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Published:
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For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

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(54) **Title:** 32146 AND 57259, NOVEL HUMAN TRANSPORTERS AND USES THEREOF

(57) **Abstract:** The invention provides isolated nucleic acids molecules, designated TFM-2 and TFM-3 nucleic acid molecules, which encode novel transporter family molecules. The invention also provides antisense nucleic acid molecules, recombinant expression vectors containing TFM-2 and/or TFM-3 nucleic acid molecules, host cells into which the expression vectors have been introduced, and nonhuman transgenic animals in which a TFM-2 and/or TFM-3 gene has been introduced or disrupted. The invention still further provides isolated TFM-2 and TFM-3 polypeptides, fusion polypeptides, antigenic peptides and anti-TFM-2 and anti-TFM-3 antibodies. Diagnostic methods utilizing compositions of the invention are also provided.

INTERNATIONAL SEARCH REPORT

International Application No
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A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/12 C12N15/11 C12N15/62 C12N5/10 C12Q1/68
C12N1/21 C07K14/705 C07K16/18 G01N33/68 A61K31/7088
A61K38/17 A61K39/395 A01K67/027

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)
IPC 7 C07K C12N C12Q G01N A61K A01K

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)
SEQUENCE SEARCH, EPO-Internal, WPI Data, PAJ, BIOSIS, MEDLINE, EMBL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL [Online] 24 May 2000 (2000-05-24) ZHANG C. ET AL.: Database accession no. AF116652 XP002214125 abstract ---	5-13
A	HALESTRAP ANDREW P ET AL: "The proton-linked monocarboxylate transporter (MCT) family: Structure, function and regulation" BIOCHEMICAL JOURNAL, PORTLAND PRESS, LONDON, GB, vol. 343, no. 2, 15 October 1999 (1999-10-15), pages 281-299, XP002205906 ISSN: 0264-6021 --- -/--	

[X] Further documents are listed in the continuation of box C.

[X] Patent family members are listed in 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 document 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 another 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	Date of mailing of the international search report
19 September 2002	15. 01. 2003

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Schneider, P

Form PCT/ISA/210 (second sheet) (July 1992)

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	PRICE NT ET AL: "Cloning and sequencing of four new mammalian monocarboxylate transporter (MCT) homologues confirms the existence of a transporter family with an ancient past" BIOCHEMICAL JOURNAL, PORTLAND PRESS, LONDON, GB, vol. 329, no. 2, 15 January 1998 (1998-01-15), pages 321-328, XP002108394 ISSN: 0264-6021 ---	
A	GARCIA C K ET AL: "CDNA CLONING OF THE HUMAN MONACARBOXYLATE TRANSPORTER 1 AND CHROMOSOMAL LOCALIZATION OF THE SLC16A1 LOCUS TO 1P13.2-P12" GENOMICS, ACADEMIC PRESS, SAN DIEGO, US, vol. 2, no. 23, 15 September 1994 (1994-09-15), pages 500-503, XP001085472 ISSN: 0888-7543 ---	
A	WO 99 41373 A (INCYTE PHARMA INC ;CORLEY NEIL C (US); YUE HENRY (US); AU YOUNG JA) 19 August 1999 (1999-08-19) ---	
E	WO 02 12340 A (INCYTE GENOMICS, INC.) 14 February 2002 (2002-02-14) page 12 -page 17 page 59 page 91 page 112 page 191 -page 192 page 224 -page 225 -----	2,4-26

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/31412

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.: 3 (complete), 25 (partially)
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:
see FURTHER INFORMATION sheet PCT/ISA/210

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 II Observations where unity of invention is lacking (Continuation of item 2 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 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.:
1-26 (partially)

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

Continuation of Box I.2

Claims Nos.: 3 (complete), 25 (partially)

The subject-matter of claim 3 is not defined and can therefore not be searched.

Present claims 25 relates to a product/compound defined by reference to a desirable characteristic or property, namely a binding compoud. The claims cover all products/compounds having this characteristic or property, whereas the application provides support within the meaning of Article 6 PCT and/or disclosure within the meaning of Article 5 PCT for only a very limited number of such products/compounds. In the present case, the claims so lack support, and the application so lacks disclosure, that a meaningful search over the whole of the claimed scope is impossible. Independent of the above reasoning, the claims also lack clarity (Article 6 PCT). An attempt is made to define the product/compound by reference to a result to be achieved. Again, this lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Consequently, the search has been carried out for those parts of the claims which appear to be clear, supported and disclosed, namely those parts relating to the product/compound antibody disclosed on page 35 of the decription.

The applicant's attention is drawn to the fact that claims, or parts of claims, relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. Claims: 1-26 (partially)

   A putative human transporter (TFM-2) as defined by SEQ ID NO:1 to 3 and related to said sequences a vector, a host cell, an antibody, a method to detect a polypeptide or nucleic acid, a method to identify a binding agent, a method to modulate the activity of the polypeptide and a method to identify a modulator.

2. Claims: 1-26 (partially)

   Same as invention no. 1, but for TFM-3 as defined by SEQ ID NO:4 to 6.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No
PCT/US 01/31412

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9941373 A	19-08-1999	AU 2587399 A	30-08-1999
		CA 2320424 A1	19-08-1999
		EP 1053320 A2	22-11-2000
		JP 2002503463 T	05-02-2002
		WO 9941373 A2	19-08-1999
WO 0212340 A		NONE	