



(51) International Patent Classification:

A61K 31/19 (2006.01) A61K 31/185 (2006.01)
A61K 31/192 (2006.01) A61P 21/00 (2006.01)

(21) International Application Number:

PCT/US2011/049905

(22) International Filing Date:

31 August 2011 (31.08.2011)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/378,996 1 September 2010 (01.09.2010) US

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

AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, 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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))

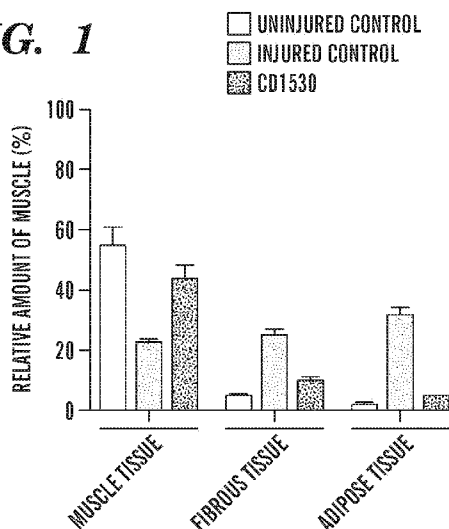
Published:

- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))

[Continued on next page]

(54) Title: COMPOSITION AND METHOD FOR MUSCLE REPAIR AND REGENERATION

FIG. 1



(57) Abstract: The invention provides methods for muscle repair or regeneration comprising administering therapeutically effective amounts of RAR agonists or stem cells that are pretreated with contact with a RAR agonist to a subject at a site of muscle damage. Additionally, the invention provides compositions comprising RAR agonist treated stem cells and methods of use of said cells for muscle repair or regeneration. In one embodiment, the stem cells are mesenchymal stem cells. In one embodiment, the RAR agonist is an RARY agonist. In one embodiment, administration of the RAR agonist is begun during a period of increased endogenous retinoid signaling in the subject resulting from incurrence of the damaged muscle tissue.

WO 2012/030919 A3

(88) Date of publication of the international search report:
5 July 2012

A. CLASSIFICATION OF SUBJECT MATTER*A61K 31/19(2006.01)i, A61K 31/192(2006.01)i, A61K 31/185(2006.01)i, A61P 21/00(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)

A61K 31/19; A61K 35/12; C12N 5/08; A61K 31/20

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) & Keywords: RAR, retinoic acid, myogenic, stem cell, differentiation

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2003-0113913 A1 (PURTON, L.E. et al.) 19 June 2003 See claims 14, 18, 34-38.	48-52
Y	See claims 14, 18.	38-42
Y	HALEVY, O. & LERMAN, O. Retinoic acid induces adult muscle cell differentiation mediated by the retinoic acid receptor- α . J. Cell. Physiol. 1993, Vol.154, No.3, pages 566-572 See page 568.	38-39
Y	SOPRANO, D.R. et al. Role of retinoic acid in the differentiation of embryonal carcinoma and embryonic stem cells. Vitam. Horm. 2007, vol.75, pages 69-95 See line 19 on page 75 - line 36 on page 78	40-42
A	US 2009-0214493 A1 (PITTINGER MARK F. et al.) 27 August 2009 See the whole document.	38-42, 48-52
A	US 2005-0271705 A1 (PATRICK HUGHES et al.) 08 December 2005 See the whole document.	38-42, 48-52

 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

30 APRIL 2012 (30.04.2012)

Date of mailing of the international search report

01 MAY 2012 (01.05.2012)

Name and mailing address of the ISA/KR

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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.: 1-15, 17-37
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 1-15, 17-37 pertain to a method for the treatment of the human body by therapy, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under PCT, to search.
2. Claims Nos.: 5-10, 60
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:
Claims 5-10, 60 are unsearchable because they are worded in reference to multiple dependent claim referring to any other multiple dependent claims..
3. Claims Nos.: 4, 11-18, 24, 26-37, 43-47, 53-59, 61-69
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 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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2011/049905

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2003-0113913 A1	19.06.2003	AU PR89-2501D0 CA 2409317 A1	13.12.2001 16.05.2003
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