0 4 JUN 2002
200203181

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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
21 June 2001 (21.06.2001)

PCT

(10) International Publication Number
WO 01/44283 A3

(51) International Patent Classification[7]: C07K 14/705, C12N 15/12, 5/10, 15/86, 15/11, C12Q 1/68, A61K 38/17, C07K 16/28, G01N 33/53, A61P 25/00

(21) International Application Number: PCT/US00/33829

(22) International Filing Date:
14 December 2000 (14.12.2000)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
09/460,602 14 December 1999 (14.12.1999) US

(63) Related by continuation (CON) or continuation-in-part (CIP) to earlier application:
US 09/460,602 (CIP)
Filed on 14 December 1999 (14.12.1999)

(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)*: **ROBERDS, Steven, L.** [US/US]; 4844 Hickory Lane, Mattawan, MI 49071 (US). **KARNOVSKY, Alla, M.** [US/US]; 2943 Bramble Drive, Kalamazoo, MI 49009 (US). **RUBLE, Cara, L.** [US/US]; 56881 CR 653, Paw Paw, MI (US). **BENJAMIN, Christopher, W.** [US/US]; 551 South Second Street, Kalamazoo, MI 49009 (US).

(74) Agents: **DELUCA, Mark** et al.; Woodcock Washburn Kurtz Mackiewicz & Norris LLP, One Liberty Place, 46th Floor, Philadelphia, PA 19103 (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 February 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.

162162

ACTION

WO 01/44283 A3

(54) Title: HUMAN ION CHANNELS

(57) Abstract: The present invention provides novel ion channel polypeptides and polynucleotides which identify and encode them. In addition, the invention provides expression vectors, host cells and methods for their production. The invention also provides methods for the identification of ion channel agonists/antagonists, useful for the treatment of human diseases and conditions.