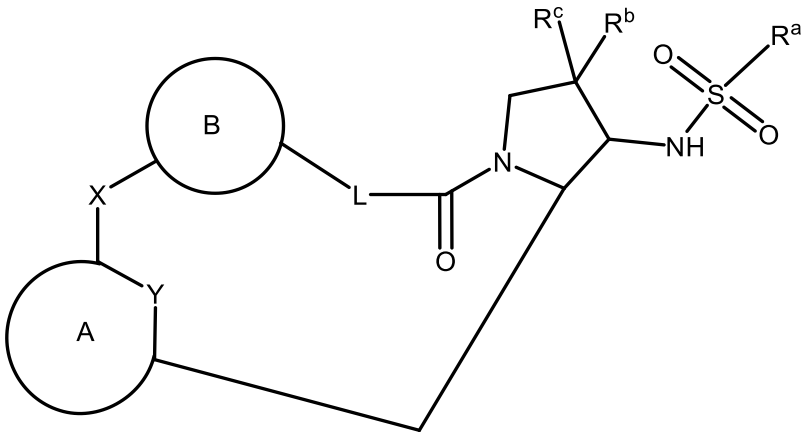
CLAIMS

1. A compound of formula (I)



(I),

wherein

Ring A is an optionally substituted C_{6-14} aryl group, or an optionally substituted 5- or 6-membered monocyclic aromatic heterocyclic group, where Y is a ring atom C or N, where the C is attached to hydrogen or an optional substituent;

X is -O-, -S-, $-NR^1-$, $-CR^2R^3-$, $-O-(CR^2R^3)-$, $-(CR^2R^3)-O-$, or an optionally substituted C_{3-6} cycloalkyl group, wherein the left hand portion of X is attached to a ring carbon atom on Ring A that is adjacent to Y and the right hand portion of X is attached to Ring B;

R^1 is hydrogen, or an optionally substituted C_{1-6} alkyl group;

R^2 and R^3 are independently hydrogen, halogen, or an optionally substituted C_{1-6} alkyl group;

Ring B is an optionally substituted C_{6-14} aryl group, or an optionally substituted 5- or 6-membered monocyclic aromatic heterocyclic group;

L is $-C(R^4R^5)-NR^6-$, $-C(R^4R^5)-O-$, $-O-C(R^4R^5)-$, $-NR^6-C(R^4R^5)-$, $-C(R^4R^5)-C(R^7R^8)-$, wherein the left hand portion of L is attached to Ring B and the right hand portion of L is attached to the carbonyl group;

R^4 and R^5 are independently hydrogen, halogen, or an optionally substituted C_{1-6} alkyl group;

R^6 is hydrogen, or an optionally substituted C_{1-6} alkyl group;

R^7 and R^8 are independently hydrogen, halogen, or an optionally substituted C_{1-6} alkyl group; or

R^4 and R^6, taken together with the atoms to which they are attached, form an optionally substituted 3- to 8-membered monocyclic non-aromatic heterocyclic ring; or

R^4 and R^5, or R^4 and R^7, taken together with the atom or atoms to which they are attached form an optionally substituted 3- to 8-membered monocyclic non-aromatic heterocyclic ring, or an optionally substituted C_{3-10} cycloalkyl group;

R^a is a C_{1-6} alkyl group, a C_{3-4} cycloalkyl group, or a mono- or di-C_{1-6} alkylamino group, wherein each of C_{1-6} alkyl group, C_{3-6} cycloalkyl group, and mono- or di-C_{1-6} alkylamino group is optionally substituted;

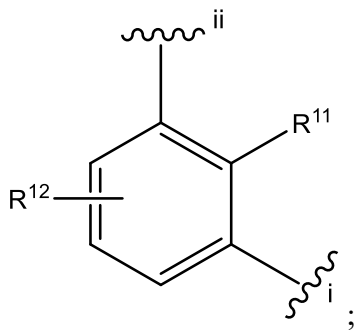
R^b is a hydrogen atom or a halogen atom; and

R^c is a hydrogen atom or a halogen atom;

or a salt thereof.

2. The compound according to claim 1, wherein

Ring A is



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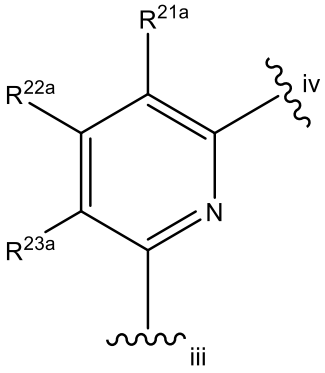
wherein i is the point of attachment to the bridge methylene and ii is the point of attachment to X; and

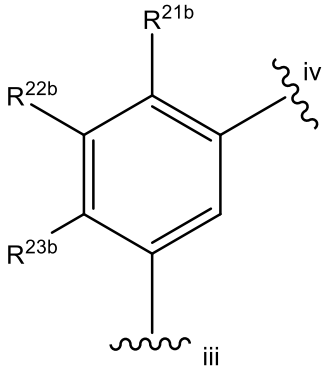
R^{11} and R^{12} are independently hydrogen, halogen, or optionally halogenated C_{1-6} alkyl group;

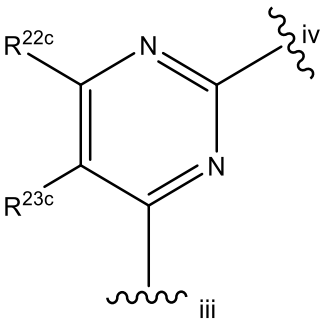
or a salt thereof.

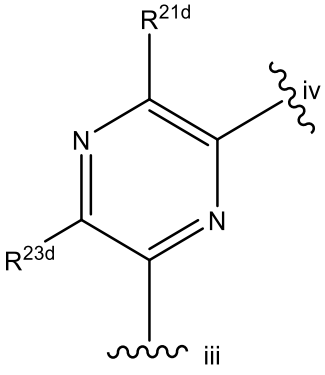
3. The compound according to claim 1, wherein

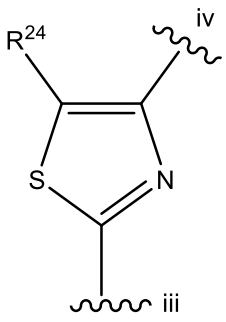
Ring B is selected from:



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,


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,and


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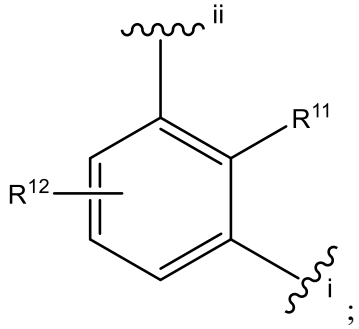
wherein iv is the point of attachment to L and iii is the point of attachment to X;

R^{21a}, R^{21b}, R^{21d}, R^{22a}, R^{22b}, R^{22c}, R^{23a}, R^{23b}, R^{23c} and R^{23d} are independently selected from hydrogen, halogen, an optionally halogenated C_{1-6} alkyl group, C_{1-6} alkoxyl group and a C_{3-6} cycloalkyl group; and

R^{24} is selected from hydrogen, halogen, an optionally halogenated C_{1-6} alkyl group, and a C_{3-6} cycloalkyl group;

or a salt thereof.

4. The compound according to claim 1, wherein

Ring A is 

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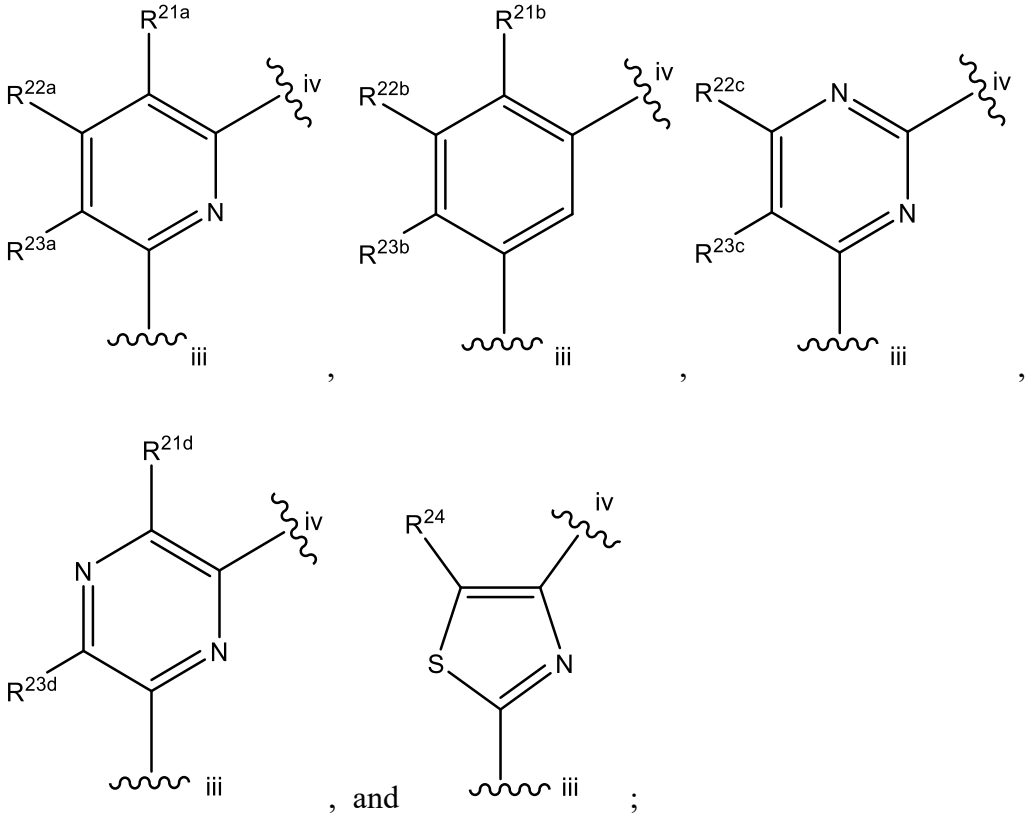
wherein i is the point of attachment to the bridge methylene and ii is the point of attachment to X; and

R^{11} and R^{12} are independently hydrogen, halogen, or C_{1-6} alkyl group;

X is $-O-$, $-CR^2R^3-$, $-O-(CR^2R^3)-$, or $-(CR^2R^3)-O-$, wherein the left hand portion of X is attached to a ring carbon atom on Ring A that is adjacent to Y and the right hand portion of X is attached to Ring B;

R^2 and R^3 are independently hydrogen, halogen, or C_{1-6} alkyl group optionally substituted by 1 to 3 substituents independently selected from halogen and C_{1-6} alkyl group;

Ring B is selected from:



, and ;

wherein iv is the point of attachment to L and iii is the point of attachment to X;

R^{21a}, R^{21b}, R^{21d}, R^{22a}, R^{22b}, R^{22c}, R^{23a}, R^{23b}, R^{23c} and R^{23d} are independently selected from hydrogen, halogen, an optionally halogenated C_{1-6} alkyl group, C_{1-6} alkoxyl group and a C_{3-6} cycloalkyl group;

R^{24} is hydrogen or a C_{1-6} alkyl group;

L is $-C(R^4R^5)-NR^6-$, $-C(R^4R^5)-O-$, $-O-C(R^4R^5)-$, $-NR^6-C(R^4R^5)-$, or $-C(R^4R^5)-C(R^7R^8)-$, wherein the left hand portion of L is attached to Ring B and the right hand portion of L is attached to the carbonyl group;

R^4 and R^5 are independently hydrogen, or C_{1-6} alkyl group;

R^6 is hydrogen, or an optionally halogenated C_{1-6} alkyl group;

R^7 and R^8 are independently hydrogen; or

when L is $-C(R^4R^5)-NR^6-$ or $-NR^6-C(R^4R^5)-$, R^4 and R^6 together with the atoms to which they are attached form a 3- to 8-membered monocyclic non-aromatic heterocyclic ring optionally substituted by 1 to 3 substituents independently selected from halogen and C_{1-6} alkoxyl group, and R^5 is hydrogen; or

when L is $-C(R^4R^5)-C(R^7R^8)-$, R^4 and R^7 together with the carbon atoms to which they are attached form a C_{3-10} cycloalkyl group, and R^5 and R^8 are both hydrogen;

R^a is a C_{1-6} alkyl group optionally substituted by 1 to 3 substituents independently selected from halogen atoms and C_{1-6} alkoxyl group, a C_{3-4} cycloalkyl group, or a mono- or di-C_{1-6} alkylamino group;

R^b is a hydrogen atom or a halogen atom; and

R^c is a hydrogen atom or a halogen atom;

or a salt thereof.

5. The compound according to claim 1, wherein

Ring A is a phenyl group optionally further substituted by 1 to 2 halogen atoms, where Y is a ring atom C attached to hydrogen or halogen;

X is -O-, wherein the left hand portion of X is attached to a ring carbon atom on Ring A that is adjacent to Y and the right hand portion of X is attached to Ring B;

Ring B is a pyridine ring optionally substituted by 1, 2 or 3 substituents independently selected from halogen and C_{1-6} alkyl group;

L is $-CH_2-NH-$, wherein the left hand portion of L is attached to Ring B and the right hand portion of L is attached to the carbonyl group;

R^a is a C_{1-6} alkyl group optionally substituted by 1 to 3 halogen atoms, or a C_{3-4} cycloalkyl group;

R^b is a halogen atom; and

R^c is a halogen atom;

or a salt thereof.

6. The compound according to claim 1, wherein

Ring A is a phenyl group optionally further substituted by 1 to 2 halogen atoms, where Y is a ring atom C attached to halogen;

X is -O-, wherein the left hand portion of X is attached to a ring carbon atom on Ring A that is adjacent to Y and the right hand portion of X is attached to Ring B;

Ring B is a pyridine ring optionally substituted by 1, 2 or 3 C_{1-6} alkyl groups;

L is $-CH_2-NH-$, wherein the left hand portion of L is attached to Ring B and the right hand portion of L is attached to the carbonyl group;

R^a is a C_{1-6} alkyl group optionally substituted by 1 to 3 halogen atoms;

R^b is a halogen atom; and

R^c is a halogen atom;

or a salt thereof.

7. The compound according to claim 1, wherein the compound is selected from the group consisting of:

N-[(15aS,16R)-17,17-difluoro-7-methyl-1-oxo-2,3,15a,16,17,18-hexahydro-1H,15H-4,8-(azeno)-10,14-(metheno)pyrrolo[1,2-j][1,8,10]oxadiazacycloheptadecin-16-yl]methanesulfonamide;

N-[(15aS,16R)-17,17,20-trifluoro-7-methyl-1-oxo-2,3,15a,16,17,18-hexahydro-1H,15H-4,8-(azeno)-10,14-(metheno)pyrrolo[1,2-j][1,8,10]oxadiazacycloheptadecin-16-yl]methanesulfonamide;

N-[(15aS,16R)-17,17,20-trifluoro-7-methyl-1-oxo-2,3,15a,16,17,18-hexahydro-1H,15H-4,8-(azeno)-10,14-(metheno)pyrrolo[1,2-j][1,8,10]oxadiazacycloheptadecin-16-yl]ethanesulfonamide;

1-fluoro-N-[(15aS,16R)-17,17,20-trifluoro-7-methyl-1-oxo-2,3,15a,16,17,18-hexahydro-1H,15H-4,8-(azeno)-10,14-(metheno)pyrrolo[1,2-j][1,8,10]oxadiazacycloheptadecin-16-yl]methanesulfonamide;

N-[(15aS,16R)-7-chloro-17,17,20-trifluoro-1-oxo-2,3,15a,16,17,18-hexahydro-1H,15H-4,8-(azeno)-14,10-(metheno)pyrrolo[1,2-j][1,8,10]oxadiazacycloheptadecin-16-yl]cyclopropanesulfonamide;

N-[(15aS,16R)-5,17,17,20-tetrafluoro-7-methyl-1-oxo-2,3,15a,16,17,18-hexahydro-1H,15H-4,8-(azeno)-14,10-(metheno)pyrrolo[1,2-j][1,8,10]oxadiazacycloheptadecin-16-yl]methanesulfonamide;

N-[(15aS,16R)-7-chloro-5,17,17,20-tetrafluoro-1-oxo-2,3,15a,16,17,18-hexahydro-1H,15H-4,8-(azeno)-14,10-(metheno)pyrrolo[1,2-j][1,8,10]oxadiazacycloheptadecin-16-yl]cyclopropanesulfonamide; and

N-[(15aS,16R)-17,17,20-trifluoro-7-methyl-1-oxo-2,3,15a,16,17,18-hexahydro-1H,15H-4,8-(azeno)-14,10-(metheno)pyrrolo[1,2-j][1,8,10]oxadiazacycloheptadecin-16-yl]propane-2-sulfonamide;

or a salt thereof.

8. A pharmaceutical composition comprising the compound as defined in any one of claims 1 to 7 or a salt thereof, and a pharmacologically acceptable carrier.

9. A medicament comprising the compound as defined in any one of claims 1 to 7 or a salt thereof.

10. The compound as defined in any one of claims 1 to 7, or a salt thereof, for use in therapy.

11. The compound or salt according to claim 10, wherein the therapy comprises treatment of a disease or disorder associated with an orexin type 2 receptor.

12. The compound or salt according to claim 11, wherein the disease or disorder is selected from the group consisting of narcolepsy, idiopathic hypersomnia, hypersomnia, sleep apnea syndrome, narcolepsy syndrome accompanied by narcolepsy-like symptoms, hypersomnia syndrome accompanied by daytime hypersomnia, Alzheimer’s disease, obesity, insulin resistance syndrome, cardiac failure, diseases related to bone loss, sepsis, disturbance of consciousness, and side effects and complications due to anesthesia.

13. The compound or salt according to claim 11, wherein the disease or disorder is selected from the group consisting of narcolepsy, idiopathic hypersomnia, hypersomnia, and sleep apnea syndrome.

14. The compound or salt according to claim 11, wherein the disease or disorder is narcolepsy.

15. Use of the compound as defined in any one of claims 1 to 7 or a salt thereof, in the manufacture of a medicament for the prophylaxis or treatment of a disease or disorder associated with an orexin type 2 receptor.

16. The use according to claim 15, wherein the disease or disorder is selected from the group consisting of narcolepsy, idiopathic hypersomnia, hypersomnia, sleep apnea syndrome, narcolepsy syndrome accompanied by narcolepsy-like symptoms, hypersomnia syndrome accompanied by daytime hypersomnia, Alzheimer's disease, obesity, insulin resistance syndrome, cardiac failure, diseases related to bone loss, sepsis, disturbance of consciousness, and side effects and complications due to anesthesia.

17. The use according to claim 15, wherein the disease or disorder is selected from the group consisting of narcolepsy, idiopathic hypersomnia, hypersomnia, and sleep apnea syndrome.

18. The use according to claim 15, wherein the disease or disorder is narcolepsy.