

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
7 August 2008 (07.08.2008)

PCT

(10) International Publication Number
WO 2008/092942 A3

(51) International Patent Classification:
C07D 401/04 (2006.01) A61K 31/4439 (2006.01)
C07D 405/14 (2006.01) A61P 11/00 (2006.01)

(74) Common Representative: NeuroSearch A/S; Patent Department, 93 Pederstrupvej, DK-2750 Ballerup (DK).

(21) International Application Number:
PCT/EP2008/051233

(22) International Filing Date: 1 February 2008 (01.02.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
PA 2007 00186 2 February 2007 (02.02.2007) DK
60/899,383 5 February 2007 (05.02.2007) US

(71) Applicant (for all designated States except US): **NeuroSearch A/S** [DK/DK]; 93 Pederstrupvej, DK-2750 Ballerup (DK).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ERIKSEN, Birgitte, L.** [DK/DK]; c/o NeuroSearch A/S, 93 Pederstrupvej, DK-2750 Ballerup (DK). **SØRENSEN, Ulrik, Svane** [DK/DK]; c/o NeuroSearch A/S, 93 Pederstrupvej, DK-2750 Ballerup (DK). **HOUGAARD, Charlotte** [DK/DK]; c/o NeuroSearch A/S, 93 Pederstrupvej, DK-2750 Ballerup (DK). **TEUBER, Lene** [DK/DK]; 53 Anemonevej, DK-3500 Vaerløse (DK). **PETERS, Dan** [SE/DK]; c/o NeuroSearch A/S, 93 Pederstrupvej, DK-2750 Ballerup (DK). **JOHANSEN, Tina, Holm** [DK/DK]; 43 Erantishaven, DK-2765 Smørum (DK). **CHRISTOPHERSEN, PaUe** [DK/DK]; c/o NeuroSearch A/S, 93 Pederstrupvej, DK-2750 Ballerup (DK).

(81) Designated States (unless otherwise indicated, for every kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FT, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

(84) Designated States (unless otherwise indicated, for every kind of regional protection available): ARIPO (BW, GH, GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, PL, PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Declaration under Rule 4.17:

— as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(U))

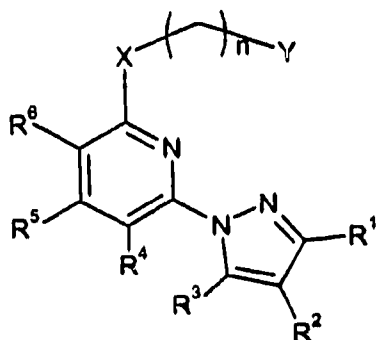
Published:

— with international search report
— before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments

(88) Date of publication of the international search report:

9 October 2008

(54) Title: PYRIDINYL-PYRAZOLE DERIVATIVES AND THEIR USE AS POTASSIUM CHANNEL MODULATORS



(I)

(57) Abstract: This invention relates to novel pyridinyl-pyrazole derivatives and their use as potassium channel modulating agents. Moreover the invention is directed to pharmaceutical compositions useful for the treatment or alleviation of diseases or disorders associated with the activity of potassium channels.

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2008/051233

A. CLASSIFICATION OF SUBJECT MATTER

INV. C07D401/04 C07D405/14 A61K31/4439 A61P11/00

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)
C07D

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)

EPO-Internal, CHEM ABS Data, BEILSTEIN Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document with indication where appropriate of the relevant passages	Relevant to claim No
X	US 6 169 086 B1 (EJIMA AKIO [JP] ET AL) 2 January 2001 (2001-01-02) examples 12-2, 26-3 -----	1-8
X	WO 98/40379 A (DU PONT [US]; SELBY THOMAS P [US]) 17 September 1998 (1998-09-17) compounds 1, 3 -----	1-8
X	WO 03/022843 A (BASF AG [DE]; HOFMANN MICHAEL [DE]; PARRA RAPADO LILIANA [DE]; DEYN WO) 20 March 2003 (2003-03-20) page 35: 4-cyano-2-methyl thio-6-(3-trifluoromethyl- 1H-pyrazol-1-yl)pyridine ----- -/-	1-8

☒ Further documents are listed in the continuation of Box C

☒ See patent family 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

"V" 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

"V" 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

11 August 2008

Date of mailing of the international search report

25/08/2008

Name and mailing address of the ISA/

European Patent Office P B 5818 Patenllaan 2
NL - 2280 HV Rijswijk
Tel (+31-70) 340-2040 Tx 31 651 epo nl
Fax (+31-70) 340-3016

Authorized officer

Bakboord, Joan

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2008/051233

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 2006/000358 A (BASF AG [DE] ; RHEINHEIMER JOACHIM [DE] ; SCHIEWECK FRANK [DE] ; GROTE TH) 5 January 2006 (2006-01-05) compounds 1-1 , 1-7 , 1-11 , 1-14 , 1-16 -----	1-8
X	JP 2005 213186 A (FUJI PHOTO FILM CO LTD) 11 August 2005 (2005-08-11) compounds A-2 , A-5 , A-22 , A-28 , A-29 , A-30 -----	1-8
X	JP 2005 289009 A (FUJI PHOTO FILM CO LTD) 20 October 2005 (2005-10-20) compounds A-31 , A-32 -----	1-8
X	US 6 107 253 A (HAMPRECHT GERHARD [DE] ET AL) 22 August 2000 (2000-08-22) example 4 -----	1-8
X	US 5 750 705 A (HAMPRECHT GERHARD [DE] ET AL) 12 May 1998 (1998-05-12) compound I V.2 -----	1-8
X	EP 1 101 764 A (BASF AG [DE]) 23 May 2001 (2001-05-23) claim 6: 2-(3-tri f luoromethyl phenoxy)-6-(4'-tri f luo romethyl pyrazol-r-yl)-4-methyl pyridi ne -----	1-8
X	US 5 167 691 A (MARAVETZ LESTER L [US]) 1 December 1992 (1992-12-01) example 4D -----	1-8
X	wo 2004/009597 A (SMITHKLINE BEECHAM CORP [US] ; DICKERSON SCOTT HOWARD [US] ; GARRIDO DUL) 29 January 2004 (2004-01-29) example Aa -----	1-8
X	wo 2004/013129 A (BAYER CROPSCIENCE GMBH [DE] ; HOFFMANN MICHAEL GERHARD [DE] ; HELMKE HEN) 12 February 2004 (2004-02-12) table 1 -----	1-8 I
X	PEAT A J ET AL: "Novel pyrazol opyrimi di ne deri vati ves as GSK-3 i nhi bi tors" BIOORGANIC & MEDICINAL CHEMISTRY LETTERS, OXFORD, GB, vol . 14, no. 9, 3 May 2004 (2004-05-03) , pages 2121-2125 , XP002329017 ISSN: 0960-894X compound 11 -----	1-8
A	wo 2006/097441 A (NEUROSEARCH AS [DK] ; ERIKSEN BIRGITTE L [DK] ; TEUBER LENE [DK] ; HOUGAA) 21 September 2006 (2006-09-21) cl aims 1,17 -----	1-16

V -

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2008/051233

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, A	WO 2007/098386 A (JANSSEN PHARMACEUTICA NV [BE]; ZHANG XUQING [US]; SUI ZHIHUA [US]) 30 August 2007 (2007-08-30) claims 1,5 -----	1-16
P, A	WO 2007/071632 A (NEUROSEARCH AS [DK]; ERIKSEN BIRGITTE L [DK]; SOERENSEN ULRIK SVANE [D]) 28 June 2007 (2007-06-28) claims 1,10 -----	1-16

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2008/051233

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 6169086	BI	02-01-2001	NONE
WO 9840379	A	17-09-1998	AU 725548 B2 12-10-2000 AU 6863898 A 29-09-1998 BR 9815453 A 23-10-2001 CA 2280515 AI 17-09-1998 EP 0970072 AI 12-01-2000
WO 03022843	A	20-03-2003	AT 291578 T 15-04-2005 CA 2459359 AI 20-03-2003 EP 1427725 AI 16-06-2004 US 2004235667 AI 25-11-2004
WO 2006000358	A	05-01-2006	AR 049832 AI 06-09-2006 BR PI0512306 A 26-02-2008 CN 1972922 A 30-05-2007 EP 1761516 AI 14-03-2007 JP 2008503522 T 07-02-2008 US 2007259919 AI 08-11-2007 UY 28985 AI 31-01-2006
OP 2005213186	A	11-08-2005	NONE
JP 2005289009	A	20-10-2005	NONE
US 6107253	A	22-08-2000	AU 6742996 A 12-03-1997 CA 2226765 AI 27-02-1997 DE 19530606 AI 27-02-1997 WO 9707114 AI 27-02-1997 EP 0846113 AI 10-06-1998 JP 11511155 T 28-09-1999
US 5750705	A	12-05-1998	AT 207467 T 15-11-2001 CA 2183178 AI 22-02-1997 DE 19530605 AI 27-02-1997 EP 0759429 AI 26-02-1997 JP 9132566 A 20-05-1997
EP 1101764	A	23-05-2001	AT 252573 T 15-11-2003 AU 7167900 A 24-05-2001 CA 2326020 AI 17-05-2001 DE 60006053 DI 27-11-2003 DE 60006053 T2 01-07-2004
US 5167691	A	01-12-1992	NONE
WO 2004009597	A	29-01-2004	AU 2003254053 AI 09-02-2004 EP 1523314 A2 20-04-2005 JP 2006501200 T 12-01-2006
WO 2004013129	A	12-02-2004	AT 341546 T 15-10-2006 AU 2003281853 AI 23-02-2004 BR 0312915 A 12-07-2005 CA 2493749 AI 12-02-2004 CN 1671698 A 21-09-2005 DE 10234876 AI 05-02-2004 DK 1527067 T3 05-02-2007 EP 1527067 AI 04-05-2005

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2008/051233

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2004013129 A		ES 2273013 T3 HR 20050074 A2 JP 2006505513 T MX PA05000954 A UA 80149 C2 US 2004082475 A1	01-05-2007 31-03-2006 16-02-2006 16-05-2005 27-08-2007 29-04-2004
WO 2006097441 A	21-09-2006	AU 2006224605 A1 CA 2601527 A1 EP 1861388 A1	21-09-2006 21-09-2006 05-12-2007
WO 2007098386 A	30-08-2007	US 2007197566 A1	23-08-2007
WO 2007071632 A	28-06-2007	NONE	