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(71) **Applicant:** CHARLES DREW UNIVERSITY OF MEDICINE AND SCIENCE [US/US]; 1731 East 120th Street, Los Angeles, CA 90059 (US).

(72) Inventor; and

(71) **Applicant** : SINGH, Rajan [US/—]; 2759 Westwood Boulevard, Los Angeles, CA 90064 (US).

(74) **Agents: DE VRY, Christopher** et al.; Arnold & Porter, LLP, 1801 Page Mill Road, Suite 110, Palo Alto, CA 94304-1216 (US).

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[Continued on next page]

(54) Title: COMPOSITIONS AND METHODS FOR TREATING OR PREVENTING METABOLIC SYNDROME DISORDERS

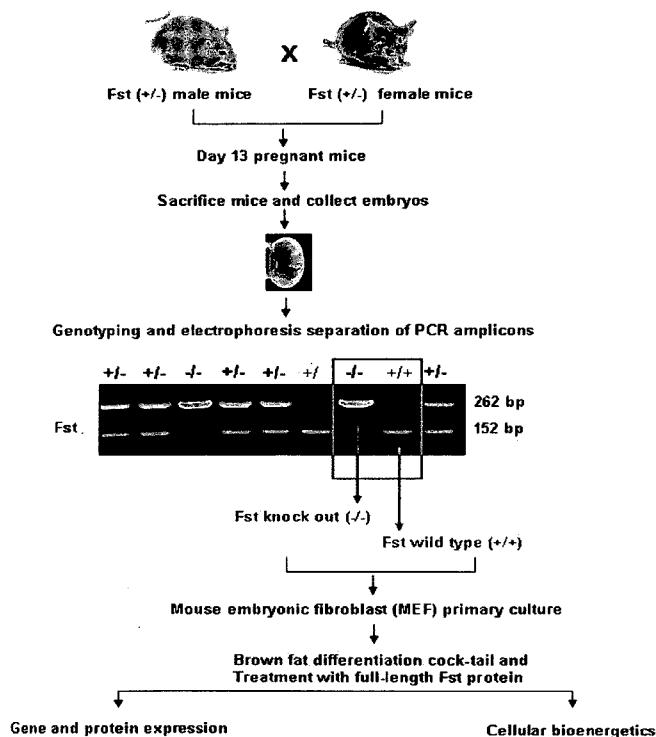


Figure 1

(57) Abstract: The invention provides methods, compositions, uses of compositions, assays and kits for modulating brown adipose tissue (BAT) in animals and patients with obesity, insulin resistance and perturbed glucose homeostasis are disclosed. Accordingly, methods, compositions, uses of compositions, and kits are useful for the amelioration of pathological conditions characterized by storage of excess energy, insulin resistance and related metabolic syndromes often associated with obesity.



MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK,
SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ,
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CORRECTED VERSION**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US 2013/034855

A. CLASSIFICATION OF SUBJECT MATTER																						
<i>G01N 33/68 (2006.01)</i> <i>A61K 31/00 (2006.01)</i> <i>A61P 3/00 (2006.01)</i> <i>A61P 9/12 (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)																						
G01N 33/00, 33/68, A61K 31/00, A61P 3/00, 9/12																						
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)																						
Esp@cenet, VINITI.RU, EAPO, PubMed, USPTO DB, PatSearch																						
C. DOCUMENTS CONSIDERED TO BE RELEVANT																						
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.																				
X	KATARZYNA SZKUDELSKA et al. Resveratrol, obesity and diabetes. European Journal of Pharmacology, 2010, Vol. 635, pp. 1-8	1, 4-5, 8-9, 11-13, 18, 21-23																				
Y		2-3, 6-7, 14-17, 19-20, 32-34, 36-37, 39-42																				
Y	JIN-TAEK HWANG et al. Genistein, EGCG, and capsaicin inhibit adipocyte differentiation process via activating AMP-activated protein kinase. Biochemical and Biophysical Research Communications, 2005, Vol. 338, p. 694-699	6-19																				
Y	BALACHANDAR VENKATESAN et al. Resveratrol inhibits PDGF receptor mitogenic signaling in mesangial cells: role of PTP1B. The FASEB J., 2008 October, Vol. 22, no. 10, p. 3469-3482, doi:10.1096/fj.08-1094488, pp. 1-15	7, 20																				
☒ Further documents are listed in the continuation of Box C. ☐ See patent family annex.																						
* Special categories of cited documents: <table border="0"> <tr> <td>"A"</td> <td>document defining the general state of the art which is not considered to be of particular relevance</td> <td>"T"</td> <td>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</td> </tr> <tr> <td>"E"</td> <td>earlier document but published on or after the international filing date</td> <td>"X"</td> <td>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</td> </tr> <tr> <td>"L"</td> <td>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)</td> <td>"Y"</td> <td>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</td> </tr> <tr> <td>"O"</td> <td>document referring to an oral disclosure, use, exhibition or other means</td> <td>"&"</td> <td>document member of the same patent family</td> </tr> <tr> <td>"P"</td> <td>document published prior to the international filing date but later than the priority date claimed</td> <td></td> <td></td> </tr> </table>			"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	"&"	document member of the same patent family	"P"	document published prior to the international filing date but later than the priority date claimed		
"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																			
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"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		Date of mailing of the international search report																				
24 July 2013 (24.07.2013)		08 August 2013 (08.08.2013)																				
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Facsimile No. +7 (499) 243-33-37		O. Skandari																				
		Telephone No. 8(495)531-65-15																				

CORRECTED VERSION

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 2013/034855

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2006/013602 A1 (SIGMA-TAU INDUSTRIE FARMACEUTICHE RIUNITE S.P.A.) 09.02.2006, abstract, paragraph [0063], claims	26-30
Y		32-34, 36-37
Y	JEONG GS et al. Butein from Rhus verniciflua protects pancreatic β cells against cytokine-induced toxicity mediated by inhibition of nitric oxide formation. Biol Pharm Bull, 2011, Vol. 34, no. 1, p. 97-102, (abstract), [retrieved on 12.07.2013]. Retrieved from the PubMed, PMID: 21212525	2-3, 14-17, 39-42
Y	PRASATH GS et al. Modulatory effects of fisetin, a bioflavonoid, on hyperglycemia by attenuating the key enzymes of carbohydrate metabolism in hepatic and renal tissues in streptozotocin-induced diabetic rats. Eur J Pharmacol, 2011 Oct 15, Vol. 668, no. 3, pp. 492-496, (abstract), [retrieved on 12.07.2013]. Retrieved from the PubMed, PMID: 21816145	2-3, 14-17, 39-42
X	BROWN ML et al. Follistatin and follistatin like-3 differentially regulate adiposity and glucose homeostasis. Obesity (Silver Spring), 2011 Oct, Vol. 19, no.10, p. 1940-1949, (abstract), [retrieved on 16.07.2013]. Retrieved from the PubMed, PMID: 21546932	10, 24, 31, 35, 38, 43-50

CORRECTED VERSION**INTERNATIONAL SEARCH REPORT**

International application No.

PCT/US 2013/034855

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.: 51-55
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: the subject matter of these claims is not clear.
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:

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.