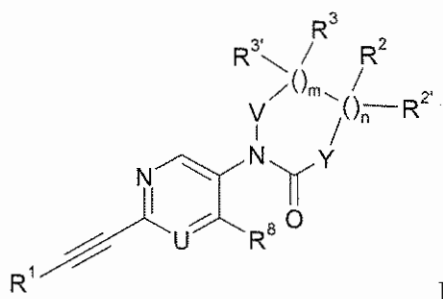


Claims

1. Ethynyl derivatives of formula I

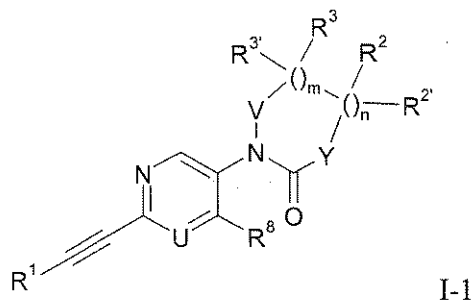


- 5 wherein
- U is N or CH,
- R⁸ is hydrogen, halogen, ~~lower C₁₋₄-alkyl~~ or ~~lower C₁₋₄-alkoxy~~;
- Y is -N(R⁴)-, -O- or -C(R⁵R^{5'})-;
- wherein R⁴ is hydrogen or ~~lower C₁₋₄-alkyl~~ and R⁵/R^{5'} are independently hydrogen,
- 10 hydroxy, ~~lower C₁₋₄-alkyl~~ or ~~lower C₁₋₄-alkoxy~~;
- V is -N(R⁶)- or -C(R⁷R^{7'}),
- wherein R⁶ is hydrogen or ~~lower C₁₋₄-alkyl~~ and R⁷/R^{7'} are independently from each other
- hydrogen, ~~lower C₁₋₄-alkyl~~, CH₂-~~lower C₁₋₄-alkoxy~~ or may form together with the carbon
- atom to which they are attached a C₃-C₆-cycloalkyl;
- 15 R¹ is phenyl or heteroaryl, which are optionally substituted by halogen, ~~lower C₁₋₄-alkyl~~ or
- ~~lower C₁₋₄-alkoxy~~;
- m is 0 or 1; in case m is 1,
- R³/R^{3'} are independently from each other hydrogen, ~~lower C₁₋₄-alkyl~~, CH₂-~~lower C₁₋₄-alkoxy~~ or
- may form together with the carbon atom to which they are attached a C₃-C₆-cycloalkyl;
- 20 n is 0 or 1; in case n is 1,
- R²/R^{2'} are independently from each other hydrogen, ~~lower C₁₋₄-alkyl~~, CH₂-~~lower C₁₋₄-alkoxy~~ or
- may form together with the carbon atom to which they are attached a C₃-C₆-cycloalkyl;
- or if m is 1 and n is 0, R³ and R⁷ may form together with the carbon atoms to which they are
- attached a C₄₋₆-cycloalkyl;
- 25 or if m is 1 and n is 1, R² and R³ or R³ and R⁷ may form together with the carbon atoms to
- which they are attached a C₄₋₆-cycloalkyl;

or to a pharmaceutically acceptable acid addition salt, to a racemic mixture, or to its corresponding enantiomer and/or optical isomer and/or stereoisomer thereof.

2. Ethynyl derivatives of formula I-1 according to claim 1

5



wherein

U is N or CH;

R⁸ is hydrogen;

10 Y is CH₂, O, -N(CH₃)- or -N(CH₂CH₃)-;

V is CH₂, -NH- or -N(CH₃)-;

R¹ is phenyl or pyridinyl, which are optionally substituted by halogen;

m is 0 or 1; in case m is 1,

15 R³/R³' are independently from each other hydrogen or lower C₁-₄-alkyl,

n is 1;

R²/R²' are independently from each other hydrogen or lower C₁-₄-alkyl;

or a pharmaceutically acceptable acid addition salt, a racemic mixture, or its corresponding enantiomer and/or optical isomer and/or stereoisomer thereof.

20 3. Ethynyl derivatives of formula I-1 according to claims 1 or 2, which compounds are

4,4-Dimethyl-1-(6-phenylethynyl-pyridin-3-yl)-pyrrolidin-2-one

6,6-Dimethyl-3-(6-phenylethynyl-pyridin-3-yl)-[1,3]oxazinan-2-one

3,4,4-Trimethyl-1-(6-phenylethynyl-pyridin-3-yl)-imidazolidin-2-one

1-[6-(4-Fluoro-phenylethynyl)-pyridin-3-yl]-3,4,4-trimethyl-imidazolidin-2-one

25 1-[6-(3-Fluoro-phenylethynyl)-pyridin-3-yl]-3,4,4-trimethyl-imidazolidin-2-one

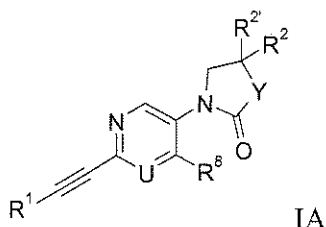
3,4,4-Trimethyl-1-(6-pyridin-3-ylethynyl-pyridin-3-yl)-imidazolidin-2-one

1-[6-(3-Fluoro-phenylethynyl)-pyridin-3-yl]-4,4-dimethyl-pyrrolidin-2-one

5,5-Dimethyl-2-(6-phenylethynyl-pyridin-3-yl)-pyrazolidin-3-one

4,4-Dimethyl-1-(6-phenylethynyl-pyrimidin-3-yl)-pyrrolidin-2-one
 3,4,4-Trimethyl-1-(2-phenylethynyl-pyrimidin-5-yl)-imidazolidin-2-one
 3-Ethyl-4,4-dimethyl-1-(2-phenylethynyl-pyrimidin-5-yl)-imidazolidin-2-one
 1,5,5-Trimethyl-2-(6-phenylethynyl-pyridin-3-yl)-pyrazolidin-3-one
 5 2-[6-(3-Fluoro-phenylethynyl)-pyridin-3-yl]-1,5,5-trimethyl-pyrazolidin-3-one
 2-[6-(2,5-Difluoro-phenylethynyl)-pyridin-3-yl]-1,5,5-trimethyl-pyrazolidin-3-one
 2-[6-(3-Fluoro-phenylethynyl)-pyridin-3-yl]-5,5-dimethyl-pyrazolidin-3-one or
 2-[6-(2,5-Difluoro-phenylethynyl)-pyridin-3-yl]-5,5-dimethyl-pyrazolidin-3-one.

10 4. Ethynyl derivatives of formula IA according to claim 1,



wherein

U is N or CH,

R⁸ is hydrogen, halogen, lower C₁₋₄-alkyl or lower C₁₋₄-alkoxy;

15 Y is -N(R⁴)-, O or -C(R⁵R⁵)-;

wherein R⁴ is hydrogen or lower C₁₋₄-alkyl and R⁵/R⁵ are independently hydrogen, hydroxy, lower C₁₋₄-alkyl or lower C₁₋₄-alkoxy;

R¹ is phenyl or heteroaryl, which are optionally substituted by halogen, lower C₁₋₄-alkyl or lower C₁₋₄-alkoxy;

20 R²/R² are independently from each other hydrogen, lower C₁₋₄-alkyl, CH₂-lower C₁₋₄-alkoxy or may form together with the carbon atom to which they are attached a C₃-C₆-cycloalkyl; or a pharmaceutically acceptable acid addition salt, a racemic mixture, or its corresponding enantiomer and/or optical isomer and/or stereoisomer thereof.

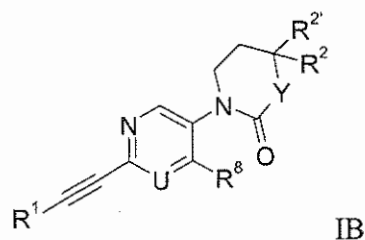
25 5. Ethynyl derivatives of formula IA according to claims 1 or 4, which compounds are:

4,4-dimethyl-1-(6-phenylethynyl-pyridin-3-yl)-pyrrolidin-2-one
 3,4,4-trimethyl-1-(6-phenylethynyl-pyridin-3-yl)-imidazolidin-2-one
 1-[6-(4-fluoro-phenylethynyl)-pyridin-3-yl]-3,4,4-trimethyl-imidazolidin-2-one
 1-[6-(3-fluoro-phenylethynyl)-pyridin-3-yl]-3,4,4-trimethyl-imidazolidin-2-one
 30 3,4,4-trimethyl-1-(6-pyridin-3-ylethynyl-pyridin-3-yl)-imidazolidin-2-one

1-[6-(3-fluoro-phenylethynyl)-pyridin-3-yl]-4,4-dimethyl-pyrrolidin-2-one
4,4-dimethyl-1-(6-phenylethynyl-pyrimidin-3-yl)-pyrrolidin-2-one
3,4,4-Trimethyl-1-(2-phenylethynyl-pyrimidin-5-yl)-imidazolidin-2-one or
3-Ethyl-4,4-dimethyl-1-(2-phenylethynyl-pyrimidin-5-yl)-imidazolidin-2-one.

5

6. Ethynyl derivatives of formula according to claim 1,



wherein

U is N or CH,

10 | R⁸ is hydrogen, halogen, ~~C₁₋₄-lower alkyl~~ or ~~C₁₋₄-lower alkoxy~~;

Y is -N(R⁴)-, O or -C(R⁵R^{5'})-;

wherein R⁴ is hydrogen or ~~C₁₋₄-lower alkyl~~ and R⁵/R^{5'} are independently hydrogen, hydroxy, ~~C₁₋₄-lower alkyl~~ or ~~C₁₋₄-lower alkoxy~~;

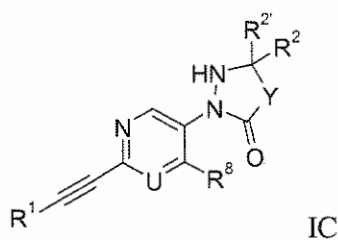
15 | R¹ is phenyl or heteroaryl, which are optionally substituted by halogen, ~~C₁₋₄-lower alkyl~~ or ~~C₁₋₄-lower alkoxy~~;

R²/R^{2'} are independently from each other hydrogen, ~~C₁₋₄-lower alkyl~~, CH₂-~~C₁₋₄-lower alkoxy~~ or may form together with the carbon atom to which they are attached a C₃-C₆-cycloalkyl; or a pharmaceutically acceptable acid addition salt, a racemic mixture, or its corresponding enantiomer and/or optical isomer and/or stereoisomer thereof.

20

7. Ethynyl derivatives of formula IB according to claims 1 and 6, which compound is 6,6-dimethyl-3-(6-phenylethynyl-pyridin-3-yl)-[1,3]oxazinan-2-one.

8. Ethynyl derivatives of formula IC according to claim 1,



25

wherein

U is N or CH,

R⁸ is hydrogen, halogen, ~~C₁₋₄-lower-alkyl~~ or ~~C₁₋₄-lower-alkoxy~~;

Y is -N(R⁴)-, O or -C(R⁵R^{5'})-;

wherein R⁴ is hydrogen or ~~C₁₋₄-lower-alkyl~~ and R⁵/R^{5'} are independently hydrogen, hydroxy, ~~C₁₋₄-lower-alkyl~~ or ~~C₁₋₄-lower-alkoxy~~;

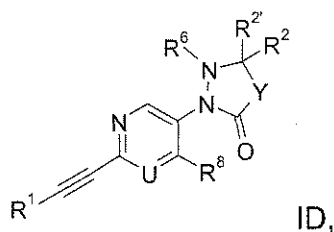
R¹ is phenyl or heteroaryl, which are optionally substituted by halogen, ~~C₁₋₄-lower-alkyl~~ or ~~C₁₋₄-lower-alkoxy~~;

R²/R^{2'} are independently from each other hydrogen, ~~C₁₋₄-lower-alkyl~~, CH₂-~~C₁₋₄-lower-alkoxy~~ or may form together with the carbon atom to which they are attached a C₃-C₆-cycloalkyl;

or a pharmaceutically acceptable acid addition salt, a racemic mixture, or its corresponding enantiomer and/or optical isomer and/or stereoisomer thereof.

9. Ethynyl derivatives of formula IC according to claims 1 and 8, which compound is 5,5-dimethyl-2-(6-phenylethynyl-pyridin-3-yl)-pyrazolidin-3-one.

10. Ethynyl derivatives of formula ID according to claim 1,



wherein

U is N or CH,

R⁸ is hydrogen, halogen, ~~C₁₋₄-lower-alkyl~~ or ~~C₁₋₄-lower-alkoxy~~;

Y is -N(R⁴)-, -O- or -C(R⁵R^{5'})-;

wherein R⁴ is hydrogen or ~~C₁₋₄-lower-alkyl~~ and R⁵/R^{5'} are independently hydrogen, hydroxy, ~~C₁₋₄-lower-alkyl~~ or ~~C₁₋₄-lower-alkoxy~~;

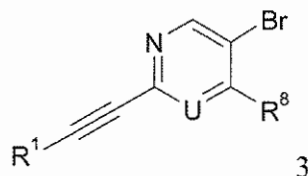
R⁶ is hydrogen or ~~C₁₋₄-lower-alkyl~~

R¹ is phenyl or heteroaryl, which are optionally substituted by halogen, ~~C₁₋₄-lower-alkyl~~ or ~~C₁₋₄-lower-alkoxy~~;

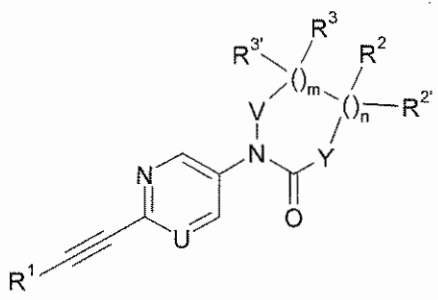
R²/R^{2'} are independently from each other hydrogen, ~~C₁₋₄-lower-alkyl~~, CH₂-~~C₁₋₄-lower-alkoxy~~ or may form together with the carbon atom to which they are attached a C₃-C₆-cycloalkyl;

or a pharmaceutically acceptable acid addition salt, a racemic mixture, or its corresponding enantiomer and/or optical isomer and/or stereoisomer thereof.

with a suitable compound of formula



to a compound of formula



- 5 wherein the substituents are described in claim 1, and,
if desired, converting the compounds obtained into pharmaceutically acceptable acid addition salts.

13. A compound according to any one of claims 1 to 11 for use as therapeutically active substance.

- 10 14. A pharmaceutical composition comprising at least one of the compounds according to any one of claims 1 to 11 as well as its pharmaceutically acceptable salt.

15. A compound of any one of claims 1 –11, when applicable as mixtures of enantiomers, diastereomers, or in enantiomerically pure form; as well as its pharmaceutically acceptable salt, for use as a medicament.

- 15 16. The use of a compound according to any one of claims 1 to 11 as well as its pharmaceutically acceptable salt for the manufacture of a medicament for the treatment or prevention of ~~diseases relating to allosteric modulators of mGluR⁵ receptors~~ schizophrenia, cognitive diseases, fragile X syndrome or autism.

- 20 17. The use of a compound according to claim 16 for the treatment or prevention of schizophrenia, cognitive diseases, fragile X syndrome or autism.

18. A compound according to any one of claims 1 to 11 for use in the treatment or prevention of schizophrenia, cognitive diseases, fragile X syndrome or autism.

~~19. A method for the treatment of schizophrenia, cognitive diseases, fragile X syndrome or autism, which method comprises administering an effective amount of a compound as defined in any one of claims 1 to 11.~~

~~20. The invention as hereinbefore described.~~