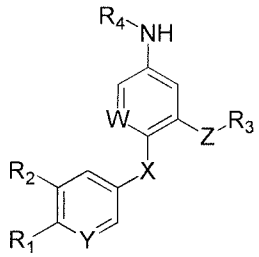
# CLAIMS

1. A compound of Formula (I), or pharmaceutically acceptable salts thereof, solvates thereof, chelates thereof, non-covalent complexes thereof, or prodrugs of the compounds mentioned above, or the mixture of any form above mentioned,




Formula (I)

wherein:

W and Y are independently selected from N or C;

X is selected from O or S;

Z is selected from C, N, O or S;

$R_1$ is selected from the group consisting of -H, alkanyl, substituted alkanyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, alkoxy, substituted alkoxy, $C(=O)R_5$, $SR_5$, $SO_2R_5$ or haloalkyl; $R_5$ is selected from the group consisting of lower alkanyl, substituted lower alkanyl, alkoxy, substituted alkoxy or $NR_6R_7$; $R_6$ and $R_7$ are independently selected from the group consisting of -H, lower alkanyl, substituted lower alkanyl, or $R_6$ and $R_7$ can join together to form a 3 to 6 membered ring or a substituted 3 to 6 membered ring;

$R_2$ is selected from the group consisting of -H, alkanyl, substituted alkanyl, halogen or haloalkyl;

$R_3$ is selected from the group consisting of substituted alkanyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, heterocycloalkyl or substituted heterocycloalkyl;

$R_4$ is selected from the group consisting of heteroaryl or substituted heteroaryl, wherein at least one ortho atom of the heteroaryl connected with NH in Formula (I) is N.

2. A compound of Claim 1, wherein W is C.

3. A compound of Claim 2, wherein Y is C, X is O and Z is C.

4. A compound of Claim 2, wherein Y is N.

5. A compound of Claim 4, wherein X is O.

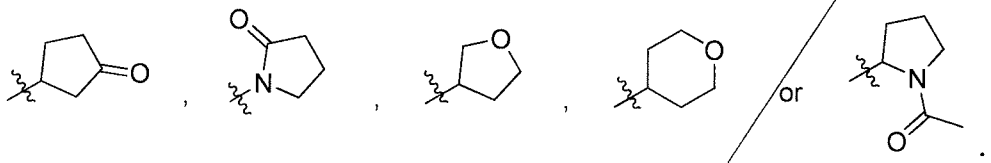
6. A compound of Claim 5, wherein Z is C.

7. A compound of Claim 1, wherein W is N, Y is C, X is O and Z is C.

8. A compound according to any one of Claims 1-7, wherein $R_1$ is selected from -H, lower alkanyl, substituted lower alkanyl, lower alkenyl, substituted lower alkenyl, lower alkynyl, substituted lower alkynyl, $C_{1-6}$alkoxy or substituted $C_{1-6}$alkoxy.

9. A compound of Claim 8, wherein $R_2$ is -H; $R_3$ is selected from the group consisting of cycloalkyl, substituted cycloalkyl, heterocycloalkyl or substituted heterocycloalkyl; $R_4$ is selected from 5 or 6 membered heteroaryl.

10. A compound of Claim 9, wherein $R_3$ is selected from

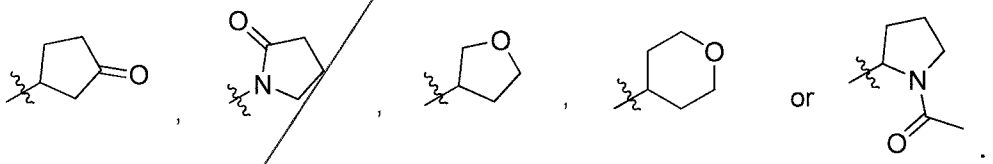


11. A compound of Claim 10, wherein $R_4$ is selected from substituted 5 or 6 membered heteroaryl, where one substitution is $C_{1-3}$ carboxylate.

12. A compound according to any one of Claims 1-7, wherein $R_1$ is selected from $C(=O)R_5$, $SR_5$, $SO_2R_5$ or haloalkyl; $R_5$ is selected from $C_{1-3}$alkanyl, substituted $C_{1-3}$alkanyl, $NR_6R_7$, $C_{1-6}$alkoxy, or substituted $C_{1-6}$alkoxy.

13. A compound of Claim 12, wherein $R_2$ is -H; $R_3$ is selected from cycloalkanyl, substituted cycloalkanyl, heterocycloalkyl or substituted heterocycloalkyl; $R_4$ is selected from substituted 5- or 6-membered heteroaryl.

14. A compound of Claim 13, wherein $R_3$ is selected from



15. A compound of Claim 13, wherein $R_1$ is $C(=O)R_5$; $R_5$ is $NR_6R_7$.

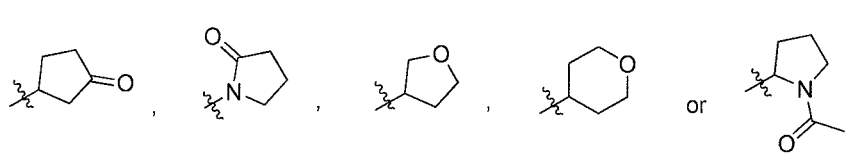
16. A compound of Claim 13, wherein $R_1$ is $SO_2R_5$; $R_5$ is selected from $C_{1-3}$alkanyl.

17. A compound of Claim 15 or 16, wherein $R_4$ is selected from substituted 5 or 6 membered heteroaryl, where one substitution is $C_{1-3}$ carboxylate.

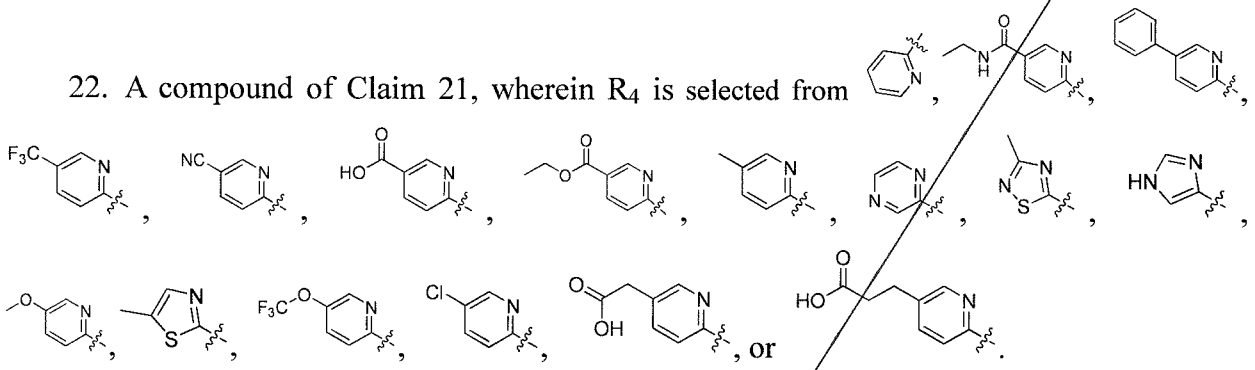
18. A compound of Claim 12, wherein $R_6$ and $R_7$ are independently selected from -H, $C_{1-4}$alkanyl or substituted $C_{1-4}$alkanyl.

19. A compound of Claim 12, wherein $R_6$ and $R_7$ can join together to form a 3 to 6 membered ring or a substituted 3 to 6 membered ring containing heteroatoms selected from O or S.

20. A compound according to any one of Claims 1-7, wherein $R_3$ is selected from

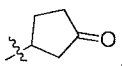
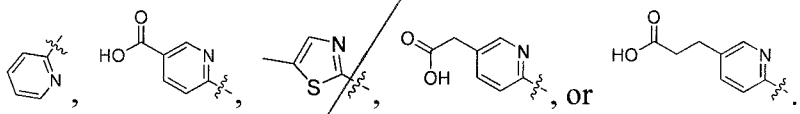


21. A compound of Claims 20, wherein $R_4$ is a 5- or 6-membered heteroaryl or a substituted 5- or 6-membered heteroaryl.

22. A compound of Claim 21, wherein $R_4$ is selected from 

23. A compound of Claim 22, wherein $R_1$ is selected from lower alkanyl, $C_{1-6}$alkoxy, $C(=O)R_5$, or $SO_2R_5$, where $R_5$ is selected from lower alkanyl, or $NR_6R_7$, where $R_6$ and $R_7$ are independently selected from -H, lower alkanyl, or $R_6$ and $R_7$ can join together to form a 3 to 6 membered ring.

24. A compound of Claim 23, wherein $R_2$ is selected from -H, or halogen.

25. A compound of Claim 24, wherein $R_3$ is selected from  or , and $R_4$ is selected from 

26. A compound of Claim 24 or 25, wherein $R_2$ is –H, $R_1$ is selected from $C(=O)NR_6R_7$ or $SO_2R_5$; $R_5$ is selected from $C_{1-3}$alkanyl.

27. A compound of Claim 1, wherein the compound is selected from:

1-(2-(6-(methylsulfonyl)pyridin-3-yloxy)-5-(pyridin-2-ylamino)benzyl)pyrrolidin-2-one;

N-ethyl-6-(4-(6-(methylsulfonyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinamide;

1-(2-(6-(methylsulfonyl)pyridin-3-yloxy)-5-(5-phenylpyridin-2-ylamino)benzyl)pyrrolidin-2-one;

1-(2-(6-(methylsulfonyl)pyridin-3-yloxy)-5-(5-(trifluoromethyl)pyridin-2-ylamino)benzyl)pyrrolidin-2-one;

6-(4-(6-(methylsulfonyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinonitrile;

6-(4-(6-(methylsulfonyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)ni

cotinic acid;

ethyl 6-(4-(6-(methylsulfonyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinate;

1-(5-(5-methylpyridin-2-ylamino)-2-(6-(methylsulfonyl)pyridin-3-yloxy)benzyl)pyrrolidin-2-one;

1-(2-(6-(methylsulfonyl)pyridin-3-yloxy)-5-(pyrazin-2-ylamino)benzyl)pyrrolidin-2-one;

1-(5-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-(6-(methylsulfonyl)pyridin-3-yloxy)benzyl)pyrrolidin-2-one;

1-(5-(1H-imidazol-4-ylamino)-2-(6-(methylsulfonyl)pyridin-3-yloxy)benzyl)pyrrolidin-2-one;

1-(5-(5-methoxypyridin-2-ylamino)-2-(6-(methylsulfonyl)pyridin-3-yloxy)benzyl)pyrrolidin-2-one;

1-(2-(6-(methylsulfonyl)pyridin-3-yloxy)-5-(5-methylthiazol-2-ylamino)benzyl)pyrrolidin-2-one;

1-(2-(6-(methoxymethyl)pyridin-3-yloxy)-5-(pyridin-2-ylamino)benzyl)pyrrolidin-2-one;

N-ethyl-6-(4-(6-(methoxymethyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinamide;

1-(2-(6-(methoxymethyl)pyridin-3-yloxy)-5-(5-phenylpyridin-2-ylamino)benzyl)pyrrolidin-2-one;

1-(2-(6-(methoxymethyl)pyridin-3-yloxy)-5-(5-(trifluoromethyl)pyridin-2-ylamino)benzyl)pyrrolidin-2-one;

6-(4-(6-(methoxymethyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinonitrile;

6-(4-(6-(methoxymethyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinic acid;

ethyl 6-(4-(6-(methoxymethyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinate;

1-(2-(6-(methoxymethyl)pyridin-3-yloxy)-5-(5-methylpyridin-2-ylamino)benzyl)pyrrolidin-2-one;

1-(2-(6-(methoxymethyl)pyridin-3-yloxy)-5-(pyrazin-2-ylamino)benzyl)pyrrolidin-2-one;

1-(2-(6-(methoxymethyl)pyridin-3-yloxy)-5-(3-methyl-1,2,4-thiadiazol-5-ylamino)benzyl)pyrrolidin-2-one;

1-(5-(1H-imidazol-4-ylamino)-2-(6-(methoxymethyl)pyridin-3-yloxy)benzyl)pyrrolidin-2-one;

1-(2-(6-(methoxymethyl)pyridin-3-yloxy)-5-(5-methylthiazol-2-ylamino)benzyl)pyrrolidin-2-one;

1-(2-(6-(morpholinosulfonyl)pyridin-3-yloxy)-5-(5-(trifluoromethyl)pyridin-2-ylamino)benzyl)pyrrolidin-2-one;

N-ethyl-5-(2-((2-oxopyrrolidin-1-yl)methyl)-4-(5-(trifluoromethoxy)pyridin-2-ylamino)phenoxy)picolinamide;

1-(2-(5-chloro-6-methylpyridin-3-yloxy)-5-(5-chloropyridin-2-ylamino)benzyl)pyrrolidin-2-one;

ethyl 6-(4-(4-(methylsulfonyl)phenoxy)-3-((3-oxocyclopentyl)methyl)phenylamino)nicotinate;

3-(2-(4-(methylsulfonyl)phenoxy)-5-(5-methylthiazol-2-ylamino)benzyl)cyclopentanone;

3-(2-(4-(methylsulfonyl)phenoxy)-5-(pyrazin-2-ylamino)benzyl)cyclopentanone;

3-(5-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-(4-(methylsulfonyl)phenoxy)benzyl)cyclopentanone;

3-(5-(1H-imidazol-4-ylamino)-2-(4-(methylsulfonyl)phenoxy)benzyl)cyclopentanone;

3-(2-(4-(methylsulfonyl)phenoxy)-5-(5-(trifluoromethyl)pyridin-2-ylamino)benzyl)cyclopentanone;

N-(6-(4-(methylsulfonyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-yl)pyridin-2-amine;

N-ethyl-6-(6-(4-(methylsulfonyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-ylamino)nicotinamide;

N-(6-(4-(methylsulfonyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-yl)-5-phenylpyridin-2-amine;

N-(6-(4-(methylsulfonyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-yl)-5-(trifluoromethyl)pyridin-2-amine;

6-(6-(4-(methylsulfonyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-ylamino)nicotinonitrile;

6-(6-(4-(methylsulfonyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-ylamino)nicotinic acid;

ethyl 6-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenylamino)nicotinate;

N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenyl)-5-(trifluoromethyl)pyridin-2-amine;

N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenyl)pyrazin-2-amine;

3-methyl-N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenyl)-1,2,4-thiadiazol-5-amine;

N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenyl)-1H-imidazol-4-amine;

5-methyl-N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenyl)thiazol-2-amine;

ethyl
6-(3-((1-acetylpyrrolidin-2-yl)methyl)-4-(4-(methylsulfonyl)phenoxy)phenylamino)nicotinate;

1-(2-(2-(4-(methylsulfonyl)phenoxy)-5-(5-(trifluoromethyl)pyridin-2-ylamino)benzyl)pyrrolidin-1-yl)ethanone;

1-(2-(2-(4-(methylsulfonyl)phenoxy)-5-(pyrazin-2-ylamino)benzyl)pyrrolidin-1-yl)ethanone;

1-(2-(5-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-(4-(methylsulfonyl)phenoxy)benzyl)pyrrolidin-1-yl)ethanone;1-(2-(5-(1H-imidazol-4-ylamino)-2-(4-(methylsulfonyl)phenoxy)benzyl)pyrrolidin-1-yl)ethanone;

1-(2-(2-(4-(methylsulfonyl)phenoxy)-5-(5-methylthiazol-2-ylamino)benzyl)pyrrolidin-1-yl)ethanone;

4-(4-(methylsulfonyl)phenoxy)-N1-(pyridin-2-yl)-N3-(tetrahydro-2H-pyran-4-yl)benzene-1,3-diamine;

4-(4-(methylsulfonyl)phenoxy)-N3-(tetrahydro-2H-pyran-4-yl)-N1-(5-(trifluoromethyl)pyridin-2-yl)benzene-1,3-diamine;

4-(4-(methylsulfonyl)phenoxy)-N1-(pyrimidin-4-yl)-N3-(tetrahydro-2H-pyran-4-yl)benzene-1,3-diamine;

3-methyl-N-(4-(4-(methylsulfonyl)phenylthio)-3-(tetrahydro-2H-pyran-4-yloxy)phenyl)-1,2,4-thiadiazol-5-amine;

N-(4-(4-(methylsulfonyl)phenylthio)-3-(tetrahydro-2H-pyran-4-yloxy)phenyl)-1H-imidazol-4-amine;

5-methyl-N-(4-(4-(methylsulfonyl)phenylthio)-3-(tetrahydro-2H-pyran-4-yloxy)phenyl)thiazol-2-amine;

ethyl

6-(4-(4-(dimethylcarbamoyl)phenoxy)-3-((3-oxocyclopentyl)methyl)phenylamino)nicotinate;

N,N-dimethyl-4-(4-(5-methylthiazol-2-ylamino)-2-((3-oxocyclopentyl)methyl)phenoxy)benzamide;

N,N-dimethyl-4-(2-((3-oxocyclopentyl)methyl)-4-(pyrazin-2-ylamino)phenoxy)benzamide;

N,N-dimethyl-4-(4-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-((3-oxocyclopentyl)methyl)phenoxy)benzamide;

4-(4-(1H-imidazol-4-ylamino)-2-((3-oxocyclopentyl)methyl)phenoxy)-N,N-dimethylbenzamide;

N,N-dimethyl-4-(2-((3-oxocyclopentyl)methyl)-4-(5-(trifluoromethyl)pyridin-2-ylamino)phenoxy)benzamide;

N,N-dimethyl-5-(2-((2-oxopyrrolidin-1-yl)methyl)-4-(pyridin-2-ylamino)phenoxy)picolinamide;

5-(4-(5-(ethylcarbamoyl)pyridin-2-ylamino)-2-((2-oxopyrrolidin-1-yl)methyl)phenoxy)-N,N-dimethylpicolinamide;

N,N-dimethyl-5-(2-((2-oxopyrrolidin-1-yl)methyl)-4-(5-phenylpyridin-2-ylamino)phenoxy)picolinamide;

N,N-dimethyl-5-(2-((2-oxopyrrolidin-1-yl)methyl)-4-(5-(trifluoromethyl)pyridin-2-ylamino)phenoxy)picolinamide;

5-(4-(5-cyanopyridin-2-ylamino)-2-((2-oxopyrrolidin-1-yl)methyl)phenoxy)-N,N-dimethylpicolinamide;

6-(4-(6-(dimethylcarbamoyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinic acid;

ethyl 6-(4-(6-(dimethylcarbamoyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)nicotinate;

N,N-dimethyl-5-(4-(5-methylpyridin-2-ylamino)-2-((2-oxopyrrolidin-1-yl)methyl)phenoxy)picolinamide;

N,N-dimethyl-5-(2-((2-oxopyrrolidin-1-yl)methyl)-4-(pyrazin-2-ylamino)phenoxy)picolinamide;

N,N-dimethyl-5-(4-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-((2-oxopyrrolidin-1-yl)methyl)phenoxy)picolinamide;

5-(4-(1H-imidazol-4-ylamino)-2-((2-oxopyrrolidin-1-yl)methyl)phenoxy)-N,N-dimethylpicolinamide;

N,N-dimethyl-5-(4-(5-methylthiazol-2-ylamino)-2-((2-oxopyrrolidin-1-yl)methyl)phenoxy)

picolinamide;

2-(6-(4-(6-(dimethylcarbamoyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)pyridin-3-yl)acetic acid;

3-(6-(4-(6-(dimethylcarbamoyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)pyridin-3-yl)propanoic acid;

5-(4-(5-methoxypyridin-2-ylamino)-2-((2-oxopyrrolidin-1-yl)methyl)phenoxy)-N,N-dimethylpicolinamide;

N,N-dimethyl-4-(5-(pyridin-2-ylamino)-3-((tetrahydrofuran-3-yl)methyl)pyridin-2-yloxy)benzamide;

6-(6-(4-(dimethylcarbamoyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-ylamino)-N-ethylnicotinamide;

N,N-dimethyl-4-(5-(5-phenylpyridin-2-ylamino)-3-((tetrahydrofuran-3-yl)methyl)pyridin-2-yloxy)benzamide;

N,N-dimethyl-4-(3-((tetrahydrofuran-3-yl)methyl)-5-(5-(trifluoromethyl)pyridin-2-ylamino)pyridin-2-yloxy)benzamide;

4-(5-(5-cyanopyridin-2-ylamino)-3-((tetrahydrofuran-3-yl)methyl)pyridin-2-yloxy)-N,N-dimethylbenzamide;

6-(6-(4-(dimethylcarbamoyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-ylamino)nicotinic acid;

6-(4-(4-(dimethylcarbamoyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenylamino)nicotinic acid;

N,N-dimethyl-4-(2-((tetrahydro-2H-pyran-4-yl)methyl)-4-(5-(trifluoromethyl)pyridin-2-ylamino)phenoxy)benzamide;

N,N-dimethyl-4-(4-(pyrazin-2-ylamino)-2-((tetrahydro-2H-pyran-4-yl)methyl)phenoxy)benzamide;

N,N-dimethyl-4-(4-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-((tetrahydro-2H-pyran-4-yl)methyl)phenoxy)benzamide;

4-(4-(1H-imidazol-4-ylamino)-2-((tetrahydro-2H-pyran-4-yl)methyl)phenoxy)-N,N-dimethylbenzamide;

N,N-dimethyl-4-(4-(5-methylthiazol-2-ylamino)-2-((tetrahydro-2H-pyran-4-yl)methyl)phenoxy)benzamide;

6-(3-((1-acetylpyrrolidin-2-yl)methyl)-4-(4-(dimethylcarbamoyl)phenoxy)phenylamino)nicotinic acid;

4-(2-((1-acetylpyrrolidin-2-yl)methyl)-4-(5-(trifluoromethyl)pyridin-2-ylamino)phenoxy)-

N,N-dimethylbenzamide;

4-(2-((1-acetylpyrrolidin-2-yl)methyl)-4-(pyrazin-2-ylamino)phenoxy)-N,N-dimethylbenzamide;

2-(6-(6-(4-(dimethylcarbamoyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-ylamino)pyridin-3-yl)acetic acid;

3-(6-(6-(4-(dimethylcarbamoyl)phenoxy)-5-((tetrahydrofuran-3-yl)methyl)pyridin-3-ylamino)pyridin-3-yl)propanoic acid;

2-(6-(4-(4-(dimethylcarbamoyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenylamino)pyridin-3-yl)acetic acid;

3-(6-(4-(4-(dimethylcarbamoyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenylamino)pyridin-3-yl)propanoic acid;

2-(6-(3-((1-acetylpyrrolidin-2-yl)methyl)-4-(4-(dimethylcarbamoyl)phenoxy)phenylamino)pyridin-3-yl)acetic acid;

3-(6-(3-((1-acetylpyrrolidin-2-yl)methyl)-4-(4-(dimethylcarbamoyl)phenoxy)phenylamino)pyridin-3-yl)propanoic acid;

2-(6-(4-(6-(methylsulfonyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)pyridin-3-yl)acetic acid;

3-(6-(4-(6-(methylsulfonyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)pyridin-3-yl)propanoic acid;

2-(6-(4-(6-(methoxymethyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)pyridin-3-yl)acetic acid;

or

3-(6-(4-(6-(methoxymethyl)pyridin-3-yloxy)-3-((2-oxopyrrolidin-1-yl)methyl)phenylamino)pyridin-3-yl)propanoic acid..

28. A pharmaceutical composition, comprising a therapeutically effective amount of at least one compound according to any one of Claims 1-27, and at least one pharmaceutically acceptable excipient, adjuvant or carrier.

29. Use of at least one compound according to any one of Claims 1-27 or the pharmaceutical composition according to Claim 28 in manufacturing a medicament.

30. The use of Claim 29, wherein the medicament can be used for modulating glucokinase levels or activities in animals or humans.

31. The use of Claim 29, wherein the medicament can be used for the treatment and/or the prevention of type II diabetes or related diseases thereof.

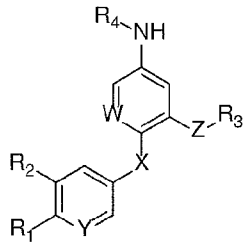
32. The use of Claim 29, wherein the medicament can be used for the treatment and/or the

prevention of type I diabetes or related diseases thereof.

33. The use of Claim 29, wherein the medicament can be used for the treatment and/or the prevention of obesity or related diseases thereof.

CLAIMS

1. A compound of Formula (I), or pharmaceutically acceptable salts thereof, solvates thereof, chelates thereof, non-covalent complexes thereof, or prodrugs of the compounds mentioned above, or the mixture of any form above mentioned,



Formula (I)

wherein:

W and Y are each C;

X is O;

Z is C;

$R_1$ is selected from the group consisting of -H, alkanyl, substituted alkanyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, alkoxy, substituted alkoxy, $C(=O)R_5$, $SR_5$, $SO_2R_5$ and haloalkyl; $R_5$ is selected from the group consisting of lower alkanyl, substituted lower alkanyl, alkoxy, substituted alkoxy and $NR_6R_7$; $R_6$ and $R_7$ are independently selected from the group consisting of -H, lower alkanyl and substituted lower alkanyl, or $R_6$ and $R_7$ can join together to form a 3 to 6 membered ring or a substituted 3 to 6 membered ring;

$R_2$ is selected from the group consisting of -H, alkanyl, substituted alkanyl, halogen and haloalkyl;

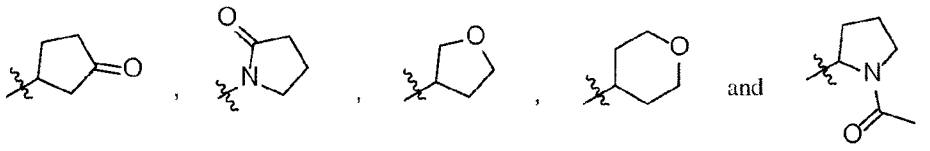
$R_3$ is selected from the group consisting of substituted alkanyl, alkenyl, substituted alkenyl, alkynyl, substituted alkynyl, cycloalkyl, substituted cycloalkyl, heterocycloalkyl and substituted heterocycloalkyl;

$R_4$ is selected from the group consisting of heteroaryl and substituted heteroaryl, wherein one ortho atom of the heteroaryl connected with NH in Formula (I) is N.

2. A compound of Claim 1, wherein $R_1$ is selected from -H, lower alkanyl, substituted lower alkanyl, lower alkenyl, substituted lower alkenyl, lower alkynyl, substituted lower alkynyl, $C_{1-6}$alkoxy and substituted $C_{1-6}$alkoxy.

3. A compound of Claim 2, wherein $R_2$ is -H; $R_3$ is selected from the group consisting of cycloalkyl, substituted cycloalkyl, heterocycloalkyl and substituted heterocycloalkyl; $R_4$ is selected from 5 or 6 membered heteroaryl.

4. A compound of Claim 3, wherein $R_3$ is selected from



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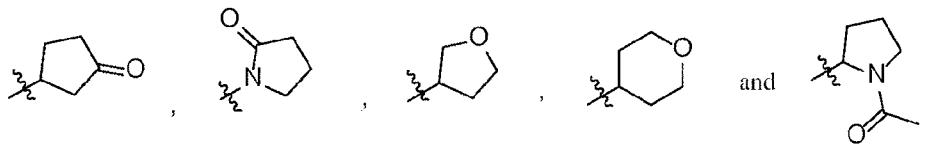
5. A compound of Claim 1 or 4, wherein $R_4$ is selected from substituted 5 or 6 membered heteroaryl, where one substitution is $C_{1-3}$ carboxylate.

6. A compound of Claim 1, wherein $R_1$ is selected from $C(=O)R_5$, $SR_5$, $SO_2R_5$ and haloalkyl; $R_5$ is selected from $C_{1-3}$alkanyl, substituted

10 $C_{1-3}$alkanyl, $NR_6R_7$, $C_{1-6}$alkoxy and substituted $C_{1-6}$alkoxy.

7. A compound of Claim 6, wherein $R_2$ is -H; $R_3$ is selected from cycloalkanyl, substituted cycloalkanyl, heterocycloalkyl and substituted heterocycloalkyl; $R_4$ is selected from substituted 5- or 6-membered heteroaryl.

8. A compound of Claim 7, wherein $R_3$ is selected from



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9. A compound of Claim 6, wherein $R_1$ is $C(=O)R_5$; $R_5$ is $NR_6R_7$.

10. A compound of Claim 6, wherein $R_1$ is $SO_2R_5$; $R_5$ is selected from $C_{1-3}$alkanyl.

11. A compound of Claim 9 or 10, wherein $R_4$ is selected from substituted 5 or 6

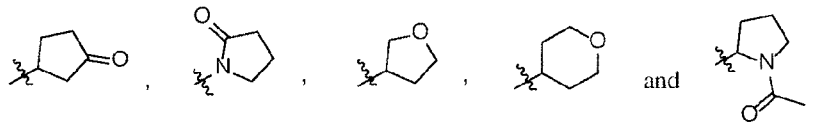
20 membered heteroaryl, where one substitution is $C_{1-3}$ carboxylate.

12. A compound of Claim 6, wherein $R_6$ and $R_7$ are independently selected from -H, $C_{1-4}$alkanyl and substituted $C_{1-4}$alkanyl.

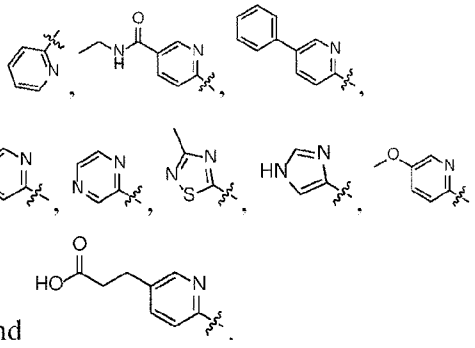
13. A compound of Claim 6, wherein $R_6$ and $R_7$ can join together to form a 3 to 6 membered ring or a substituted 3 to 6 membered ring containing heteroatoms selected

25 from O or S.

14. A compound of Claim 1, wherein $R_3$ is selected from

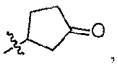
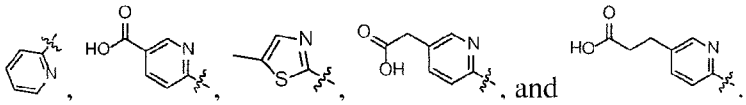


15. A compound of Claim 14, wherein $R_4$ is a 5- or 6-membered heteroaryl or a substituted 5- or 6-membered heteroaryl.

16. A compound of Claim 15, wherein $R_4$ is 

17. A compound of Claim 16, wherein $R_1$ is selected from lower alkanyl, $C_{1-6}$alkoxy, $C(=O)R_5$, and $SO_2R_5$, where $R_5$ is selected from lower alkanyl and $NR_6R_7$, where $R_6$ and $R_7$ are independently selected from –H and lower alkanyl, or $R_6$ and $R_7$ can join together to form a 3 to 6 membered ring.

18. A compound of Claim 17, wherein $R_2$ is selected from -H and halogen.

19. A compound of Claim 18, wherein $R_3$ is selected from  and , and $R_4$ is selected from 

20. A compound of Claim 18 or 19, wherein $R_2$ is –H, $R_1$ is selected from $C(=O)NR_6R_7$ and $SO_2R_5$; $R_5$ is selected from $C_{1-3}$alkanyl.

21. A compound of Claim 1, wherein the compound is selected from:

ethyl 6-(4-(4-(methylsulfonyl)phenoxy)-3-((3-oxocyclopentyl)methyl) phenylamino)nicotinate;

3-(2-(4-(methylsulfonyl)phenoxy)-5-(5-methylthiazol-2-ylamino)benzyl) cyclopentanone;

3-(2-(4-(methylsulfonyl)phenoxy)-5-(pyrazin-2-ylamino)benzyl)cyclopentanone;

3-(5-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-(4-(methylsulfonyl)phenoxy) benzyl)cyclopentanone;

3-(5-(1H-imidazol-4-ylamino)-2-(4-(methylsulfonyl)phenoxy)benzyl)

cyclopentanone;

3-(2-(4-(methylsulfonyl)phenoxy)-5-(5-(trifluoromethyl)pyridin-2-ylamino) benzyl)cyclopentanone;

ethyl 6-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl) phenylamino)nicotinate;

N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenyl)-5-(trifluoromethyl)pyridin-2-amine;

N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl) phenyl)pyrazin-2-amine;

3-methyl-N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl) phenyl)-1,2,4-thiadiazol-5-amine;

N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl)phenyl)-1H-imidazol-4-amine;

5-methyl-N-(4-(4-(methylsulfonyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl) phenyl)thiazol-2-amine;

ethyl 6-(3-((1-acetylpyrrolidin-2-yl)methyl)-4-(4-(methylsulfonyl) phenoxy)phenylamino)nicotinate;

1-(2-(2-(4-(methylsulfonyl)phenoxy)-5-(5-(trifluoromethyl)pyridin-2-ylamino) benzyl)pyrrolidin-1-yl)ethanone;

1-(2-(2-(4-(methylsulfonyl)phenoxy)-5-(pyrazin-2-ylamino)benzyl)pyrrolidin-1-yl)ethanone;

1-(2-(5-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-(4-(methylsulfonyl) phenoxy)benzyl)pyrrolidin-1-yl)ethanone;1-(2-(5-(1H-imidazol-4-ylamino)-2-(4-(methylsulfonyl)phenoxy)benzyl)pyrrolidin-1-yl)ethanone;

1-(2-(2-(4-(methylsulfonyl)phenoxy)-5-(5-methylthiazol-2-ylamino)benzyl) pyrrolidin-1-yl)ethanone;

ethyl 6-(4-(4-(dimethylcarbamoyl)phenoxy)-3-((3-oxocyclopentyl)methyl) phenylamino)nicotinate;

N,N-dimethyl-4-(4-(5-methylthiazol-2-ylamino)-2-((3-oxocyclopentyl)methyl) phenoxy)benzamide;

N,N-dimethyl-4-(2-((3-oxocyclopentyl)methyl)-4-(pyrazin-2-ylamino) phenoxy)benzamide;

N,N-dimethyl-4-(4-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-((3-oxocyclopentyl) methyl)phenoxy)benzamide;

4-(4-(1H-imidazol-4-ylamino)-2-((3-oxocyclopentyl)methyl)phenoxy)-N,N-dimethylbenzamide;

N,N-dimethyl-4-(2-((3-oxocyclopentyl)methyl)-4-(5-(trifluoromethyl)pyridin-2-ylamino)phenoxy)benzamide;

6-(4-(4-(dimethylcarbamoyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl) phenylamino)nicotinic acid;

N,N-dimethyl-4-(2-((tetrahydro-2H-pyran-4-yl)methyl)-4-(5-(trifluoromethyl) pyridin-2-ylamino)phenoxy)benzamide;

N,N-dimethyl-4-(4-(pyrazin-2-ylamino)-2-((tetrahydro-2H-pyran-4-yl)methyl) phenoxy)benzamide;

N,N-dimethyl-4-(4-(3-methyl-1,2,4-thiadiazol-5-ylamino)-2-((tetrahydro-2H-pyran-4-yl)methyl)phenoxy)benzamide;

4-(4-(1H-imidazol-4-ylamino)-2-((tetrahydro-2H-pyran-4-yl)methyl)phenoxy)-N,N-dimethylbenzamide;

N,N-dimethyl-4-(4-(5-methylthiazol-2-ylamino)-2-((tetrahydro-2H-pyran-4-yl) methyl)phenoxy)benzamide;

6-(3-((1-acetylpyrrolidin-2-yl)methyl)-4-(4-(dimethylcarbamoyl)phenoxy) phenylamino)nicotinic acid;

4-(2-((1-acetylpyrrolidin-2-yl)methyl)-4-(5-(trifluoromethyl)pyridin-2-ylamino) phenoxy)-N,N-dimethylbenzamide;

4-(2-((1-acetylpyrrolidin-2-yl)methyl)-4-(pyrazin-2-ylamino)phenoxy)-N,N-dimethylbenzamide;

2-(6-(4-(4-(dimethylcarbamoyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl) phenylamino)pyridin-3-yl)acetic acid;

3-(6-(4-(4-(dimethylcarbamoyl)phenoxy)-3-((tetrahydro-2H-pyran-4-yl)methyl) phenylamino)pyridin-3-yl)propanoic acid;

2-(6-(3-((1-acetylpyrrolidin-2-yl)methyl)-4-(4-(dimethylcarbamoyl)phenoxy) phenylamino)pyridin-3-yl)acetic acid; and

3-(6-(3-((1-acetylpyrrolidin-2-yl)methyl)-4-(4-(dimethylcarbamoyl)phenoxy) phenylamino)pyridin-3-yl)propanoic acid.

22. A pharmaceutical composition, comprising a therapeutically effective amount of at least one compound according to any one of Claims 1-21, and at least one pharmaceutically acceptable excipient, adjuvant or carrier.

23. Use of at least one compound according to any one of Claims 1-21 or a pharmaceutical composition according to Claim 22 in manufacturing a medicament.

24. The use of Claim 23, wherein the medicament is used for modulating glucokinase levels or activities in animals or humans, for the treatment and/or the prevention of type II diabetes or related diseases thereof, for the treatment and/or the prevention of type I diabetes or related diseases thereof, or for the treatment and/or the prevention of obesity or related diseases thereof.