



INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

<p>(51) International Patent Classification ⁷ : C12N 15/12, C07K 14/72</p>	A3	<p>(11) International Publication Number: WO 00/31258 (43) International Publication Date: 2 June 2000 (02.06.00)</p>																																																																				
<p>(21) International Application Number: PCT/US99/23687 (22) International Filing Date: 13 October 1999 (13.10.99)</p> <p>(30) Priority Data:</p> <table border="0"> <tr><td>60/109,213</td><td>20 November 1998 (20.11.98)</td><td>US</td></tr> <tr><td>60/120,416</td><td>16 February 1999 (16.02.99)</td><td>US</td></tr> <tr><td>60/121,852</td><td>26 February 1999 (26.02.99)</td><td>US</td></tr> <tr><td>60/123,946</td><td>12 March 1999 (12.03.99)</td><td>US</td></tr> <tr><td>60/123,949</td><td>12 March 1999 (12.03.99)</td><td>US</td></tr> <tr><td>60/136,436</td><td>28 May 1999 (28.05.99)</td><td>US</td></tr> <tr><td>60/136,437</td><td>28 May 1999 (28.05.99)</td><td>US</td></tr> <tr><td>60/136,439</td><td>28 May 1999 (28.05.99)</td><td>US</td></tr> <tr><td>60/136,567</td><td>28 May 1999 (28.05.99)</td><td>US</td></tr> <tr><td>60/137,127</td><td>28 May 1999 (28.05.99)</td><td>US</td></tr> <tr><td>60/137,131</td><td>28 May 1999 (28.05.99)</td><td>US</td></tr> <tr><td>60/141,448</td><td>29 June 1999 (29.06.99)</td><td>US</td></tr> <tr><td>60/156,653</td><td>29 September 1999 (29.09.99)</td><td>US</td></tr> <tr><td>60/156,633</td><td>29 September 1999 (29.09.99)</td><td>US</td></tr> <tr><td>60/156,555</td><td>29 September 1999 (29.09.99)</td><td>US</td></tr> <tr><td>60/156,634</td><td>29 September 1999 (29.09.99)</td><td>US</td></tr> <tr><td>60/157,280</td><td>1 October 1999 (01.10.99)</td><td>US</td></tr> <tr><td>60/157,294</td><td>1 October 1999 (01.10.99)</td><td>US</td></tr> <tr><td>60/157,281</td><td>1 October 1999 (01.10.99)</td><td>US</td></tr> <tr><td>60/157,293</td><td>1 October 1999 (01.10.99)</td><td>US</td></tr> <tr><td>60/157,282</td><td>1 October 1999 (01.10.99)</td><td>US</td></tr> <tr><td>09/417,044</td><td>12 October 1999 (12.10.99)</td><td>US</td></tr> <tr><td>09/416,760</td><td>12 October 1999 (12.10.99)</td><td>US</td></tr> </table>	60/109,213	20 November 1998 (20.11.98)	US	60/120,416	16 February 1999 (16.02.99)	US	60/121,852	26 February 1999 (26.02.99)	US	60/123,946	12 March 1999 (12.03.99)	US	60/123,949	12 March 1999 (12.03.99)	US	60/136,436	28 May 1999 (28.05.99)	US	60/136,437	28 May 1999 (28.05.99)	US	60/136,439	28 May 1999 (28.05.99)	US	60/136,567	28 May 1999 (28.05.99)	US	60/137,127	28 May 1999 (28.05.99)	US	60/137,131	28 May 1999 (28.05.99)	US	60/141,448	29 June 1999 (29.06.99)	US	60/156,653	29 September 1999 (29.09.99)	US	60/156,633	29 September 1999 (29.09.99)	US	60/156,555	29 September 1999 (29.09.99)	US	60/156,634	29 September 1999 (29.09.99)	US	60/157,280	1 October 1999 (01.10.99)	US	60/157,294	1 October 1999 (01.10.99)	US	60/157,281	1 October 1999 (01.10.99)	US	60/157,293	1 October 1999 (01.10.99)	US	60/157,282	1 October 1999 (01.10.99)	US	09/417,044	12 October 1999 (12.10.99)	US	09/416,760	12 October 1999 (12.10.99)	US	<p>(71) Applicant (for all designated States except US): ARENA PHARMACEUTICALS, INC. [US/US]; 6166 Nancy Ridge Drive, San Diego, CA 92121 (US).</p> <p>(72) Inventors; and (75) Inventors/Applicants (for US only): CHEN, Ruoping [CN/US]; 5296 Timber Branch Way, San Diego, CA 92130 (US). DANG, Huong, T. [US/US]; 5352 Oak Park Drive, San Diego, CA 92105 (US). LIAW, Chen, W. [US/US]; 7668 Salix Place, San Diego, CA 92129 (US). LIN, I-Lin [-/US]; 8291-7 Gold Coast Drive, San Diego, CA 92126 (US).</p> <p>(74) Agents: MILLER, Suzanne, E. et al.; Woodcock Washburn Kurtz Mackiewicz & Norris LLP, 46th floor, One Liberty Place, Philadelphia, PA 19103 (US).</p> <p>(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CR, CU, CZ, DE, DK, DM, 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, 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, ARIPO patent (GH, GM, KE, LS, MW, 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), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).</p> <p>Published <i>With international search report.</i></p> <p>(88) Date of publication of the international search report: 5 October 2000 (05.10.00)</p>
60/109,213	20 November 1998 (20.11.98)	US																																																																				
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<p>(54) Title: HUMAN ORPHAN G PROTEIN-COUPLED RECEPTORS</p>																																																																						
<p>(57) Abstract</p>																																																																						
<p>The invention disclosed in this patent document relates to transmembrane receptors, more particularly to endogenous, human orphan G protein-coupled receptors.</p>																																																																						

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EE	Estonia						

INTERNATIONAL SEARCH REPORT

International Application No PCT/US 99/23687
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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C12N15/12 C07K14/72
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
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		
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X	WILLIAMS S.: "Human DNA sequence from clone 417022 on chromosome 6q16.1-16.3." EMBL DATABASE ENTRY HS417022, 3 November 1998 (1998-11-03), XP002136831 page 1 -page 2 nts. 105786 - 107045	1-4
P,X	WO 99 24569 A (ONO PHARMACEUTICAL CO ;HAGA HISANORI (JP); NAKADE SHINJI (JP); FUK) 20 May 1999 (1999-05-20) SEQ.ID.3	1-4

Further documents are listed in the continuation of box C.

Patent family members are listed in annex.

- ° Special categories of cited documents :
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| <p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p> | <p>"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</p> <p>"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</p> <p>"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.</p> <p>"&" document member of the same patent family</p> |
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Date of the actual completion of the international search <div style="text-align: center; font-size: 1.2em;">14 July 2000</div>	Date of mailing of the international search report <div style="text-align: center; font-size: 1.2em;">02.08.00</div>
Name and mailing address of the ISA 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	Authorized officer <div style="text-align: center; font-size: 1.2em;">Mandl, B</div>

INTERNATIONAL SEARCH REPORT

International Application No PCT/US 99/23687

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	STADEL J. M. ET AL.: "Orphan G protein-coupled receptors: A neglected opportunity for pioneer drug discovery." TRENDS IN PHARMACOLOGICAL SCIENCES, vol. 18, no. 11, November 1997 (1997-11), pages 430-437, XP002073279 ISSN: 0165-6147 the whole document ---	1-4
E	WO 00 23588 A (WEICH NADINE S ;GLUCKSMANN MARIA ALEXANDRA (US); MILLENNIUM PHARM) 27 April 2000 (2000-04-27) SEQ.IDs. 5 and 6 ---	5-8
P,X	MUZNY D. ET AL.: "Homo sapiens chromosome 2p13.3, clone RPC111-433J6 - sequencing in progress - 100 unordered pieces." EMBL DATABASE ACCESSION NUMBER AC006087, 7 December 1998 (1998-12-07), XP002136323 nts. 133160-134279 ---	5
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X	O'DOWD B. F. ET AL.: "DISCOVERY OF THREE NOVEL G-PROTEIN-COUPLED RECEPTOR GENES" GENOMICS, vol. 47, no. 2, 15 January 1998 (1998-01-15), pages 310-313, XP000863786 ISSN: 0888-7543 the whole document ---	29-32
P,X	WO 99 46378 A (MATSUMOTO MITSUYUKI ;SAITO TETSU (JP); SUGIMOTO TORU (JP); TAKASAK) 16 September 1999 (1999-09-16) SEQ.ID.1, SEQ.ID.3, SEQ.ID.5 ---	29-32, 37-40, 49-52
X	STRAUSBERG R.: "National Cancer Institute, Cancer Genome Anatomy Project." EMBL DATABASE ACCESSION NUMBER AI090920, 19 August 1998 (1998-08-19), XP002142586 abstract ---	33
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INTERNATIONAL SEARCH REPORT

 International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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P,X	EP 0 913 471 A (SMITHKLINE BEECHAM CORP) 6 May 1999 (1999-05-06) the whole document	33-36
E	WO 99 55733 A (SMITHKLINE BEECHAM CORP) 4 November 1999 (1999-11-04) the whole document	37-40
X	MATSUOKA I. ET AL.: "Identification of novel members of G-protein coupled receptor subfamily" BIOCHEMICAL AND BIOPHYSICAL RESEARCH COMMUNICATIONS, vol. 194, no. 1, 15 July 1993 (1993-07-15), pages 504-511, XP002102959 ISSN: 0006-291X the whole document	41-44
X	HILLIER L. ET AL.: "Generation and analysis of 280000 human expressed sequence tags." EMBL DATABASE ACCESSION NUMBER H67224, 21 October 1995 (1995-10-21), XP002142587 abstract	41
X	STRAUSBERG R.: "National Cancer Institute, Cancer Genome Project." EMBL DATABASE ACCESSION NUMBER AI131555, 23 September 1998 (1998-09-23), XP002142588 abstract	41
P,X	WO 99 24463 A (INCYTE PHARMA INC ;MATHUR PREETE (US); REDDY ROOPA (US); AU YOUNG) 20 May 1999 (1999-05-20) SEQ.IDs. 16 and 17	41-44
P,X	EP 0 899 332 A (SMITHKLINE BEECHAM CORP) 3 March 1999 (1999-03-03) the whole document	41-44
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E	WO 99 52945 A (MILLENNIUM PHARM INC) 21 October 1999 (1999-10-21) figure 2; example 2	41-44
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INTERNATIONAL SEARCH REPORT

Inte. onal Application No
PCT/US 99/23687

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WENG ET AL.: "A DNA damage and stress inducible G protein-coupled receptor blocks cells in G2/M" PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF USA, vol. 95, 1 October 1998 (1998-10-01), pages 12334-12339, XP002095309 ISSN: 0027-8424 the whole document ---	45-48
X	WO 98 31810 A (SCHERING CORP) 23 July 1998 (1998-07-23) SEQ.IDs. 7 and 8 ---	45-48
X	EP 0 860 502 A (SMITHKLINE BEECHAM CORP) 26 August 1998 (1998-08-26) the whole document ---	45-48
P,X	WO 99 25830 A (UNIV CALIFORNIA) 27 May 1999 (1999-05-27) the whole document ---	45-48
E	WO 99 55734 A (SMITHKLINE BEECHAM CORP) 4 November 1999 (1999-11-04) the whole document ---	49-52
E	WO 00 12707 A (MILLENNIUM PHARM INC) 9 March 2000 (2000-03-09) the whole document ---	49-52
X	STRAUSBERG R. : "National Cancer Institute, Cancer Genome Anatomy Project." EMBL DATABASE ACCESSION NUMBER AA804531, 16 February 1998 (1998-02-16), XP002142589 abstract ---	53
E	WO 00 11170 A (MILLENNIUM PHARM INC) 2 March 2000 (2000-03-02) the whole document ---	53-56
E	WO 00 11166 A (MILLENNIUM PHARM INC) 2 March 2000 (2000-03-02) the whole document ---	57-60
X	WO 98 50549 A (HUMAN GENOME SCIENCES INC ;LI YI (US); RUBEN STEVEN M (US)) 12 November 1998 (1998-11-12) SEQ.IDs. 1 and 2 ---	61-64
E	WO 00 28028 A (GU WEI ;WEICH NADINE S (US); GLUCKSMANN MARIA ALEXANDRA (US); MILL) 18 May 2000 (2000-05-18) SEQ.IDs. 1 and 2 ---	61-64
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INTERNATIONAL SEARCH REPORT

International Application No
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, X	WO 99 42484 A (SMITHKLINE BEECHAM CORP) 26 August 1999 (1999-08-26) SEQ.IDs. 1 and 2 ---	65-68
X	WO 97 20045 A (COR THERAPEUTICS INC) 5 June 1997 (1997-06-05) the whole document ---	69-72
X	WO 97 24929 A (HUMAN GENOME SCIENCES INC) 17 July 1997 (1997-07-17) the whole document ---	69-72
E	WO 00 11015 A (ALPHAGENE INC) 2 March 2000 (2000-03-02) SEQ.IDs. 25 and 26 -----	73-76

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 99/23687

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.:

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: 1-4

Human G protein-coupled receptor as characterized by SEQ.ID.2, a cDNA encoding said receptor as characterized by SEQ.ID.1, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

2. Claims: 5-8

Human G protein-coupled receptor as characterized by SEQ.ID.4, a cDNA encoding said receptor as characterized by SEQ.ID.3, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

3. Claims: 9-12

Human G protein-coupled receptor as characterized by SEQ.ID.6, a cDNA encoding said receptor as characterized by SEQ.ID.5, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

4. Claims: 13-16

Human G protein-coupled receptor as characterized by SEQ.ID.8, a cDNA encoding said receptor as characterized by SEQ.ID.7, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

5. Claims: 17-20

Human G protein-coupled receptor as characterized by SEQ.ID.10, a cDNA encoding said receptor as characterized by SEQ.ID.9, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

6. Claims: 21-24

Human G protein-coupled receptor as characterized by SEQ.ID.12, a cDNA encoding said receptor as characterized by SEQ.ID.11, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

7. Claims: 25-28

Human G protein-coupled receptor as characterized by SEQ.ID.14, a cDNA encoding said receptor as characterized by

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

SEQ.ID.13, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

8. Claims: 29-32

Human G protein-coupled receptor as characterized by SEQ.ID.16, a cDNA encoding said receptor as characterized by SEQ.ID.15, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

9. Claims: 33-36

Human G protein-coupled receptor as characterized by SEQ.ID.18, a cDNA encoding said receptor as characterized by SEQ.ID.17, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

10. Claims: 37-40

Human G protein-coupled receptor as characterized by SEQ.ID.20, a cDNA encoding said receptor as characterized by SEQ.ID.19, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

11. Claims: 41-44

Human G protein-coupled receptor as characterized by SEQ.ID.22, a cDNA encoding said receptor as characterized by SEQ.ID.21, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

12. Claims: 45-48

Human G protein-coupled receptor as characterized by SEQ.ID.24, a cDNA encoding said receptor as characterized by SEQ.ID.23, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

13. Claims: 49-52

Human G protein-coupled receptor as characterized by SEQ.ID.26, a cDNA encoding said receptor as characterized by SEQ.ID.25, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

14. Claims: 53-56

Human G protein-coupled receptor as characterized by

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

SEQ.ID.28, a cDNA encoding said receptor as characterized by SEQ.ID.27, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

15. Claims: 57-60

Human G protein-coupled receptor as characterized by SEQ.ID.30, a cDNA encoding said receptor as characterized by SEQ.ID.29, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

16. Claims: 61-64

Human G protein-coupled receptor as characterized by SEQ.ID.32, a cDNA encoding said receptor as characterized by SEQ.ID.31, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

17. Claims: 65-68

Human G protein-coupled receptor as characterized by SEQ.ID.34, a cDNA encoding said receptor as characterized by SEQ.ID.33, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

18. Claims: 69-72

Human G protein-coupled receptor as characterized by SEQ.ID.36, a cDNA encoding said receptor as characterized by SEQ.ID.35, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

19. Claims: 73-76

Human G protein-coupled receptor as characterized by SEQ.ID.38, a cDNA encoding said receptor as characterized by SEQ.ID.37, a plasmid comprising said cDNA, and a host cell comprising said plasmid.

INTERNATIONAL SEARCH REPORT

information on patent family members

International Application No PCT/US 99/23687

Patent document cited in search report	A	Publication date	Patent family member(s)	Publication date
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