Title: CHEMICAL INDUCERS OF NEUROGENESIS

Abstract: The present invention relates to compounds and methods for inducing neuronal differentiation in normal neural stem cells and brain cancer stem cells. The methods may take place in vitro, such as in isolates from the adult mammalian brain, or in vivo. Compounds and methods described herein may find use in the treatment of neurodegenerative and psychiatric diseases, the repair and regeneration of the nervous system, and in treatment of neurologic malignancy.
**INTERNATIONAL SEARCH REPORT**

International application No
PCT/US2007/081304

**A. CLASSIFICATION OF SUBJECT MATTER**

INV. CD7D231/12 CD7D261/08 CD7D403/04 CD7D405/04 CD7D409/04
C07D413/04 C07D413/14 C07D417/04 A61K31/415 A61K31/421
A61K31/422 A61K31/426 A61P25/00 A61P35/00

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 A61K A61P

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 practical, search terms used)
EPO-Internal, WPI Data, CHEM ABS Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

<table>
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<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
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<tr>
<td>X</td>
<td>LEOPOLDO MARCELLO ET AL: &quot;Design, synthesis, and binding affinities of potential positron emission tomography (PET) ligands for visualization of brain dopamine D-3 receptors&quot; JOURNAL OF MEDICINAL CHEMISTRY, AMERICAN CHEMICAL SOCIETY. WASHINGTON, vol. 49, no. 1, 1 January 2006 (2006-01-01), pages 358-365, XP002465112 ISSN: 0022-2623 pages 358, 360; compounds 24, 35</td>
<td>1-13, 39-44</td>
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<td>X</td>
<td>EP 0 418 667 A (BASF AG [DE]) 27 March 1991 (1991-03-27) pages 6, 73; examples 1, 2</td>
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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
  B* earlier document but published on or after the International filing date
  C* document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
  D* document referring to an oral disclosure, use, exhibition or other means
  E* 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
  Z* document member of the same patent family

Date of the actual completion of the international search: 26 June 2008

Date of mailing of the international search report: 07/10/2008

Name and mailing address of the ISA:
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk, Tel. (+31-70) 340-2040, Tx 31 651 epo nl. Fax: (+31-70) 340-3016

Authorized officer: Bourghida, E

Form PCT/ISA/210 (second sheet) (April 2005)
<table>
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<td>X</td>
<td>WO 03/013517 A (PHARMACIA ITALIA SPA [IT]; CAVICCHIOLI MARCELLO [FR]; PEVARELLO PAOLO) 20 February 2003 (2003-02-20) pages 2,54; example 3</td>
<td>1-13, 39-44</td>
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INTERNATIONAL SEARCH REPORT

Box No. II Observations where certain claims were found uns searchable (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.:
   because they relate to subject matter not required to be searched by this Authority, namely:
   Although claims 39-44 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.

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:

see additional sheet

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 fees, this Authority did not invite payment of additional fees.

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.:

see annex

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.
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-13 (fully), 39-44 (partially)

   Compounds of the general formula (I) and their pharmaceutical uses.

2. claims: 14-27 (fully), 39-44 (partially)

   Method of inducing neuronal differentiation in a stem cell comprising contacting said stem cell with a compound of formula (II).

3. claims: 28-38 (fully), 39-44 (partially)

   Method of inducing neuronal differentiation in a stem cell comprising contacting said stem cell with a compound of formula (V).
### INTERNATIONAL SEARCH REPORT

**International application No.**

PCT/US2007/081304

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Form: PCT/ISA/10 (patent family annex) (April 2005)