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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
25 May 2001 (25.05.2001)

PCT

(10) International Publication Number
WO 01/36635 A3

(51) International Patent Classification[7]: C12N 15/12, C07K 14/475, G01N 33/53, C12Q 1/68, A61K 38/18, 31/70, 39/395, A01K 67/027

(21) International Application Number: PCT/US00/31170

(22) International Filing Date:
15 November 2000 (15.11.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

60/165,733	15 November 1999 (15.11.1999)	US
60/166,178	18 November 1999 (18.11.1999)	US
60/166,288	18 November 1999 (18.11.1999)	US
60/166,143	18 November 1999 (18.11.1999)	US
60/167,471	24 November 1999 (24.11.1999)	US
Not furnished	14 November 2000 (14.11.2000)	US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier applications:

US	60/165,733 (CIP)
Filed on	15 November 1999 (15.11.1999)
US	60/166,143 (CIP)
Filed on	18 November 1999 (18.11.1999)
US	60/166,288 (CIP)
Filed on	18 November 1999 (18.11.1999)
US	60/166,178 (CIP)
Filed on	18 November 1999 (18.11.1999)
US	60/167,471 (CIP)
Filed on	24 November 1999 (24.11.1999)
US	Not furnished (CIP)
Filed on	14 November 2000 (14.11.2000)

(71) Applicant *(for all designated States except US)*: **CURAGEN CORPORATION** [US/US]; 555 Long Wharf Drive, 11th floor, New Haven, CT 06511 (US).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **MAJUMDER, Kumud** [US/US]; 140 Silver Hill Lane, Stamford, CT 06905 (US). **PRAYAGA, Sudhirdas, K.** [IN/US]; 1602 Westmead Drive, Chesterfield, MO 63017 (US). **BURGESS, Catherine** [US/US]; 90 Carriage Hill Drive, Wethersfield, CT 06109 (US).

(74) Agent: **ELRIFI, Ivor, R.**; Mintz, Levin, Cohn, Ferris, Glovsky and Popeo, P.C., One Financial Center, Boston, MA 02111 (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*

(88) Date of publication of the international search report:
21 March 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 01/36635 A3

(54) Title: NEURITE OUTGROWTH-PROMOTING FACTOR HOMOLOGUE AND NUCLEIC ACIDS ENCODING SAME

(57) Abstract: The present invention provides FCTRX, a novel isolated polypeptide, as well as a polynucleotide encoding FCTRX and antibodies that immunospecifically bind to FCTRX or any derivative, variant, mutant, or fragment of the FCTRX polypeptide, polynucleotide or antibody. The invention additionally provides methods in which the FCTRX polypeptide, polynucleotide and antibody are used in detection and treatment of a broad range of pathological states, as well as to other uses.

INTERNATIONAL SEARCH REPORT

Inte onal Application No
PCT/US 00/31170

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/12 C07K14/475 G01N33/53 C12Q1/68 A61K38/18
A61K31/70 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 C12N C07K 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)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 99 54448 A (SCHMITT ARMIN ;SPECHT THOMAS (DE); DAHL EDGAR (DE); HINZMANN BERND) 28 October 1999 (1999-10-28) * see seq.ID.27 (MK) * ---	1,2,4-7, 9-43
X	KRETSCHMER, P.J. ET AL.: "Cloning, characterization and developmental regulation of two members of a novel human gene family of neurite outgrowth-promoting proteins." GROWTH FACTORS, vol. 5, no. 2, 1991, pages 99-114, XP000993435 the whole document ---	1,2,4-7, 9-43
X	EP 0 569 703 A (AMERICAN CYANAMID CO) 18 November 1993 (1993-11-18) the whole document --- -/--	1,2,4-7, 9-43

[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
3 August 2001	30. 10. 01

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	Smalt, R

1

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

INTERNATIONAL SEARCH REPORT

Inte onal Application No
PCT/US 00/31170

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 94 13800 A (HEATH JOHN KAYE ;CANCER RES CAMPAIGN TECH (GB)) 23 June 1994 (1994-06-23) the whole document ---	1,2,4-7, 9-43
X	EP 0 476 233 A (AMERICAN CYANAMID CO) 25 March 1992 (1992-03-25) the whole document ---	1,2,4-7, 9-43
A	GEORGE D L ET AL: "THE GENES FOR GROWTH HORMONE AND CHORIONIC SOMATOMAMMOTROPIN ARE ON THE LONG ARM OF HUMAN CHROMOSOME 17 IN REGION Q21-QTER" HUMAN GENETICS, vol. 57, no. 2, 1981, pages 138-141, XP000993461 ISSN: 0340-6717 the whole document -----	

1

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 00/31170

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. [X] Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 23-28, 42, 43, and claim 22 in as far as it pertains to in vivo methods, 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.:
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. [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.:

Claims 1-43, 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

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

1. Claims: 1-43, all partially

FCTR1 polypeptide according to seq.ID.2 or variants thereof with no more than 15% amino acid changes, nucleic acids encoding said proteins (e.g. seq.ID.1), vector comprising said nucleic acid, cell comprising said vector, antibody against said polypeptide, method for detecting said polypeptide using said antibody, method for detecting said nucleic acid using a probe, methods for identifying compounds that interact with said polypeptide, use of said antibody, nucleic acid, or interacting compound in pharmaceutical compositions and kits.

2. Claims: 1-43, all partially

FCTR2 polypeptide according to seq.ID.4 or variants thereof with no more than 15% amino acid changes, nucleic acids encoding said proteins (e.g. seq.ID.3), vector comprising said nucleic acid, cell comprising said vector, antibody against said polypeptide, method for detecting said polypeptide using said antibody, method for detecting said nucleic acid using a probe, methods for identifying compounds that interact with said polypeptide, use of said antibody, nucleic acid, or interacting compound in pharmaceutical compositions and kits.

3. Claims: 1-43, all partially

FCTR3 polypeptide according to seq.ID.6 or variants thereof with no more than 15% amino acid changes, nucleic acids encoding said proteins (e.g. seq.ID.5), vector comprising said nucleic acid, cell comprising said vector, antibody against said polypeptide, method for detecting said polypeptide using said antibody, method for detecting said nucleic acid using a probe, methods for identifying compounds that interact with said polypeptide, use of said antibody, nucleic acid, or interacting compound in pharmaceutical compositions and kits.

4. Claims: 1-43, all partially

FCTR4 polypeptide according to seq.ID.8 or variants thereof with no more than 15% amino acid changes, nucleic acids encoding said proteins (e.g. seq.ID.7), vector comprising said nucleic acid, cell comprising said vector, antibody against said polypeptide, method for detecting said polypeptide using said antibody, method for detecting said nucleic acid using a probe, methods for identifying compounds that interact with said polypeptide, use of said

antibody, nucleic acid, or interacting compound in pharmaceutical compositions and kits.

5. Claims: 1-43, all partially

FCTR5 polypeptide according to seq.ID.10 or variants thereof with no more than 15% amino acid changes, nucleic acids encoding said proteins (e.g. seq.ID.9), vector comprising said nucleic acid, cell comprising said vector, antibody against said polypeptide, method for detecting said polypeptide using said antibody, method for detecting said nucleic acid using a probe, methods for identifying compounds that interact with said polypeptide, use of said antibody, nucleic acid, or interacting compound in pharmaceutical compositions and kits.

6. Claims: 1-43, all partially

FCTR6 polypeptide according to seq.ID.12 or variants thereof with no more than 15% amino acid changes, nucleic acids encoding said proteins (e.g. seq.ID.11), vector comprising said nucleic acid, cell comprising said vector, antibody against said polypeptide, method for detecting said polypeptide using said antibody, method for detecting said nucleic acid using a probe, methods for identifying compounds that interact with said polypeptide, use of said antibody, nucleic acid, or interacting compound in pharmaceutical compositions and kits.

INTERNATIONAL SEARCH REPORT

Information on patent family members

Inte onal Application No
PCT/US 00/31170

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9954448 A	28-10-1999	DE 19817947 A1	28-10-1999
		WO 9954448 A2	28-10-1999
		EP 1080188 A2	07-03-2001
EP 0569703 A	18-11-1993	US 5461029 A	24-10-1995
		AU 3717693 A	28-10-1993
		CA 2094797 A1	25-10-1993
		EP 0569703 A2	18-11-1993
		JP 6025007 A	01-02-1994
		ZA 9302879 A	24-08-1994
WO 9413800 A	23-06-1994	AU 5656694 A	04-07-1994
		WO 9413800 A2	23-06-1994
EP 0476233 A	25-03-1992	US 5210026 A	11-05-1993
		AT 134219 T	15-02-1996
		AU 636789 B2	06-05-1993
		AU 8258591 A	27-02-1992
		CA 2049370 A1	21-02-1992
		DE 69117123 D1	28-03-1996
		DE 69117123 T2	02-10-1996
		DK 476233 T3	11-03-1996
		EP 0476233 A1	25-03-1992
		ES 2085928 T3	16-06-1996
		GR 3019059 T3	31-05-1996
		JP 6217778 A	09-08-1994
		NZ 239357 A	27-07-1993
		PT 98694 A	31-07-1992
		ZA 9106552 A	27-05-1992