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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
2 August 2001 (02.08.2001)

PCT

(10) International Publication Number
WO 01/055318 A3

(51) International Patent Classification[7]: C07H 21/02, 21/04, C07K 5/00, 14/00, C12Q 1/68, C12P 21/06, C12N 1/20, 15/63, 5/00

(21) International Application Number: PCT/US01/01332

(22) International Filing Date: 17 January 2001 (17.01.2001)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

| | | |
|---|---|---|
| 60/179,065 | 31 January 2000 (31.01.2000) | US |
| 60/180,628 | 4 February 2000 (04.02.2000) | US |
| 60/184,664 | 24 February 2000 (24.02.2000) | US |
| 60/186,350 | 2 March 2000 (02.03.2000) | US |
| 60/189,874 | 16 March 2000 (16.03.2000) | US |
| 60/190,076 | 17 March 2000 (17.03.2000) | US |
| 60/198,123 | 18 April 2000 (18.04.2000) | US |
| 60/205,515 | 19 May 2000 (19.05.2000) | US |
| 60/209,467 | 7 June 2000 (07.06.2000) | US |
| 60/214,886 | 28 June 2000 (28.06.2000) | US |
| 60/215,135 | 30 June 2000 (30.06.2000) | US |
| 60/216,647 | 7 July 2000 (07.07.2000) | US |
| 60/216,880 | 7 July 2000 (07.07.2000) | US |
| 60/217,487 | 11 July 2000 (11.07.2000) | US |
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| 60/237,038 | 2 October 2000 (02.10.2000) | US |
| 60/237,039 | 2 October 2000 (02.10.2000) | US |
| 60/237,040 | 2 October 2000 (02.10.2000) | US |
| 60/237,037 | 2 October 2000 (02.10.2000) | US |

*[Continued on next page]*

(54) Title: NUCLEIC ACIDS, PROTEINS, AND ANTIBODIES

(57) Abstract: The present invention relates to novel proteins. More specifically, isolated nucleic acid molecules are provided encoding novel polypeptides. Novel polypeptides and antibodies that bind to these polypeptides are provided. Also provided are vectors, host cells, and recombinant and synthetic methods for producing human polynucleotides and/or polypeptides, and antibodies. The invention further relates to diagnostic and therapeutic methods useful for diagnosing, treating, preventing and/or prognosing disorders related to these novel polypeptides. The invention further relates to screening methods for identifying agonists and antagonists of polynucleotides and polypeptides of the invention. The present invention further relates to methods and/or compositions for inhibiting or enhancing the production and function of the polypeptides of the present invention.

WO 01/055318 A3

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(71) **Applicant** *(for all designated States except US)*: **HUMAN GENOME SCIENCES, INC.** [US/US]; 9410 Key West Avenue, Rockville, MD 20850 (US).

(72) **Inventors; and**

(75) **Inventors/Applicants** *(for US only)*: **ROSEN, Craig, A.** [US/US]; 22400 Rolling Hill Lane, Laytonsville, MD 20882 (US). **BARASH, Steven, C.** [US/US]; 111 Watkins Pond Boulevard, #301, Rockville, MD 20850 (US). **RUBEN, Steven, M.** [US/US]; 18528 Heritage Hills Drive, Olney, MD 20832 (US).

(74) **Agents: HOOVER, Kenley, K.** et al.; Human Genome Sciences, Inc., 9410 Key West Avenue, Rockville, MD 20850 (US).



(81) **Designated States** *(national)*: AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CR, CU, CZ, DE, DK, DM, DZ, 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, US, 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*

— *with sequence listing part of description published separately in electronic form and available upon request from the International Bureau*

(88) **Date of publication of the international search report:**
4 July 2002

(15) **Information about Correction:**
**Previous Correction:**
see PCT Gazette No. 36/2001 of 7 September 2001, Section II


*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.*

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01332

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : Please See Extra Sheet.
US CL : Please See Extra Sheet.

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. : 536/23.1, 23.5, 24.31; 530/300, 350; 435/6, 69.1, 252.3, 320.1, 325

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)

Please See Extra Sheet.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|---|---|---|
| X, P | Database: GenEmbl; Accession NO: AC010932; ; Birren et al.; "Homo sapiens chromosome 15, clone RP11-296E22"; 26 May 2000; having 96.8% sequence identity to SEQ ID NO: 11; see entire document. | 1-7, 21 |
| X, P | Database: EST; Accession NO: AW026547; NCI/NINDS-CGAP; "NCI_CGAP_Brn23 Homo sapiens cDNA clone"; 09 March 2000; having 99.5% sequence identity to SEQ ID NO: 11; vector: pT7T3D-Pac; host cell: DH10B; see entire document. | 1-10, 14, 15, 21 |
| X, P | Database: SPTREMBL_15; Accession NO: Q9JMH4; Yamamoto et al.; "Mesocricetus auratus mRNAfor type XVII collagen"; 01 October 2000; having 38% sequence identity to SEQ ID NO: 609; see entire document. | 1-7, 21 |

☐ Further documents are listed in the continuation of Box C. ☐ See patent family annex.

| | | | |
|---|---|---|---|
| * | Special categories of cited documents: | "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 |
| "A" | document defining the general state of the art which is not considered to be of particular relevance | "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 |
| "E" | earlier document published on or after the international filing date | "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 |
| "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) | "&" | document member of the same patent family |
| "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 | | |

Date of the actual completion of the international search
03 JUNE 2001

Date of mailing of the international search report
02 AUG 2001

Name and mailing address of the ISA/US
Commissioner of Patents and Trademarks
Box PCT
Washington, D.C. 20231
Facsimile No. (703) 305-3230

Authorized officer
RITA MITRA
Telephone No. (703) 308-0196

Form PCT/ISA/210 (second sheet) (July 1998) ★

# INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01332

**Box I Observations where certain claims were found unsearchable (Continuation of item 1 of first sheet)**

This international 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:

Please See Extra 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.:
1-10, 14, 15 and 21, all in part

**Remark on Protest**

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

☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US01/01332

A. CLASSIFICATION OF SUBJECT MATTER:
IPC (7):

C07H 21/02, 21/04; C07K 5/00, 14/00; C12Q 1/68; C12P 21/06; C12N 1/20, 15/63, 5/00

A. CLASSIFICATION OF SUBJECT MATTER:
US CL :

536/23.1, 23.5, 24.31; 530/300, 350; 435/6, 69.1, 252.3, 320.1, 325

B. FIELDS SEARCHED
Electronic data bases consulted (Name of data base and where practicable terms used):

Sequence Search (Database: GenEmbl, N_Geneseq_0401, Issued _Patents_NA, EST, A_Geneseq_0401, Issued_Patents_AA, PIR_67, SwissProt_39, SPTREMBL_15)

STN (Database: biosis, caplus, embase, medline, scisearch)

EAST (Database: USPTO, EPO, JPO, Derwent)

Search Terms: neurons, axons, synapses, Ca mediated exocytosis, neurotransmitter, polynucleotides

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING
This ISA found multiple inventions as follows:

This application contains the following inventions or groups of inventions which are not so linked as to form a single inventive concept under PCT Rule 13.1. In order for all inventions to be searched, the appropriate additional search fees must be paid.

Groups 1-598, claims 1-10, 14, 15 and 21, all in part, drawn to an isolated nucleic acid of SEQ ID NO X or a peptide of SEQ ID NO: Y, wherein X and Y are values that correlate to those listed in Table 1A, and correspond to one of the cDNA Clone IDs, respectively. For examples,

If group 1 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein X is 11 and Y is 609.

If group 2 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein X is 12 and Y is 610.

Groups 599-1196, claims 11, 12 and 16, all in part, each group directed to a peptide of SEQ ID NO; Y, wherein Y correlates to one of those listed in Table 1A, and corresponds to one of the cDNA Clone IDs, respectively. For examples,

If group 599 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein Y is 609.

If group 600 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein Y is 610.

Groups 1197-1794 claim 13, in part, drawn to an isolated antibody which binds to a protein with SEQ ID NO Y, wherein Y correlates to one of those listed in Table 1A, and corresponds to one of the cDNA Clone IDs, respectively. For examples,

If group 1197 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein Y is 609.

If group 1198 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein Y is 610.

Groups 1795-2392, claim 17, in part, drawn to a method for preventing, treating or ameliorating an undefined medical condition by administering a polynucleotide of SEQ ID NO X encoding a protein of SEQ ID NO Y, wherein X and Y correlate to one of those listed in Table 1A, and correspond to one of the cDNA Clone IDs, respectively. For examples,

If group 1795 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein X is 11 and Y is 609.

If group 1796 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein X is 12 and Y is 610.

Groups 2393-2990, claim 18, in part, drawn to a method of diagnosis of an undefined pathological condition by determining the presence or absence of a mutation in a polynucleotide of SEQ ID NO X, wherein X correlates to one of those listed in Table 1A, and corresponds to one of the cDNA Clone IDs, respectively. For examples,

If group 2393 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein X is 11.

If group 2394 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein X is 12.

Groups 2991-3588 claim 19, in part, drawn to a method of diagnosis of an undefined pathological condition by determining the presence or amount of expression of the polypeptide of SEQ ID NO y, wherein y correlates to one of those listed in Table 1A, and corresponds to one of the cDNA Clone IDs, respectively. For examples,

If group 2991 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein y is 609.

If group 2992 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein y is 610.

Groups 3589-4186, claim 20, in part, drawn to a method of identifying a binding partner to a polypeptide defined by SEQ ID NO Y, wherein Y correlates to one of those listed in Table 1A, and corresponds to one of the cDNA Clone IDs, respectively. For examples,

If group 3589 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein Y is 609.

If group 3590 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein Y is 610.

Groups 4187-4784, claim 22, in part, drawn to a method of identifying an activity in a biological assay by identification of the protein in the supernatant wherein the cell expresses a polypeptide encoded by SEQ ID NO X, wherein X correlates to one of those listed in Table 1A, and corresponds to one of the cDNA Clone IDs, respectively. For examples,

If group 4187 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein X is 11.

If group 4188 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein X is 12.

Groups 4785-5382 claim 23, in part, each group directed to a peptide produced by the method for the identifying a binding partner to a polypeptide defined by SEQ ID NO: Y, wherein Y correlates to one of those listed in Table 1A, and corresponds to one of the cDNA Clone IDs, respectively. For examples,

If group 4785 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein Y is 609.

If group 4786 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein Y is 610.

Groups 5383-5980, claim 24, in part, drawn to a method for preventing, treating or ameliorating an undefined medical condition by administering a polypeptide of SEQ ID NO Y, wherein Y correlates to one of those listed in Table 1A, and corresponds to one of the cDNA Clone IDs, respectively. For examples,

If group 5383 is elected, this correlates to Gene No 1, cDNA clone ID HTPAD46 of Table 1A, wherein Y is 609.

If group 5384 is elected, this correlates to Gene No 2, cDNA clone ID HCWFF88, wherein Y is 610.

The inventions listed as Groups 1-5980 do not relate to a single 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:

The polynucleotides and polypeptides of each of the clones in Table 1 are unrelated, each to the other. The polynucleotide sequences encode structurally distinct polypeptides and do not share a special technical feature. Furthermore, the technical feature that links the DNA, protein, antibody, methods of CDNA clone HTPAD46(see Table 1A)is not a contribution over the prior arts of Birren et al., NCI/NINDS-CGAP and Yamamoto et al. See the various documents cited in the search report. Thus the technical feature of the polynucleotide sequence is not special and the

groups are not so linked under PCT Rule 13.1. Additionally the claimed methods produce different products and/or different results which are not coextensive and which do not share the same technical feature.