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(54) Title: CANCER STEM CELLS AND METHODS OF USING THE SAME

(57) Abstract: Provided are methods of culturing cancer stem cells in vitro, where the cancer stem cells have been obtained from the peripheral blood of a patient, and methods of using the cultured cancer stem cells in a xenograft model of cancer and for in vivo and in vitro screening of test compounds. Also provided is an enriched population of cancer stem cells obtained from the peripheral blood of a patient.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 13/30443

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC(8) - G01N 33/574; A61K 49/00; C12N 5/02; C12P 21/04 (2013.04)  
 USPC - 435/7.23, 424/9.2; 435/325; 435/70.4  
 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) - G01N 33/574; A61K 49/00; C12N 5/02; C12P 21/04 (2013.04)  
 USPC - 435/7.23, 424/9.2; 435/325; 435/70.4

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)  
 WEST; Google Scholar; PatBase  
 search terms - Tumor, tumor\$, cancer, cancer\$, stem, progenitor, initiating, pluripot\$, cell, cells, enrich\$, isolat\$, cultur\$, passag\$, maintai\$, PBMC, peripheral, blood, mononuclear, animal, mouse, model, candidat\$, screen, screen\$, circulating, injec\$, immunodeficient

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X — Y	US 2007/0134794 A1 (MANGANO J.) 14 June 2007 (14.06.2007) para [0006]; [0008]; [0027]; [0028]; [0036]; [0037]; [0040]; [0051]; [0061]; [0084]; [0104]; [0106]; [0120]-[0122]; [0132].	12, 33 ----- 1-5, 13-16, 22-28, 34-37
Y	US 2011/0092378 A1 (CLARKE et al.) 21 April 2011 (21.04.2011) para [0010]-[0012]; [0021]; [0041]; [0059]; [0080]; [0081]; [0095]-[0097]; [0117]-[0120]; Figure 9; claim 23.	1-5, 13-16, 22-28, 34-37
A	US 2005/00008624 A1 (PELED et al.) 13 January 2005 (13.01.2005) entire document	1-5, 12-16, 22-28, 33-37

Further documents are listed in the continuation of Box C.

* Special categories of cited documents:	“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
“A” document defining the general state of the art which is not considered to be of particular relevance	“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
“E” earlier application or patent but published on or after the international filing date	“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
“L” 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)	“&” document member of the same patent family
“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	

Date of the actual completion of the international search 15 April 2013 (15.04.2013)	Date of mailing of the international search report <b>09 MAY 2013</b>
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Name and mailing address of the ISA/US Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-3201	Authorized officer: Lee W. Young  PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774
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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 13/30443

## 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.:  
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.: 6-11, 17-21, 29-32, 38-42  
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 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.:

### 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.