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kind of national protection available): AE, AG, AL, AM,
AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ,
CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO,
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN,
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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, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD,
SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR,
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TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK,
EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV,
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TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW,
ML, MR, NE, SN, TD, TG).

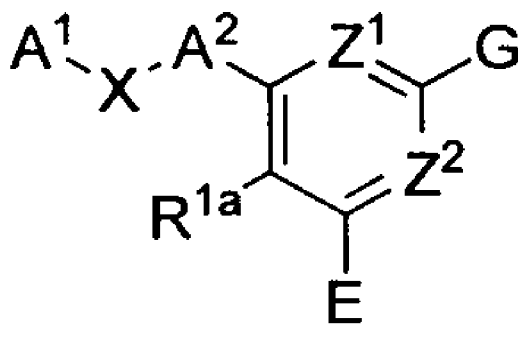
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(54) Title: PYRIDINE COMPOUNDS AND THE USES THEREOF



I

(57) Abstract: The invention relates to substituted pyridine compounds of Formula (I) and the pharmaceutically acceptable salts, prodrugs, and solvates thereof, wherein R^{1a}, A¹, A², E, G, Z¹, and Z² are defined as set forth in the specification. The invention is also directed to the use of compounds of Formula I to treat a disorder responsive to the blockade of sodium channels. Compounds of the present invention are especially useful for treating pain.

INTERNATIONAL SEARCH REPORT

International application No

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A. CLASSIFICATION OF SUBJECT MATTER
 INV. C07D213/30 C07D213/46 C07D213/74 C07D213/79 C07D213/81
 C07D213/84 C07D401/04 C07D401/12 C07D403/12 C07D403/14
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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 practicable, search terms used)

EPO-Internal, CHEM ABS Data, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

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X	WO 03/022276 A1 (EURO CELTIQUE SA [LU]; SHAO BIN [US]; GOEHRING R RICHARD [US]; VICTORY) 20 March 2003 (2003-03-20) page 1, line 4 - line 6 2-(4-(4-fluorophenoxy)phenyl)pyridine-4-carboxamide and 2-(4-phenoxyphenyl)pyridine-4-carboxamide claims 1, 2 ----- -/--	1-4, 20-26, 31-42, 45-54, 73-97



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 application or patent but published on or after the international filing date

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"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

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Name and mailing address of the ISA/

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Koch, Kristian

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International application No

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X	WO 2010/044411 A1 (KISSEI PHARMACEUTICAL [JP]; TAKIGAWA YASUSHI [JP]; SHIMIZU KAZUO [JP];) 22 April 2010 (2010-04-22) compounds 57, 72, 84, 85, 86	1,3,20, 23,26, 31,48, 49,73,74
X	WO 2009/148004 A1 (SANWA KAGAKU KENKYUSHO CO [JP]; YOSHIDA MASAHIRO [JP]; SAKAIRI MASAO []) 10 December 2009 (2009-12-10) compounds 29, 51	1-3,20, 26, 31-33, 40-42, 48,50, 73,74
X	EP 1 783 116 A1 (ASTELLAS PHARMA INC [JP]) 9 May 2007 (2007-05-09) compounds 7, 14-17, 25, 33, 40, 42, 44, 55, 59, 61-63 claim 1	1,3,20, 23,24, 26,31, 48,49, 73,74
X	WO 2010/079443 A1 (PFIZER LTD [GB]; ICAGEN INC [US]; BEAUDOIN SERGE [US]; LAUFERSWEILER M) 15 July 2010 (2010-07-15) page 133; compound 450 claim 24	1,3,20, 26,31, 73,74, 81-90
X	WO 2007/116230 A1 (PROSIDION LTD [GB]; FYFE MATTHEW COLIN THOR [GB]; GATTRELL WILLIAM [GB]) 18 October 2007 (2007-10-18) page 23; compounds 13, 18, 19, 24	1,4,20
X	WO 2004/013134 A2 (SMITHKLINE BEECHAM CORP [US]; DODIC NERINA [FR]; GELLIBERT FRANCOISE J) 12 February 2004 (2004-02-12) Intermediate 16; page 31 - page 32	1,3,21
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X	WO 2010/055114 A1 (BAYER CROPSCIENCE SA [FR]; BEIER CHRISTIAN [FR]; BENTING JUERGEN [DE];) 20 May 2010 (2010-05-20) compounds A1, C4, C5, C6 -----	1,2,4, 23,31, 34-36, 73,74
X	WO 03/022285 A1 (EURO CELTIQUE SA [LU]; SHAO BIN [US]; GOEHRING R RICHARD [US]) 20 March 2003 (2003-03-20) page 1, line 4 - line 6 example 1; compounds 5, 7 example 2; compound 11 table 1 claims 1, 2, 7 -----	1,3,20, 26, 31-36, 40,53, 54,73, 74, 76-94,97
X	WO 01/68612 A2 (COSENSYS INC [US]; HOGENKAMP DERK J [US]; NGUYEN PHONG [US]; SHAO BIN) 20 September 2001 (2001-09-20) paragraph [0001] paragraph [0180]; example 10 paragraph [0184]; example 11 example 18; compounds 13, 14, 15 table 3 claim 2 -----	1,3,20, 26, 31-36, 40,56, 73,74, 76-94,97
X	WO 03/048137 A1 (MERCK & CO INC [US]; MUNOZ BENITO [US]; STEARNS BRIAN [US]; VERNIER JE) 12 June 2003 (2003-06-12) page 1, line 9 - line 18 example 68 claim 1 -----	1,3,21, 26,33, 56,73, 76, 81-90,97
X	WO 2008/097835 A2 (BAYLOR COLLEGE MEDICINE [US]; UESUGI MOTONARI [US]; WAKIL SALIH J [US]) 14 August 2008 (2008-08-14) 4-(4'-methyl-(1,1'-biphenyl)-4-yl)-2-propylpyridine; page 6, paragraph 15 ----- -/--	1,4,21, 26,31, 33,56, 73,74

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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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X	<p>DAVID G. LONNON ET AL: "Programmed Helicity in Self-Assembled Hydrogen-Bonded Chains of Chiral Copper(II) Complexes", EUROPEAN JOURNAL OF INORGANIC CHEMISTRY, vol. 2006, no. 6, 1 March 2006 (2006-03-01), pages 1190-1197, XP55028030, ISSN: 1434-1948, DOI: 10.1002/ejic.200501063 N1,N1,N2-trimethyl-N2-((tetrahydro-2H-pyran-2-yl)oxy)phenyl)-2-pyrididiny)methyl-1,2-ethanediamine; page 1195, column 2, line 6 - line 7</p> <p>-----</p>	<p>1-3,8,9, 20,33, 56,73,74</p>
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X	EP 0 600 092 A1 (OTSUKA PHARMA CO LTD [JP]) 8 June 1994 (1994-06-08) compounds 20, 21, 38, 43, 60, 65-69, 112, 125 -----	1,3-6, 11-15, 21,33, 56,73,74
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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, 20-26, 31-54, 73-97(all partially)

Compounds of formula I wherein G = hydrogen, their pharmaceutical compositions and use as blockers of voltage-gated sodium channels.

2. claims: 1, 3, 4, 20-26, 31-56, 73-97(all partially)

Compounds of formula I wherein G = alkyl, their pharmaceutical compositions and use as blockers of voltage-gated sodium channels.

3. claims: 1-4, 20-26, 31-56, 73-97(all partially)

Compounds of formula I wherein G = cyano, their pharmaceutical compositions and use as blockers of voltage-gated sodium channels.

4. claims: 5-7, 57-63, 67, 68, 72(completely); 1-4, 20-26, 31-56, 73-97(partially)

Compounds of formula I wherein G = G-1, their pharmaceutical compositions and use as blockers of voltage-gated sodium channels.

5. claims: 8-10, 64-66(completely); 1-4, 20-26, 31-56, 73-97(partially)

Compounds of formula I wherein G = G-2, their pharmaceutical compositions and use as blockers of voltage-gated sodium channels.

6. claims: 11-13, 27(completely); 1-4, 20-26, 31-56, 73-97(partially)

Compounds of formula I wherein G = G-3, their pharmaceutical compositions and use as blockers of voltage-gated sodium channels.

7. claims: 14-16, 28-30, 69-71(completely); 1-4, 20-26, 31-56, 73-97(partially)

Compounds of formula I wherein G = G-4, their pharmaceutical compositions and use as blockers of voltage-gated sodium channels.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

8. claims: 17-19(completely); 1, 3, 4, 20-26, 31-56,
73-97(partially)

Compounds of formula I wherein G = G-5, their pharmaceutical compositions and use as blockers of voltage-gated sodium channels.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/IB2011/002172

Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 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 No. III Observations where unity of invention is lacking (Continuation of item 3 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 fees, this Authority did not invite payment of additional fees.

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 and, where applicable, the payment of a protest fee.
- The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- No protest accompanied the payment of additional search fees.