

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 September 2007 (07.09.2007)

PCT

(10) International Publication Number
WO 2007/100722 A3

(51) International Patent Classification:

C12N 5/00 (2006.01) A01K 67/00 (2006.01)
C12N 15/00 (2006.01) A01K 67/027 (2006.01)

(21) International Application Number:

PCT/US2007/004835

(22) International Filing Date:

23 February 2007 (23.02.2007)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

60/777,654 28 February 2006 (28.02.2006) US

(71) Applicant (for all designated States except US):
TRUSTEES OF BOSTON UNIVERSITY [US/US];
One Sherborn Street, Boston, MA 02215 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WALSH, Kenneth**
[US/US]; 207 Judy Farm Road, Carlisle, MA 01741 (US).
OUCHI, Noriyuki [JP/US]; 44 Washington Street, Apt.
204, Brookline, MA 02445 (US). **IZUMIYA, Yasuhiro**
[JP/US]; 80 Pleasant Street, Apt. 25, Brookline, MA 02446
(US).

(74) Agents: **EISENSTEIN, Ronald, I.** et al.; Nixon Peabody
LLP, 100 Summer Street, Boston, MA 02110 (US).

(81) Designated States (unless otherwise indicated, for every
kind of national protection available): AE, AG, AL, AM,
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,
CO, CR, CU, CZ, DE, DK, DM, 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, LV, LY, MA, MD, 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, 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
— with sequence listing part of description published sepa-
rately in electronic form and available upon request from
the International Bureau

(88) Date of publication of the international search report:
18 December 2008

(54) Title: METHODS TO IDENTIFY FACTORS ASSOCIATED WITH MUSCLE GROWTH AND USES THEREOF

(57) Abstract: The present invention relates to methods to identify factors associated with muscle growth, angiogenesis, obesity, insulin sensitivity body weight, fat mass, muscle mass and cardiovascular function. In particular, the methods of the present invention relates to assays to identify such factors using a transgenic animal model and/or a cell-based assay.

WO 2007/100722 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US07/04835

A. CLASSIFICATION OF SUBJECT MATTER IPC: C12N 5/00(2006.01),15/00(2006.01);A01K 67/00(2006.01),67/027(2006.01) USPC: 435/320.1,325,375,455;800/8,14,18 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) U.S. : 435/320.1,325,375,455; 800/8,14,18 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched NONE Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) Please See Continuation Sheet		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	SHIOJIMA. I. Regulation of cardiac growth and coronary angiogenesis by the Akt/PKB signaling pathway. Genes Dev. December 2006, Vol.20, No 24, pages 3347-3365. see entire document.	1-46
A	SCHIEKOFER. S. et al. Microarray analysis of Akt1 activation in transgenic mouse hearts reveals transcript expression profiles associated with compensatory hypertrophy and failure. Physiol Genomics. October 2006, Vol 27, No 2, pages 156-170. see entire document.	1-46
X	SHIOJIMA. I. Disruption of coordinated cardiac hypertrophy and angiogenesis contributes to the transition to heart failure. J Clin Invest. August 2005, Vol 115, No 8, pages 2108-2118. see entire document.	1-2, 4-5, 8-11, 15-29, 31-35, 39-46
☒ 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 application or patent 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	"&" 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 28 August 2008 (28.08.2008)		Date of mailing of the international search report 26 SEP 2008
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 Sumesh Kaushal Telephone No. (571) 272-0547

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US07/04835

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CHO H et al. Insulin resistance and a diabetes mellitus-like syndrome in mice lacking the protein kinase Akt2 (PKB beta). Science. June 2001, Vol 292, No 5522, pages 1728-1731. see entire document.	29, 32, 35, 39-46

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US07/04835

Continuation of B. FIELDS SEARCHED Item 3:

STN: Medline, Caplus, Scisearch, Biosis, Mediconf. EAST: Uspat, Pgpup, Epo, Jpo, Derwent. SEARCH NOTES: muscle growth, angiogenesis, obesity, glucose regulation, muscle regeneration, muscle hypertrophy, Akt1, Akt2, Akt3, PI-3 Kinase, MCK promoter, inducible, skeletal, muscle promoter, transgenic, animal, mammal, mouse, RNAi, siRNA, miRNA, shRNA, antisense.