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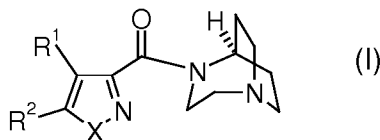
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(54) Title: (1,4-DIAZA-BICYCLO[3.2.2]NON-6-EN-4-YL)-HETEROCYCLYL-METHANONE LIGANDS FOR NICOTINIC ACETYLCHOLINE RECEPTORS, USEFUL FOR THE TREATMENT OF DISEASE



(I) wherein X, R1, and R2 are as herein defined.

(57) Abstract: The present invention relates generally to the field of ligands for nicotinic acetylcholine receptors (nACh receptors), activation of nACh receptors, and the treatment of disease conditions associated with defective or malfunctioning nicotinic acetylcholine receptors, especially of the brain. Further, this invention relates to novel compounds, which act as ligands for the $\alpha 7$ nACh receptor subtype, methods of preparing such compounds, compositions containing such compounds, and methods of use thereof. The novel compounds include compounds of formula I:

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2008/080743**A. CLASSIFICATION OF SUBJECT MATTER***C07D 453/00(2006.01)i, C07D 307/78(2006.01)i, A61K 31/4045(2006.01)i, A61K 31/439(2006.01)i*

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

IPC 8 as above

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

eKIPASS(KIPO internal), STN(REG, CAplus), PubMed, JPO, USPTO, Google

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X / A	WO 2004/033456 A2 (SANOFI-SYNTHELABO) 22 April 2004 See the abstract, page 17 line 20~37, claims 1, 10	1-4, 11-13, 19, 21, 39-44 partially, and 8-9, 17-18, 36-38 / 1-4, 11-13, 19, 21, 39-44 partially, and 5-7, 10, 14-16, 20, 22-35
X / A	WO 2005/111038 A2 (MEMORY PHARMACEUTICALS) 24 November 2005 See the abstract, page 3 line 17~page 19 line 25, claims 1, 42~64	1-4, 11-13, 19, 21, 39-44 partially, and 8-9, 17-18, 36-38 / 1-4, 11-13, 19, 21, 39-44 partially, and 5-7, 10, 14-16, 20, 22-35
X / A	WO 2007/056582 A1 (MEMORY PHARMACEUTICALS) 18 May 2007 See the abstract, page 2 line 19~page 19 line 5, claims 1, 21~43	1-4, 11-13, 19, 21, 39-44 partially, and 8-9, 17-18, 36-38 / 1-4, 11-13, 19, 21, 39-44 partially, and 5-7, 10, 14-16, 20, 22-35



Further documents are listed in the continuation of Box C.



See patent family annex.

* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent but published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2008/080743

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☒ Claims Nos.: 45-59
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 45-59 pertain to methods for treatment of the human or animal body by therapy, as well as diagnostic methods, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.
2. ☐ Claims Nos.:
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying an additional fee, this Authority did not invite payment of any additional fee.
3. ☐ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.:
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2008/080743

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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