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For two-letter codes and other abbreviations, refer to the "Guid-
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ning of each regular issue of the PCT Gazette.



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(54) Title: 23949 AND 32391, HUMAN ION CHANNELS AND USES THEREOF

(57) Abstract: The invention provides isolated nucleic acid molecules, designated IC nucleic acid molecules, which encode novel IC-related ion channel molecules. The invention also provides antisense nucleic acid molecules, recombinant expression vectors containing IC nucleic acid molecules, host cells into which the expression vectors have been introduced, and non-human transgenic animals in which an IC gene has been introduced or disrupted. The invention still further provides isolated IC proteins, fusion proteins, antigenic peptides and anti-IC antibodies. Diagnostic methods utilizing compositions of the invention are also provided.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/13722

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/12 C12N15/62 C12N15/70 C12N15/85 C12N5/10
 C07K14/705 C07K16/28 C12Q1/68 G01N33/50 G01N33/68

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)

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)

EPO-Internal, SEQUENCE SEARCH, MEDLINE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	LEE J-H ET AL: "Cloning of a novel four repeat protein related to voltage-gated sodium and calcium channels" FEBS LETTERS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 445, no. 2-3, 26 February 1999 (1999-02-26), pages 231-236, XP004259263 ISSN: 0014-5793	5-13,15, 20-22
X	--- DATABASE EBI [Online] Hinxton, UK; Accession number: AK002089, ISOGAI ET AL.: XP002186315 See nucleotides 1-473 --- -/--	5-11, 20-22

Further documents are listed in the continuation of box C.

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

14 January 2002

Date of mailing of the international search report

25. 04. 2002

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/13722

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>DATABASE EBI [Online] Hinxton, UK; Accession number: L34599, XP002186316 See nucleotide 60-5273</p>	5-11, 20-22
X	<p>--- WO 99 66041 A (ENDRESS GREGORY A ;FLORENCE KIMBERLY A (US); HUMAN GENOME SCIENCES) 23 December 1999 (1999-12-23) Seq Id no 46 -& DATABASE EBI [Online] Hinxton, UK; Accession number: AAZ97054, RUBEN ET AL.: XP002187025 Database entry of Seq Id 46 See nucleotides 9-345</p>	5-11, 20-22
X	<p>--- WO 98 45437 A (GENETICS INST) 15 October 1998 (1998-10-15) EST clone 814 -& DATABASE EBI [Online] Hinxton, UK; Accession number: AAV88085, AGOSTINO ET AL.: XP002187034 Database entry of clone 814 See nucleotides 185-870</p>	5-11, 20-22
P,X	<p>--- EP 1 074 617 A (HELIX RES INST) 7 February 2001 (2001-02-07) Seq Ids no 4768, 13058 -& DATABASE EBI [Online] Hinxton, UK; Accession number: AAH07933, OTA ET AL.: XP002187026 Database entry of Seq Id no 4768 See nucleotides 1-473 -& DATABASE EBI [Online] Hinxton, UK; Accession number: AAH15060, OTA ET AL.: XP002187027 Database entry of Seq Id no 13058 See nucleotides 1-473</p>	5-11, 20-22
A	<p>--- WO 99 28342 A (SIBIA NEUROSCIENCES INC ;WILLIAMS MARK (US); HANS MICHAEL (US); HA) 10 June 1999 (1999-06-10) -----</p>	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/13722

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:

Although claim 25 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
2. Claims Nos.: 17, 19, 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 (all 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.: 17, 19, 25 Partially

Present claims 17, 19, 25 relate to a method (claims 17, 25) or an apparatus ("a kit"; claim 19) defined by reference to a desirable characteristic or property, namely the ability of a compound to bind to and modulate the activity of the polypeptide of claim 13.

The claims cover all 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 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 compound by reference to a result to be achieved. This lack of clarity in the present case is such as to render a meaningful search over the whole of the claimed scope impossible. Hence, the search regarding claims 17, 19, 25 has been limited to antibodies.

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)

Nucleotide sequences no 1,3
Protein sequence no 2

2. Claims: 1-26 (Partially)

Nucleotide sequences no 4,6
Protein sequence no 5

INTERNATIONAL SEARCH REPORT

Information on patent family members

Internat..... Application No

PCT/US 01/13722

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