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(88) Date of publication of the international search report:
5 July 2007

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: MATERIALS AND METHODS FOR IMPROVED TISSUE ENGINEERING

(57) Abstract: The subject invention provides materials and methods for improved tissue engineering. Specifically, the current invention pertains to the identification of advantageous extracellular matrix material scaffold coatings that can be used as described herein to modulate cell seeding, attachment, culturing, proliferation, and/or differentiation to a target cell. In a further embodiment, the scaffolds of the subject invention are used to modulate stem cells. In specific embodiments, a basement membrane preparation or gelatin can be used to coat polycaprolactone (PCL) scaffolds used for seeding, attaching, culturing, proliferating, and/or differentiating cells.



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INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/010827

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A61L27/56 C12M3/00

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)
 A61L C12M

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, PAJ, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/087444 A (UNIV ASTON [GB]; COOMBES ALLAN GERALD ARTHUR [GB]; WILLIAMSON MATTHEW) 23 October 2003 (2003-10-23)	1, 3, 4, 7, 8, 10-17, 20-26, 28-31, 36, 37, 45, 46
Y	page 6, paragraphs 3,5 page 7, paragraphs 1,2 page 8, paragraphs 4,5 page 10, paragraph 5 - page 11, paragraph 1 page 15, paragraphs 1,2 page 17, paragraph 2 claims 1-23; figure 1 ----- -/--	2, 27

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 document 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 another 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.
- *Z* document member of the same patent family

Date of the actual completion of the international search 2 May 2007	Date of mailing of the international search report 21/05/2007
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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 Derrien, Anne-Cécile
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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/010827

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2005/031598 A1 (LEVENBERG SHULAMIT [US] ET AL) 10 February 2005 (2005-02-10) the whole document paragraph [0067] claims 1-70	2,27
X	US 2003/077311 A1 (VYAKARNAM MURTY N [US] ET AL) 24 April 2003 (2003-04-24) paragraphs [0008], [0027], [0030], [0041], [0050], [0053], [0059] paragraphs [0087], [0092] - [0095], [0100] example 12 claims 1-61	1,5-13, 18,19, 30-38, 44-46
X	US 5 487 897 A (POLSON ALAN M [US] ET AL) 30 January 1996 (1996-01-30) column 2, lines 14-27 column 6, lines 10-47 column 7, lines 7-25 column 8, line 64 - column 9, line 25 column 13, lines 30-38 column 15, lines 1-16 claims 1-39	20-24,26
X	WO 01/70293 A (UNIV NOTTINGHAM [GB]; NOTTINGHAM TRENT UNIVERSITY [GB]; COOMBES ALLAN) 27 September 2001 (2001-09-27) page 5, lines 14-25 page 7, lines 22-30 claims 1-15; figure 1; example 2	1,11-13
X	WILLIAMSON M R ET AL: "Gravity spinning of polycaprolactone fibres for applications in tissue engineering" BIOMATERIALS, ELSEVIER SCIENCE PUBLISHERS BV., BARKING, GB, vol. 25, no. 3, February 2004 (2004-02), pages 459-465, XP004469639 ISSN: 0142-9612 cited in the application the whole document	1,7,8, 11,30, 31,37,45
X	US 6 537 567 B1 (NIKLASON LAURA E [US] ET AL) 25 March 2003 (2003-03-25) column 3, line 34 - column 4, line 39 column 11, lines 30-33 column 12, lines 17-23 column 15, lines 50-60 column 20, lines 3-9 column 25, lines 10-21 column 29 claims 1-9	1,4-13, 30-46
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C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>TOLLON ET AL: "FABRICATION OF COATED POLYCAPROLACTONE SCAFFOLDS AND THEIR EFFECTS ON MURINE EMBRYONIC CELLS" MATER. RES. SOC. SYMP. PROC., vol. 873E, 2005, pages K9.14.1-K9.14.5, XP002431014</p> <p>the whole document</p>	<p>1-3,5, 7-9, 11-13, 20-22, 26-28, 30,31, 35-38, 44-46</p>
P,X	<p>TOLLON MICHEAL: "fabrication of coated biodegradable polymer scaffolds and their effects on murine embryonic stem cells" 2005, UNIVERSITY OF FLORIDA , XP002431323 cited in the application</p> <p>the whole document</p>	<p>1-46</p>
A	<p>LEVENBERG S ET AL: "Differentiation of human embryonic stem cells on three-dimensional polymer scaffolds" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, NATIONAL ACADEMY OF SCIENCE, WASHINGTON, DC, US, vol. 100, no. 22, 28 October 2003 (2003-10-28), pages 12741-12746, XP002980824 ISSN: 0027-8424 cited in the application</p> <p>the whole document</p>	<p>1-46</p>
A	<p>YOUNG A T: "MICROCELLULAR FOAMS VIA PHASE SEPARATION" JOURNAL OF VACUUM SCIENCE AND TECHNOLOGY: PART A, AVS /AIP, MELVILLE, NY, US, vol. 4, no. 3, PART II, 1 May 1986 (1986-05-01), pages 1128-1133, XP000005423 ISSN: 0734-2101</p> <p>the whole document</p>	<p>1-46</p>
A	<p>US 2004/005297 A1 (CONNELLY PATRICK R [US] ET AL) 8 January 2004 (2004-01-08)</p> <p>the whole document</p>	<p>1-46</p>

INTERNATIONAL SEARCH REPORT

International application No.
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Box 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:
Although claims 30,45,46 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 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.
- No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/010827

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