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- (74) **Agents:** DELUCA, Mark et al.; Woodcock Washburn Kurtz Mackiewicz & Norris LLP, 46th Floor, One Liberty Place, Philadelphia, PA 19103 (US).
- (21) **International Application Number:** PCT/US01/14050
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- (71) **Applicant (for all designated States except US):** PHARMACIA & UPJOHN COMPANY [US/US]; 301 Henrietta Street, Kalamazoo, MI 49001 (US).
- (72) **Inventors; and**
- (75) **Inventors/Applicants (for US only):** PARODI, Luis, A. [US/US]; Grevgafan-24, S-115 43 Stockholm (SE). LIND, Peter [SE/SE]; Borjegatan 31C, S-751 29 Uppsala (SE). SEJLITZ, Torsten [SE/SE]; Sankt Eriksgatan 59, S-112 34 Stockholm (SE).
- (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).
- Declaration under Rule 4.17:**
— of inventorship (Rule 4.17(iv)) for US only
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- (88) **Date of publication of the international search report:**
22 August 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.*

(54) **Title:** G PROTEIN-COUPLED RECEPTORS

(57) **Abstract:** The present invention provides a gene encoding a G protein-coupled receptor termed nGPCR-x; constructs and recombinant host cells incorporating the genes; the nGPCR-x polypeptides encoded by the gene; antibodies to the nGPCR-x polypeptides; and methods of making and using all of the foregoing.



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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/14050

| | | | | | |
|-------------------------------------|-----------|------------|-----------|-----------|-----------|
| A. CLASSIFICATION OF SUBJECT MATTER | | | | | |
| IPC 7 | C12N15/12 | C07K14/705 | C07K14/72 | C12N15/63 | C12N5/10 |
| | C12P21/00 | C07K16/28 | G01N33/68 | C12Q1/68 | A61K38/17 |

According to International Patent Classification (IPC) or to both national classification and IPC

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| B. FIELDS SEARCHED |
| Minimum documentation searched (classification system followed by classification symbols) |
| IPC 7 C07K |

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

| |
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| Electronic data base consulted during the international search (name of data base and, where practical, search terms used) |
| SEQUENCE SEARCH, 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_HTG [Online] EMBL; 1 September 1999 (1999-09-01) BIRREN ET AL.: "Homo sapiens chromosome 11, clone 107_B 13" retrieved from EBI, accession no. AC009642 Database accession no. AC009642 XP002190937 the whole document | 1-6 |
| A | --- EP 0 867 508 A (SMITHKLINE BEECHAM CORP) 30 September 1998 (1998-09-30) abstract; claims page 2, line 12 -page 3, line 24 --- -/-- | 1-63 |

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 | "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 |
| "E" earlier document but published on or after the international filing date | "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 |
| "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) | "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. |
| "O" document referring to an oral disclosure, use, exhibition or other means | "&" document member of the same patent family |
| "P" document published prior to the international filing date but later than the priority date claimed | |

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| Date of the actual completion of the international search | Date of mailing of the international search report |
| 21 February 2002 | 13. 06. 02 |
| 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 CEDER O. |

INTERNATIONAL SEARCH REPORT

International Application No
PCT/US 01/14050

| C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT | | |
|--|--|-----------------------|
| Category ° | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
| A | <p>WO 99 37679 A (ROBISON KEITH ;GLUCKSMANN M ALEXANDRA (US); MILLENNIUM PHARM INC () 29 July 1999 (1999-07-29) abstract; claims page 1, line 1 -page 3, line 2 -----</p> | 1-63 |
| P,X | <p>WO 01 27158 A (FUCHS TANIA ;GLUSMAN GUSTAVO (IL); LANCET DORON (IL); YEDA RES & D) 19 April 2001 (2001-04-19) Seq Id Nos 294 1226 abstract; claims ---</p> | 1-63 |
| E | <p>WO 01 57085 A (INCYTE GENOMICS INC ;YUE HENRY (US); AU YOUNG JANICE (US); BAUGHN) 9 August 2001 (2001-08-09) Seq Id Nos 2, 23 abstract; claims -----</p> | 1-63 |

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/14050

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:
see FURTHER INFORMATION sheet PCT/ISA/210

2. Claims Nos.: 50, 53, 57
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.:

1-63 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.1

Although claim 46 is 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.

Continuation of Box I.1

Rule 39.1(iv) PCT - Method for treatment of the human or animal body by therapy

Continuation of Box I.2

Claims Nos.: 50, 53, 57

Claims 50, 53 and 57 refers to "a compound identified by the method of claim" 47, 51 and 54 respectively, without giving a true technical characterization. Moreover, no such compounds are specifically defined in the description. It is only indicated that "the term compound means any identifiable chemical or molecule, including, but not limited to, small molecule, peptide, protein, sugar, nucleotide, or nucleic acid, and such compound can be natural or synthetic" (page 7 lines 29-31). In consequence the scope of said claims is ambiguous and vague, and their subject-matter is not sufficiently disclosed and supported (Art. 5 and 6 PCT). No search can be carried out for such claims whose wording is, in fact, a mere recitation of the results to be achieved.

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: 1-63 all partially

An isolated nucleic acid molecule comprising a nucleotide sequence that encodes a polypeptide comprising an amino acid sequence homologous to Seq Id No 68, said nucleic acid molecule encoding at least a portion of nGPCR-x, the isolated nucleic acid molecule comprising a sequence homologous to Seq Id No 1, an expression vector comprising said nucleic acid molecule, a host cell transformed with said vector, an isolated polypeptide encoded by said nucleic acids and methods using them.

2. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 2 and 69.

3. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 3 and 70.

4. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 4 and 71.

5. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 5 and 72.

6. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 6 and 73.

7. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 7 and 74.

8. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 8 and 75.

9. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 9 and 76.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

10. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 10 and 77.

11. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 11, 78 and 135.

12. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 12 and 79.

13. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 13 and 80.

14. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 14 and 81.

15. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 15 and 82.

16. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 16 and 83.

17. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 17 and 84.

18. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 18 and 85.

19. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 19 and 86.

20. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 20 and 87.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

21. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 21 and 88.

22. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 22 and 89.

23. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 23 and 90.

24. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 24 and 91.

25. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 25 and 92.

26. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 26 and 93.

27. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 27 and 94.

28. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 28 and 95.

29. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 29 and 96.

30. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 30 and 97.

31. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 31 and 98.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

32. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 32 and 99.

33. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 33 and 100.

34. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 34 and 101.

35. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 35 and 102.

36. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 36 and 103.

37. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 37 and 104.

38. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 38 and 105.

39. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 39 and 106.

40. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 40 and 107.

41. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 41 and 108.

42. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 42 and 109.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

43. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 43 and 110.

44. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 44 and 111.

45. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 45 and 112.

46. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 46 and 113.

47. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 47 and 114.

48. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 48 and 115.

49. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 49 and 116.

50. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 50 and 117.

51. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 51 and 118.

52. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 52 and 119.

53. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 53 and 120.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

54. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 54, 121 and 136.

55. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 55 and 122.

56. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 56 and 123.

57. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 57 and 124.

58. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 58 and 125.

59. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 59 and 126.

60. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 60 and 127.

61. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 61 and 128.

62. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 62 and 129.

63. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 63 and 130.

64. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 64 and 131.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

65. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 65 and 132.

66. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 66 and 133.

67. Claims: 1-63 all partially

Idem as invention 1 but limited to Seq Id Nos 67 and 134.

INTERNATIONAL SEARCH REPORT
 Information on patent family members

International Application No
PCT/US 01/14050

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