

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
27 December 2007 (27.12.2007)

PCT

(10) International Publication Number
WO 2007/149548 A3

(51) International Patent Classification:

A61K 35/28 (2006.01) C12N 5/00 (2006.01)
A61K 35/14 (2006.01) A61P 15/10 (2006.01)

(21) International Application Number:

PCT/US2007/014525

(22) International Filing Date: 22 June 2007 (22.06.2007)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/816,170 22 June 2006 (22.06.2006) US

(71) Applicant (for all designated States except US): **MEDIS-
TEM LABORATORIES, INC.** [US/US]; 2027 East
Cedar, Suite 102, Tempe, Arizona 85281 (US).

(72) Inventor; and

(75) Inventor/Applicant (for US only): **ICHIM, Thomas E.**
[CA/US]; 3950 Mahaila Avenue, Unit J 33, San Diego,
California 92122 (US).

(74) Agent: **HART, Daniel**; Knobbe Martens Olson & Bear
Llp, 2040 Main Street, 14th Floor, Irvine, California 92614
(US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,

AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH,
CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG,
ES, FI, GB, GD, GE, GH, GM, GT, 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, PG, PH, PL,
PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY,
TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA,
ZM, ZW.

(84) Designated States (unless otherwise indicated, for every
kind of regional protection available): ARIPO (BW, GH,
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, PL,
PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM,
GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report
— before the expiration of the time limit for amending the
claims and to be republished in the event of receipt of
amendments

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

24 December 2008

(54) Title: TREATMENT OF ERECTILE DYSFUNCTION BY STEM CELL THERAPY

(57) Abstract: Methods, cells and compositions of matter are provided for treatment of erectile dysfunction using stem cell therapy. In particular, various stem cells are modified or administered freshly isolated in order to induce smooth muscle regeneration, neural regeneration, and restoration of endothelial function. In some embodiments endogenous stem cells are mobilized or activated to achieve therapeutic benefit. In other embodiments compositions derived from stem cells are utilized for treatment of erectile dysfunction.



WO 2007/149548 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2007/014525

A. CLASSIFICATION OF SUBJECT MATTER
 INV. A61K35/28 A61K35/14 C12N5/00 A61P15/10

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)
 A61K C12N 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, BIOSIS, EMBASE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	BOCHINSKI DEREK ET AL: "The effect of neural embryonic stem cell therapy in a rat model of cavernosal nerve injury" BJU INTERNATIONAL, vol. 94, no. 6, October 2004 (2004-10), pages 904-909, XP002487666 ISSN: 1464-4096 the whole document	1-3,5, 7-81, 152,155, 157,160, 162
A	DENG W ET AL: "Gene and stem cell therapy for erectile dysfunction." INTERNATIONAL JOURNAL OF IMPOTENCE RESEARCH DEC 2005, vol. 17 Suppl 1, December 2005 (2005-12), pages S57-S63, XP002491539 ISSN: 0955-9930 the whole document	1-3,5, 7-81, 152,155, 157,160, 162

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	*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
E earlier document but published on or after the international filing date	*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
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)	*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.
O document referring to an oral disclosure, use, exhibition or other means	*Z* document member of the same patent family
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 8 August 2008	Date of mailing of the international search report 06/11/2008
--	--

Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2260 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Authorized officer Hars, Jesko
--	---------------------------------------

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box II.1

Although claims 1-154 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.

Continuation of Box II.1

Claims Nos.: -

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/014525

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:
see FURTHER INFORMATION sheet PCT/ISA/210
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 allsearchable 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 additional sheet

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 5 (entirely); 1-3,7-81,152,155,157,160,162 (partially)

A method of treating erectile dysfunction by inhibiting neuronal cell dysfunction using stem cells.

2. claims: 6 (entirely); 1-3,7-81,152,155,157,160,162 (partially)

A method of treating erectile dysfunction by inhibiting cavernosal fibrosis using stem cells.

3. claims: 4 (entirely); 1-3,7-81,152,155,157,160,162 (partially)

A method of treating erectile dysfunction by inhibiting smooth muscle degeneration using stem cells.

4. claims: 1-3,7-81,152,155,157,160,162 (partially)

A method of treating erectile dysfunction by inhibiting biological pathways causative of ischemia using stem cells.

5. claim: 14 (partially)

A method of treating erectile dysfunction by administering committed progenitor cells.

6. claim: 14 (partially)

A method of treating erectile dysfunction by administering differentiated cells.

7. claims: 82-91 (entirely)

A method of treating erectile dysfunction by administering a factor capable of inducing endogenous stem cell mobilisation.

8. claims: 92-151,158,159,163,164 (entirely)

A method of treating erectile dysfunction by administering products produced by stem cells.

9. claim: 153 (entirely)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A method of prophylactically treating coronary artery disease through intervening at the stage of erectile dysfunction onset.

10. claims: 156,161 (entirely)

Use of cord blood leukocytes in the treatment of erectile dysfunction.