Title: METHODS AND COMPOSITIONS COMPRISEING FAT5 FOR USE IN THE DIAGNOSIS AND TREATMENT OF METABOLIC DISORDERS

Abstract: The present invention provides methods for the identification of agents, e.g., therapeutic agents, that inhibit Fatty Acid Transport 5 (FAT5) activity, and methods of treating diseases or conditions associated with FAT5 function, e.g., obesity, insulin resistance, type 2 diabetes, dyslipidemia, fatty liver disease, and cardiovascular disease. Further aspects of the invention provide a transgenic FAT5 non-human knockout mammal, e.g., mouse, useful for elucidating the function of FAT5 in intact animals whose genomes comprise a wild-type FAT5 gene.
**INTERNATIONAL SEARCH REPORT**

### A. CLASSIFICATION OF SUBJECT MATTER

- IPC(7) : C12N 9/10; 15/09
- US CL : 435/183, 69.2

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.: 435/183, 69.2

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

### C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y</td>
<td>WO 99/36537 (WHITEHEAD INSTITUTE FOR BIOMEDICAL RESEARCH) 22 July 1999 (22.07.99), abstract, claims and the entire document.</td>
<td>1-4</td>
</tr>
</tbody>
</table>

Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search: 18 October 2005 (18.10.2005)

Date of mailing of the international search report: 27 FEB 2006

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. (703) 305-3230

Form PCT/ISA/210 (second sheet) (April 2005)
**INTERNATIONAL SEARCH REPORT**

**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.:
   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:

Please See Continuation Sheet

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 any 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. [X] 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.: 1-4

**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.

Form PCT/ISA/210 (continuation of first sheet(2)) (April 2005)
BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim(s) 1-4, drawn to a method of identifying a compound capable of modulating a FATP5-mediated metabolic disorder [FATP5 having Acyl-CoA/bile acid CoA ligase activity], by measuring the CoA ligase activity.

Group II, claim(s) 5-7, drawn to a method of identifying a compound capable of modulating a FATP5-mediated metabolic disorder [FATP5 having Acyl-CoA/bile acid CoA ligase activity], by measuring the binding of the compound to FATP5 polypeptide.

Group III, claim(s) 8-13, drawn to a method of identifying a compound capable of modulating a FATP5-mediated metabolic disorder [FATP5 having Acyl-CoA/bile acid CoA ligase activity], by measuring the expression of FATP5 polypeptide.

Group IV, claim(s) 14-16, drawn to a method of identifying a compound capable of modulating a FATP5-mediated metabolic disorder [FATP5 having Acyl-CoA/bile acid CoA ligase activity], by measuring the uptake of bile acid with a test cell expressing a FATP5 polypeptide.

The inventions listed as Groups I-IV do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: Group I has the special technical feature of a method which measures the acyl-CoA ligase activity of the FATP5 polypeptide as a result of the addition of the test compound, which groups II-IV do not share; Group II has the special technical feature of a method which measures binding of the compound to FATP5 polypeptide, which groups I and III-IV do not share; Group III has the special technical feature of a method which measures expression of the FATP5 polypeptide as a result of the addition of the test compound to a cell expressing FATP5 polypeptide, which groups I-III & IV do not share; Group IV has the special technical feature of a method which measures the uptake of fatty acid or bile acid in the test cell as a result of the addition of the test compound to a cell expressing FATP5 polypeptide, which groups I-III do not share. Thus the various groups discussed above show a lack of unity of invention.