(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
22 November 2001 (22.11.2001)

PCT

(10) International Publication Number
WO 01/87932 A3

(51) International Patent Classification[7]: C12N 15/12, C07K 14/705, C12Q 1/68, G01N 33/68

(21) International Application Number: PCT/US01/15048

(22) International Filing Date: 11 May 2001 (11.05.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/203,875 12 May 2000 (12.05.2000) US
60/207,932 30 May 2000 (30.05.2000) US

(71) Applicant: **LEXICON GENETICS INCORPORATED** [US/US]; 4000 Research Forest Drive, The Woodlands, TX 77381 (US).

(72) Inventors: **HU, Yi**; 333 Holly Creek Court #203, The Woodlands, TX 77381 (US). **NEPOMNICHY, Boris**; 905 Cypress Station Drive #1515, Houston, TX 77909 (US). **WANG, Xioaming**; 4088 Commerical Avenue, Northbrook, IL 60062 (US). **WALKE, D., Wade**; 7507 Danehill Drive, Spring, TX 77389 (US). **GERHARDT, Brenda**; 2123 Knollbrook Lane, Spring, TX 77373 (US). **TURNER, C., Alexander, Jr.**; 67 Winter Wheat Place, The Woodlands, TX 77381 (US).

(74) Agents: **GARRETT, Arthur, S.** et al.; Finnegan, Henderson, Farabow, Garrett & Dunner, L.L.P., 1300 I Street, N.W., Washington, DC 20005-3315 (US).

(81) Designated States *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZW.

(84) Designated States *(regional)*: ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published:
— *with international search report*

(88) Date of publication of the international search report:
2 May 2002

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.

WO 01/87932 A3

(54) Title: SEVEN TRANSMEMBRANE PROTEINS AND POLYNUCLEOTIDES ENCODING THE SAME

(57) Abstract: Nucleotide and amino acid sequences of several G protein coupled receptors are described.

INTERNATIONAL SEARCH REPORT

Inte ional Application No
PCT/US 01/15048

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/12 C07K14/705 C12Q1/68 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)
IPC 7 C12N C07K C12Q G01N

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)
EMBL, EPO-Internal, WPI Data, PAJ, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EM_EST [Online] EMBL; ID AA625755, AC AA625755, 28 October 1997 (1997-10-28) HILLIER L ET AL.: "zu91g01.s1 Soares_testis_NHT Homo sapiens cDNA clone IMAGE:745392 3', mRNA sequence" XP002182070 Note: 99.7% nt seq identity (100.0% ungapped) with SEQ ID NO:5 in 320 nt overlap (78-397:529-211) the whole document --- -/--	3

[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
6 November 2001	15. 02. 2002

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	van de Kamp, M

3

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.
X	DATABASE EM_EST [Online] EMBL; ID HS1254429, AC AA459569, 16 June 1997 (1997-06-16) NATIONAL CANCER INSTITUTE, CANCER GENOME ANATOMY PROJECT (CGAP): "aa27e08.r1 NCI_CGAP_GCB1 Homo sapiens cDNA clone IMAGE:814502 5', mRNA sequence" XP002182071 Note: 100.0% nt seq identity with SEQ ID NO:5 in 187 nt overlap (108-294:3021-3207) the whole document --- DATABASE EM_HTG [Online] EMBL; ID AC010896, ID AC010896, 26 September 1999 (1999-09-26) WATERSTON R H: "Homo sapiens chromosome UNK clone RP11-499P9, WORKING DRAFT SEQUENCE, 3 unordered pieces" XP002182072 Note: 98.5% nt seq identity with SEQ ID NO:5 in 1427 nt overlap (82706-84131:2863-1437) page 20	3
A	WO 00 15793 A (INCYTE PHARMA INC ;CORLEY NEIL C (US); BANDMAN OLGA (US); BAUGHN M) 23 March 2000 (2000-03-23) Note: 29.5% aa seq identity of SEQ ID NO:6 with SEQ ID NO:2 in 763 aa overlap (26-758:251-974), 58.9% nt seq identity of SEQ ID NO:12 with SEQ ID NO:5 in 603 nt overlap (1684-2273:2337-2924) page 2, line 28 -page 4, line 28 tables 1-4 claims 1,9	1,8,13, 16
A	ABE J ET AL.: "Ig-Hepta, a novel member of the G protein-coupled hepta-helical receptor (GPCR) family that has immunoglobulin-like repeats in a long N-terminal extracellular domain and defines a new subfamily of GPCRs." JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 274, no. 28, 9 July 1999 (1999-07-09), pages 19957-19964, XP002182069 ISSN: 0021-9258 Note: 30.4% aa seq identity with SEQ ID NO:2 in 805 aa overlap (525-1300:216-974) abstract figures 1,2 --- -/--	1,8

3

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WILSON S ET AL.: "Orphan G-protein-coupled receptors: the next generation of drug targets?" BRITISH JOURNAL OF PHARMACOLOGY, vol. 125, no. 7, December 1998 (1998-12), pages 1387-1392, XP001010584 ISSN: 0007-1188 the whole document	16

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/15048

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.:
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 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.:

1,3,4,8,10,11,13-16 (all partially); 2,5,6,9,12(all completely)

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

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

1. Claims: 1,3,4,8,10,11,13-16 (all partially); 2,5,6,9, 12 (all completely)

An isolated nucleic acid molecule comprising a nucleotide sequence selected from the nucleotide sequences as set forth in SEQ ID NOs 1,3 and 5, or comprising at least 22 contiguous bases of said nucleotide sequences, or being at least 95% identical to said nucleotide sequences, or encoding an amino acid sequence as set forth in SEQ ID NOs 2 or 4. An isolated polypeptide comprising an amino acid sequence selected from the amino acid sequences as set forth in SEQ ID NOs 2 and 4, or being at least 95% identical to said amino acid sequences, or comprising an amino acid sequence as set forth in SEQ ID NO:2 with at least one conservative amino acid substitution. Recombinant host cells containing a nucleic acid molecule as said. A method for identifying a molecule that binds to a polypeptide as said.

2. Claims: 1,3,4,8,10,11,13-16 (all partially); 7 (completely)

An isolated nucleic acid molecule comprising a nucleotide sequence as set forth in SEQ ID NO:6, or comprising at least 22 contiguous bases of said nucleotide sequence, or being at least 95% identical to said nucleotide sequence, or encoding an amino acid sequence as set forth in SEQ ID NO:7. An isolated polypeptide comprising an amino acid sequence as set forth in SEQ ID NO:7, or being at least 95% identical to said amino acid sequence. Recombinant host cells containing a nucleic acid molecule as said. A method for identifying a molecule that binds to a polypeptide as said.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte ional Application No
PCT/US 01/15048

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0015793 A	23-03-2000	AU 6035999 A	03-04-2000
		EP 1114155 A2	11-07-2001
		WO 0015793 A2	23-03-2000