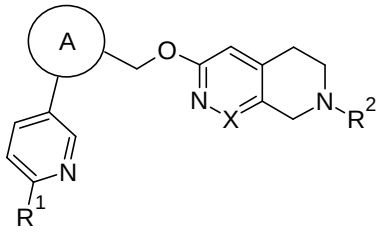
**Claims**

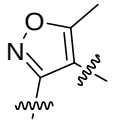
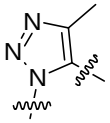
1. A compound of formula (I)



(I)

wherein

A is represented by

 group, or  group;

$R^1$ is an alkyl, an alkoxy, or a haloalkyl group;

$R^2$ is hydrogen; an alkyl group optionally substituted with -$S(O)_2$-alkyl, cycloalkyl or heterocycle; a cycloalkyl group; a heterocycle group optionally substituted with an alkyl; or a heteroaryl group;

X is CH, or N;

and/or salts thereof and/or stereoisomers thereof and/or enantiomers thereof and/or racemates thereof or diastereomers thereof and/or biologically active metabolites thereof or prodrugs thereof or solvates thereof or hydrates thereof and/or polymorphs thereof.

2. The compound according to claim 1, wherein

$R^1$ is a $C_{1-6}$alkyl, a $C_{1-6}$alkoxy, or a halo-$C_{1-6}$alkyl group;

$R^2$ is hydrogen; a $C_{1-6}$alkyl group optionally substituted with -$S(O)_2$-$C_{1-6}$alkyl, $C_{3-7}$cycloalkyl or a monovalent saturated or partly unsaturated monocyclic, bicyclic, fused, bridged or spiro ring system of 3 to 10 ring atoms comprising 1, 2, 3 or 4 ring heteroatoms independently selected from N, O and S, the remaining ring atoms being carbon; a $C_{3-7}$cycloalkyl group; a monovalent saturated or partly unsaturated monocyclic, bicyclic, fused, bridged or spiro ring

system of 3 to 10 ring atoms comprising 1, 2, 3 or 4 ring heteroatoms independently selected from N, O and S, the remaining ring atoms being carbon optionally substituted with a $C_{1-6}$alkyl; or a monovalent, heterocyclic aromatic, mono- or bicyclic ring system of 5 to 10 ring atoms, comprising 1, 2 or 3 heteroatoms independently selected from N, O and S, the remaining ring atoms being carbon.

3. The compound according to any one of claims 1 to 2, wherein $R^1$ is a $C_{1-4}$alkyl, a $C_{1-4}$alkoxy, or a halo-$C_{1-4}$alkyl group.

4. The compound according to any one of claims 1 to 3, wherein $R^1$ is a $C_{1-2}$alkyl, a $C_{1-2}$alkoxy, or a halo-$C_{1-2}$alkyl group.

5. The compound according to any one of claims 1 to 4, wherein $R^2$ is hydrogen; a $C_{1-4}$alkyl group optionally substituted with -$S(O)_2$-$C_{1-4}$alkyl, a $C_{4-6}$cycloalkyl or a monovalent saturated monocyclic ring of 3 to 7 ring atoms comprising 1, or 2 ring heteroatoms independently selected from N, O and S, the remaining ring atoms being carbon; a $C_{4-6}$cycloalkyl group; a monovalent saturated monocyclic ring of 3 to 7 ring atoms comprising 1, or 2 ring heteroatoms independently selected from N, O and S, the remaining ring atoms being carbon optionally substituted with a $C_{1-4}$alkyl; or a monovalent, heterocyclic aromatic, monocyclic ring system of 5 to 6 ring atoms, comprising 1, or 2 heteroatoms independently selected from N, O and S, the remaining ring atoms being carbon.

6. The compound according to any one of claims 1 to 5, wherein $R^2$ is hydrogen; a $C_{1-4}$alkyl group optionally substituted with -$S(O)_2$-$C_{1-2}$alkyl, $C_{4-6}$cycloalkyl or a a monovalent saturated monocyclic ring of 3 to 7 ring atoms comprising one ring heteroatom selected from O and S, the remaining ring atoms being carbon; a $C_{4-6}$cycloalkyl group; a monovalent saturated monocyclic ring of 3 to 7 ring atoms comprising one ring heteroatom selected from O and S, the remaining ring atoms being carbon optionally substituted with a $C_{1-4}$alkyl; or a monovalent, heterocyclic aromatic, monocyclic ring system of 6 ring atoms, comprising 1, or 2 heteroatoms independently selected from N, O and S, the remaining ring atoms being carbon.

7. The compound according to any one of claims 1 to 6 selected from the group consisting of

6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({5-methyl-3-[6-(trifluoromethyl)pyridin-3-yl]-1,2-oxazol-4-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-methyl-6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-cyclobutyl-6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-(cyclobutylmethyl)-6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-cyclopentyl-6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({5-methyl-3-[6-(trifluoromethyl)pyridin-3-yl]-1,2-oxazol-4-yl}methoxy)-2-(oxan-4-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({5-methyl-3-[6-(trifluoromethyl)pyridin-3-yl]-1,2-oxazol-4-yl}methoxy)-2-(oxolan-3-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-2-(oxolan-3-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-2-(oxetan-3-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-2-(oxan-4-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-(1-methanesulfonylpropan-2-yl)-6-({5-methyl-3-[6-(trifluoromethyl)pyridin-3-yl]-1,2-oxazol-4-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-2-(pyridin-2-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-methyl-5-[5-methyl-4-({5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yloxy}methyl)-1,2-oxazol-3-yl]pyridine,

5-[5-methyl-4-({5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yloxy}methyl)-1,2-oxazol-3-yl]-2-(trifluoromethyl)pyridine,

2-methyl-5-{5-methyl-4-[({7-methyl-5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yl}oxy)methyl]-1,2-oxazol-3-yl}pyridine,

5-[5-methyl-4-({5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yloxy}methyl)-1,2-oxazol-3-yl]-2-(trifluoromethyl)pyridine,

5-[5-methyl-4-({[7-(oxolan-3-yl)-5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yl]oxy}methyl)-1,2-oxazol-3-yl]-2-(trifluoromethyl)pyridine,

3-{[3-({5-methyl-3-[6-(trifluoromethyl)pyridin-3-yl]-1,2-oxazol-4-yl}methoxy)-5H,6H,7H,8H-pyrido[3,4-c]pyridazin-7-yl]methyl}-1lambda6-thiolane-1,1-dione,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-methyl-6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-2-(propan-2-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({1-[6-(difluoromethyl)pyridin-3-yl]-4-methyl-1H-1,2,3-triazol-5-yl}methoxy)-2-methyl-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({4-methyl-1-[6-(trifluoromethyl)pyridin-3-yl]-1H-1,2,3-triazol-5-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({1-[6-(difluoromethyl)pyridin-3-yl]-4-methyl-1H-1,2,3-triazol-5-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({4-methyl-1-[6-(trifluoromethyl)pyridin-3-yl]-1H-1,2,3-triazol-5-yl}methoxy)-2-(propan-2-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-methyl-6-({4-methyl-1-[6-(trifluoromethyl)pyridin-3-yl]-1H-1,2,3-triazol-5-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({1-[6-(difluoromethyl)pyridin-3-yl]-4-methyl-1H-1,2,3-triazol-5-yl}methoxy)-2-(propan-2-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-2-(oxolan-3-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({1-[6-(difluoromethyl)pyridin-3-yl]-4-methyl-1H-1,2,3-triazol-5-yl}methoxy)-2-(oxolan-3-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-2-(oxetan-3-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({4-methyl-1-[6-(trifluoromethyl)pyridin-3-yl]-1H-1,2,3-triazol-5-yl}methoxy)-2-(oxolan-3-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-2-(oxan-4-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[1-(6-methoxypyridin-3-yl)-4-methyl-1H-1,2,3-triazol-5-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-({4-methyl-1-[6-(trifluoromethyl)pyridin-3-yl]-1H-1,2,3-triazol-5-yl}methoxy)-2-(oxan-4-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

3-{[6-({4-methyl-1-[6-(trifluoromethyl)pyridin-3-yl]-1H-1,2,3-triazol-5-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridin-2-yl]methyl}-1lambda6-thiolane-1,1-dione,

6-({4-methyl-1-[6-(trifluoromethyl)pyridin-3-yl]-1H-1,2,3-triazol-5-yl}methoxy)-2-(pyridin-3-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-2-[(3S)-oxolan-3-yl]-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-2-[(3R)-oxolan-3-yl]-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[1-(6-methoxypyridin-3-yl)-4-methyl-1H-1,2,3-triazol-5-yl]methoxy}-2-(oxan-4-yl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-2-(2-methylpropyl)-1,2,3,4-tetrahydro-2,7-naphthyridine,

6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-2-[3-(propan-2-yl)oxetan-3-yl]-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-(3-ethyloxetan-3-yl)-6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine,

2-methyl-5-[4-methyl-5-({5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yloxy}methyl)-1H-1,2,3-triazol-1-yl]pyridine,

5-[5-({[7-(cyclobutylmethyl)-5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yl]oxy}methyl)-4-methyl-1H-1,2,3-triazol-1-yl]-2-methylpyridine, and

5-{5-[({7-cyclobutyl-5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yl}oxy)methyl]-4-methyl-1H-1,2,3-triazol-1-yl}-2-methylpyridine

and/or salts thereof and/or stereoisomers thereof and/or enantiomers thereof and/or racemates thereof or diastereomers thereof and/or biologically active metabolites thereof or prodrugs thereof or solvates thereof or hydrates thereof and/or polymorphs thereof.

8. The compound according to any one of claims 1 to 7, for use as a medicament.

9. The compound according to any one of claims 1 to 7, for use in the treatment or prevention of diseases related to the $GABA_A$ α5 receptor selected from the group consisting of a neurodevelopmental disorder, a neurodegenerative disorder, a neurocognitive disorder, schizophrenia, a mood disorder, a pain disorder, a substance-related and addictive disorder and other disease.

10. The compound according to claim 9, for use wherein the disease related to the $GABA_A$ α5 receptor is selected from the group consisting of autism spectrum disorder (ASD), Angelman syndrome, Fragile X disorder, Prader-Willi syndrome, Rett syndrome, Alzheimer's disease (AD), cognition deficiency disorders, memory deficits, age-associated memory impairment or cognitive decline, dementia, mild cognitive impairment (MCI), bipolar disorders, negative and/or cognitive symptoms associated with schizophrenia, epilepsy, post-traumatic stress disorder, amyotrophic lateral sclerosis.

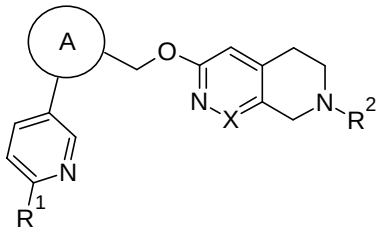
11. The compound according to any one of claims 1 to 7 in combination with one or more other active ingredients, for use in the treatment or prevention of diseases related to the $GABA_A$ α5 receptor selected from the group consisting of a neurodevelopmental disorder, a neurodegenerative disorder, a neurocognitive disorder, schizophrenia, a mood disorder, a pain disorder, a substance-related and addictive disorder and other disease.

12. A pharmaceutical composition comprising as active ingredient at least one compound according to any one of claims 1 to 7 and at least one physiologically or pharmaceutically acceptable excipient and optionally one or more other active ingredients.

13. The pharmaceutical composition according to claim 12, for use in the treatment or prevention of a disease related to the $GABA_A$ α5 receptor selected from the group consisting of a neurodevelopmental disorder, a neurodegenerative disorder, a neurocognitive disorder, schizophrenia, a mood disorder, a pain disorder, a substance-related and addictive disorder and other disease.

14. The pharmaceutical composition according to claim 13, for use wherein the disease related to the $GABA_A$ α5 receptor is selected from the group consisting of autism spectrum disorder (ASD), Angelman syndrome, Fragile X disorder, Prader-Willi syndrome, Rett syndrome, Alzheimer's disease (AD), cognition deficiency disorders, memory deficits, age-associated memory impairment or cognitive decline, dementia, mild cognitive impairment (MCI), bipolar disorders, negative and/or cognitive symptoms associated with schizophrenia, epilepsy, post-traumatic stress disorder, amyotrophic lateral sclerosis.

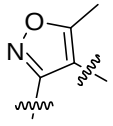
15. A compound of formula (I''),

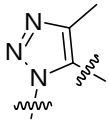



(I'')

wherein

A is represented by



group, or 

group;

$R^1$ is an alkyl, an alkoxy, or a haloalkyl group;

$R^2$ is an amino protecting group selected from carbamate, trifluoroacetamide, benzylamine, allylamine, and tritylamine groups;

X is CH or N;

with the proviso that the compound is not

*tert*-butyl 6-{[5-methyl-3-(6-methylpyridin-3-yl)-1,2-oxazol-4-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine-2-carboxylate, or

*tert*-butyl 6-({5-methyl-3-[6-(trifluoromethyl)pyridin-5 3-yl]-1,2-oxazol-4-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridine-2-carboxylate.

16. A compound selected from the group consisting of:

*tert*-butyl 2-methyl-5-[5-methyl-4-({5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yloxy}methyl)-1,2-oxazol-3-yl]pyridine-2-carboxylate,

*tert*-butyl 5-[5-methyl-4-({5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yloxy}methyl)-1,2-oxazol-3-yl]-2-(trifluoromethyl)pyridine-2-carboxylate,

*tert*-butyl 6-{[4-methyl-1-(6-methylpyridin-3-yl)-1H-1,2,3-triazol-5-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine-2-carboxylate,

*tert*-butyl 6-({4-methyl-1-[6-(trifluoromethyl)pyridin-3-yl]-1H-1,2,3-triazol-5-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridine-2-carboxylate,

*tert*-butyl 6-({1-[6-(difluoromethyl)pyridin-3-yl]-4-methyl-1H-1,2,3-triazol-5-yl}methoxy)-1,2,3,4-tetrahydro-2,7-naphthyridine-2-carboxylate,

*tert*-butyl 6-{[1-(6-methoxypyridin-3-yl)-4-methyl-1H-1,2,3-triazol-5-yl]methoxy}-1,2,3,4-tetrahydro-2,7-naphthyridine-2-carboxylate, and

*tert*-butyl 2-methyl-5-[4-methyl-5-({5H,6H,7H,8H-pyrido[3,4-c]pyridazin-3-yloxy}methyl)-1H-1,2,3-triazol-1-yl]pyridine-2-carboxylate.