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Published:

- with international search report (Art. 21(3))
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(54) Title: SMALL MOLECULES SUPPORTING PLURIPOTENT CELL GROWTH AND METHODS THEREOF

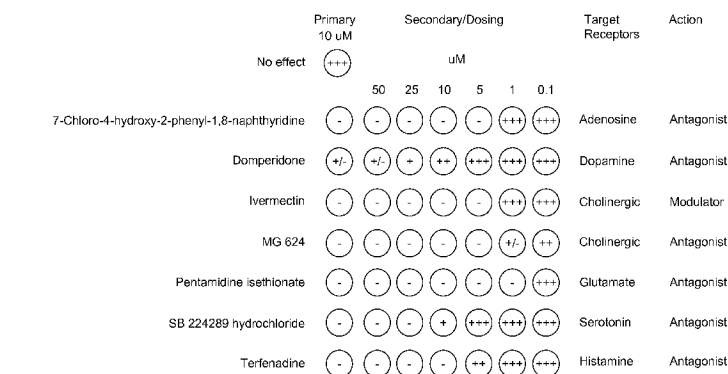


Figure 1

(57) Abstract: The present invention relates to compositions and methods for maintaining undifferentiated pluripotent stem cell cultures.

A. CLASSIFICATION OF SUBJECT MATTER*C12N 5/0735(2010.01)i, C12N 5/02(2006.01)i, A61K 31/435(2006.01)i, A61K 31/137(2006.01)i, C07K 14/475(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)

C12N 5/0735; A61K 33/00

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & PubMed

Keywords: neurotransmitter, stem cell, expansion, proliferation

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	Eur. J. Neurosci., 2000, Vol. 12, pp.1227-1240. See abstract and figures 5-7	6,9,13,15-24,47,50 ,54,56-65,88,91,95 ,97-106
X	Stem Cells, 2006, Vol. 24, pp.2637-2648. See abstract and figures 2,3	6,10,14,47,51,55 ,88,92,96
Y		11,52,93
Y	Nature, 24 Jan. 2008, Vol. 451, pp.460-465. See abstract and figures	11,52,93
A	WO 2007-148332 A1 (YEDA RESEARCH AND DEVELOPMENT CO. LTD et al.) 27 December 2007 See abstract, claims and Fig. 7	3,5-8,13-26,29-41 ,44,46-49,54-67 ,70-82,85,87-108 ,111-123
A	Cell, 2006, Vol. 124, pp.407-421. See abstract and figures	3,5-8,13-26,29-41 ,44,46,47-79,54-67 ,70-82,85,87-90 ,95-108,111-123



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 REPORTInternational application No.
PCT/US2010/032601**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.:
because they relate to subject matter not required to be searched by this Authority, namely:

2. ☒ Claims Nos.: 1,2,4,12,27,28,42,43,45,53,68,69,83,84,86,94,109,110
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:
See extra sheet

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 extra 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 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.

For Unsearchable Claims: Clarity and inadequate support by the description

No international search report has been established for claims 1, 2, 4, 12, 27, 28, 42, 43, 45, 53, 68, 69, 83, 84, 86, 94, 109 and 110.

Claims 1, 2, 42, 43, 83 and 84 are unclear; the technical feature of "a compound selected from the group consisting of an agonist, an antagonist, a ligand, and a modulator of neurotransmitter receptor" is too broad to make meaningful search and opinion with regard to novelty and inventive step.

Furthermore, a detailed description of the present invention provides the effect of a modulator only for agonists of adrenergic, cholinergic, dopaminergic and adenosine receptor.

Thus, claims 4, 12, 27, 28, 45, 53, 68, 69, 86, 94, 109 and 110 are inadequately supported by the description.

For Unity of Invention

This invention relates to a small molecule which supports expansion and self-renewal of undifferentiated pluripotent stem cell. There are at least 7 different classes of neurotransmitter receptors which are involved as effective small molecules in this application. Small molecules of the present invention are compounds regulating neurotransmitter receptors such as adrenergic, dopaminergic, cholinergic, histaminergic, glutaminergic, serotonergic or adenosine receptor.

However, expansion of stem cells through activation of neurotransmitter receptor is already known in the arts (e.g., Eur. J. Neurosci., 2000, Vol. 12, pp.1227-1240). Therefore, usages of compounds which modulate the activities on 7 different classes of neurotransmitter are not linked to form a single general inventive concept.

That is, 7 groups of inventions do not relate to a single general inventive concept under PCT Rule 13.1, because under PCT Rule 13.2, they lack the same or corresponding special technical features: they are separate groups of invention with distinct fields of search.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2010/032601Patent document
cited in search reportPublication
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date

WO 2007-148332 A1

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