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HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP,  
KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD,  
ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI,  
NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD,  
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Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments (Rule 48.2(h))

(88) Date of publication of the international search report:

20 October 2011

(54) Title: MULTICYCLIC COMPOUNDS AND METHODS OF USE THEREOF

(57) Abstract: Provided herein are multicyclic compounds, methods of their synthesis, pharmaceutical compositions comprising the compounds, and methods of their use. The compounds provided herein are useful for the treatment, prevention, and/or management of various neurological disorders, including but not limited to, psychosis and schizophrenia.



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## INTERNATIONAL SEARCH REPORT

International application No.  
**PCT/US2010/058884****A. CLASSIFICATION OF SUBJECT MATTER***C07D 495/04(2006.01)i, C07D 495/20(2006.01)i, C07D 333/56(2006.01)i, A61K 31/381(2006.01)i, A61P 25/18(2006.01)i, A61P 25/00(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)

C07D 495/04; C07D 491/02; C07D 333/50; C07D 409/04; A61K 31/381; A61K 31/546

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)

CAPLUS, eKOMPASS(KIPO internal)

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6262044 B1 (N. P. H. MOLLER et al.) 17 July 2001 See examples 50-51, abstract.	1-3,5-56
A	US 2008-0081910 A1 (A. L. SABB et al.) 03 April 2008 See paragraph 221.	1-3,5-56
A	US 7019026 B1 (H. S. ANDERSEN et al.) 28 March 2006 See the entire document.	1-3,5-56

 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

"&amp;" document member of the same patent family

Date of the actual completion of the international search

24 AUGUST 2011 (24.08.2011)

Date of mailing of the international search report

**25 AUGUST 2011 (25.08.2011)**

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2010/058884

**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.: 59-62  
because they relate to subject matter not required to be searched by this Authority, namely:  
Claims 59-62 pertain to a method for treatment of the human by therapy, 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.: 58, 60  
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:  
Claims 58, 60 refer to claims which are not searchable due to not being drafted in accordance with the third sentence of Rule 6.4(a).
3.  Claims Nos.: 4, 57, 59, 61-62  
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/US2010/058884**

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6262044 B1	17.07.2001	AU 1999-27135 A1	27.09.1999
		AU 1999-27136 A1	27.09.1999
		AU 1999-27137 A1	27.09.1999
		AU 1999-27139 A1	27.09.1999
		AU 1999-28258 A1	27.09.1999
		CA 2323472 A1	16.09.1999
		CA 2323493 A1	16.09.1999
		CN 1300279 A0	20.06.2001
		CN 1300291 A0	20.06.2001
		EP 1062199 A1	27.12.2000
		EP 1062204 A1	27.12.2000
		EP 1062218 A1	27.12.2000
		EP 1080068 A1	07.03.2001
		EP 1080095 A1	07.03.2001
		EP 1080095 B1	02.11.2005
		JP 2002-506055 A	26.02.2002
		JP 2002-506058 A	26.02.2002
		JP 2002-506072 A	26.02.2002
		JP 2002-506073 A	26.02.2002
		JP 2004-500308 A	08.01.2004
		KR 10-2001-0041811 A	25.05.2001
		KR 10-2001-0041814 A	25.05.2001
		US 2002-0002199 A1	03.01.2002
		US 2002-0019412 A1	14.02.2002
		US 2002-0165398 A1	07.11.2002
		US 2003-0069267 A1	10.04.2003
		US 2005-0119332 A1	02.06.2005
		US 6225329 B1	01.05.2001
		US 6410586 B1	25.06.2002
		US 6951878 B2	04.10.2005
		WO 99-46236 A1	16.09.1999
		WO 99-46237 A1	16.09.1999
		WO 99-46244 A1	16.09.1999
WO 99-46267 A1	16.09.1999		
WO 99-46268 A1	16.09.1999		
US 2008-0081910 A1	03.04.2008	US 2006-0205759 A1	14.09.2006
		US 7297704 B2	20.11.2007
US 7019026 B1	28.03.2006	AT 309250 T	15.11.2005
		AU 2000-69853 A1	17.04.2001
		AU 6985300 A	17.04.2001
		DE 60023923 D1	15.12.2005
		EP 1214325 A1	19.06.2002
		EP 1214325 B1	09.11.2005
		JP 2003-509430 A	11.03.2003
WO 01-19831 A1	22.03.2001		