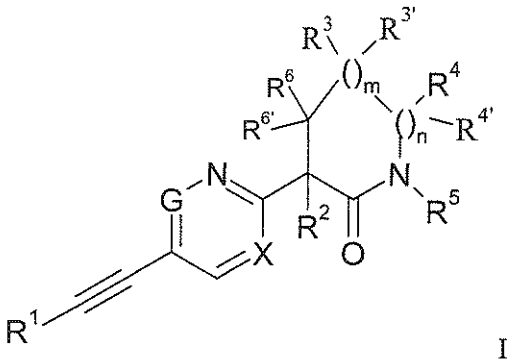
Positive allosteric modulators are compounds that do not directly activate receptors by themselves, but markedly potentiate agonist-stimulated responses, increase potency and maximum of efficacy. The binding of these compounds increase the affinity of a glutamate-site agonist at its extracellular N-terminal binding site. Positive allosteric modulation is thus an attractive mechanism for enhancing appropriate physiological receptor activation. There is a scarcity of selective positive allosteric modulators for the mGluR5 receptor. Conventional mGluR5 receptor modulators typically lack satisfactory aqueous solubility and exhibit poor oral bioavailability. Therefore, there remains a need for compounds that overcome these deficiencies and that effectively provide selective positive allosteric modulators for the mGluR5 receptor.

Compounds of formula I are distinguished by having valuable therapeutic properties. They can be used in the treatment or prevention of disorders, relating to positive allosteric modulators for the mGluR5 receptor.

The most preferred indications for compounds which are positive allosteric modulators are schizophrenia and cognition.

The present disclosure~~invention~~ relates to compounds of formula I and to their pharmaceutically acceptable salts, to these compounds as pharmaceutically active substances, to the processes for their production as well as to the use in the treatment or prevention of disorders, relating to positive allosteric modulators for the mGluR5 receptor, such as schizophrenia, tuberous sclerosis, and cognition and to pharmaceutical compositions containing the compounds of formula I..

In a first aspect, there is provided a compound of formula



I

wherein

X is N or C-R, wherein R is hydrogen or halogen;

G is N or CH;

with the proviso that maximum one of G or X can be nitrogen;

R^1 is phenyl or pyridinyl, which are optionally substituted by halogen;

R^2 is hydrogen, lower alkyl, hydroxy, lower alkoxy or C(O)O-benzyl;

R^3,$R^{3'}$, R^4, $R^{4'}$, R^6, $R^{6'}$ are independently from each other hydrogen or lower alkyl;

or R^6 and R^4 may form together with the carbon atom to which they are attached a C_{4-6}-cycloalkyl ring, if m is 0 and n is 1 or 2;

R^5 is hydrogen or lower alkyl;

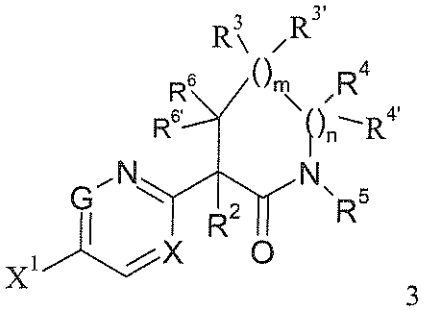
n is 0, 1 or 2;

m is 0 or 1; with the proviso that n and m are not simultaneously 0;

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

In a second aspect, there is provided a process for preparation of a compound of formula I as described above, comprising the variants

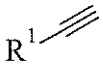
a) reacting a compound of formula



3

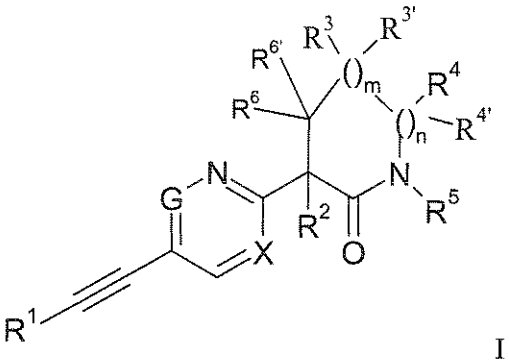
wherein X^1 is halogen

with a compound of formula



4

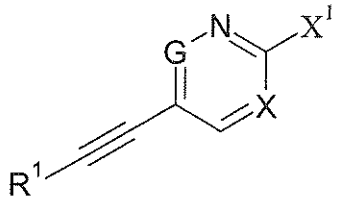
to a compound of formula



I

wherein the definitions are as described above or

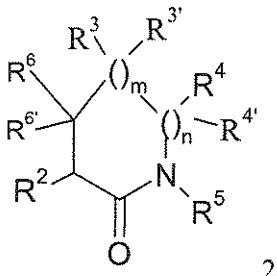
b) reacting a compound of formula



5

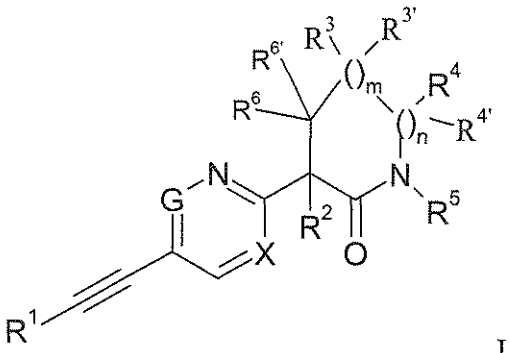
wherein X^1 is halogen

with a compound of formula



2

to form a compound of formula



I

wherein the definitions are as described above, or, if desired, converting the compounds obtained into pharmaceutically acceptable acid addition salts.

In a third aspect, there is provided a compound as defined above, whenever prepared by a process as defined above.

In a fourth aspect, there is provided a compound as defined above for use as therapeutically active substance.

In a fifth aspect, there is provided a pharmaceutical composition comprising a compound as defined above and a therapeutically active carrier.

In a sixth aspect, there is provided the use of a compound as defined above for the manufacture of a medicament for the treatment of schizophrenia or cognitive diseases.

In a seventh aspect, there is provided a compound as defined above for the treatment of schizophrenia or cognitive diseases.

The following definitions of the general terms used in the present description apply irrespective of whether the terms in question appear alone or in combination.

As used herein, the term "lower alkyl" denotes a saturated, i.e. aliphatic hydrocarbon group including a straight or branched carbon chain with 1 – 4 carbon atoms. Examples for "alkyl" are methyl, ethyl, n-propyl, and isopropyl.

The term "alkoxy" denotes a group -O-R' wherein R' is lower alkyl as defined above.

The term "halogen" denotes fluoro, chloro, bromo or iodo.

The term "pharmaceutically acceptable salt" or "pharmaceutically acceptable acid addition salt" embraces salts with inorganic and organic acids, such as hydrochloric acid, nitric acid, sulfuric acid, phosphoric acid, citric acid, formic acid, fumaric acid, maleic acid, acetic acid, succinic acid, tartaric acid, methane-sulfonic acid, p-toluenesulfonic acid and the like.

One embodiment of the invention are compounds of formula IA

wherein the definitions are as described in claim 1, or, if desired, converting the compounds obtained into pharmaceutically acceptable acid addition salts.

13. A compound according to any one of claim 1 -11, whenever prepared by a process as claimed in claim 12.

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

15. A pharmaceutical composition comprising a compound in accordance with any one of claims 1 –11 and a therapeutically active carrier.

~~16. The use of a compound according to any one of claims 1 –11 for the treatment of schizophrenia or cognitive diseases.~~

~~17~~16. The use of a compound as claimed in any one of claims 1-11 for the manufacture of a medicament for the treatment of schizophrenia or cognitive diseases.

17~~18~~. A compound according to any one of claims 1 –11 for the treatment of schizophrenia or cognitive diseases.

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