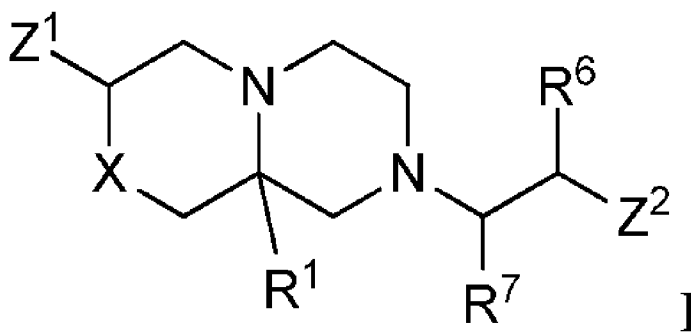




- (51) **International Patent Classification:**
A61K 31/5383 (2006.01) *C07D 491/04* (2006.01)
- (21) **International Application Number:**
PCT/US2014/015901
- (22) **International Filing Date:**
12 February 2014 (12.02.2014)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
61/765,913 18 February 2013 (18.02.2013) US
- (71) **Applicant:** MERCK SHARP & DOHME CORP.
[US/US]; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US).
- (72) **Inventors; and**
- (71) **Applicants (for NZ, US only):** PASTERNAK, Alexander [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). DE JESUS, Reynalda, Keh [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). DING, Fa-xiang [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). DONG, Shuzhi [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). FRIE, Jessica [US/US]; 770 Sumneytown Pike, West Point, PA 19486 (US). GU, Xin [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). JIANG, Jinlong [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). SHAHRIPOUR, Aurash [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). PIO, Barbara [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). TANG, Haifeng [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US). WALSH, Shawn [US/US]; 2000 Galloping Hill Road, Kenilworth, NJ 07033 (US).
- (74) **Common Representative:** MERCK SHARP & DOHME CORP.; 126 East Lincoln Avenue, Rahway, NJ 07065-0907 (US).
- (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, BN, 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, HR, HU, ID, IL, IN, IR, IS, JP, KE, KG, 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, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, 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, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, 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, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, KM, ML, MR, NE, SN, TD, TG).
- Declarations under Rule 4.17:**
- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
 - as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))
- Published:**
- with international search report (Art. 21(3))
- (88) **Date of publication of the international search report:**
26 November 2015

(54) **Title:** INHIBITORS OF THE RENAL OUTER MEDULLARY POTASSIUM CHANNEL



(57) **Abstract:** The present invention provides compounds of Formula(I) or a pharmaceutically acceptable salt thereof, which are inhibitors of the ROMK (Kir1.1) channel. The compounds may be used as diuretic and/or natriuretic agents and for the therapy and prophylaxis of medical conditions including cardiovascular diseases such as hypertension, heart failure, kidney disease, edema, and conditions associated with excessive salt and water retention.

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 14/15901

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61K 31/4985; A61K 31/497 (2014.01)

USPC - 514/252.11; 514/252.1; 514/252.13; 514/254.11

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(8): A61K 31/4985; A61K 31/497 (2014.01)

USPC: 514/252.11

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

USPC: 514/252.1; 514/252.13; 514/254.11

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

PatBase, Google Scholar, SureChem, PubWEST

ROMK, renal outer-medullary potassium channel, inhibitor, diuresis, natriuresis, hypertension, cardiovascular, heart disease, kidney disease, edema

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2010/0286123 A1 (PASTERNAK et al.) 11 November 2010 (11.11.2010) para [0102]-[0103], [0110], [0118], [0536], [0549], [0559], [0630], [0736], Table 1; para [0737], [0754], [0717]	1-18
Y	US 6,787,543 B2 (TAKE et al.) 07 September 2004 (07.09.2004) col 1, ln 10-27; col 1, ln 45-55; col 7, ln 15-40; col 46, ln 6-30; col 46, ln 49-67	1-18
Y	WO 2012/058134 A1 (PASTERNAK et al.) 03 May 2012 (03.05.2012) pg 198; pg 203-204, Table 1	10-11

☐

Further documents are listed in the continuation of Box C.

☐

* 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

"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

"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

Date of the actual completion of the international search

20 April 2014 (20.04.2014)

Date of mailing of the international search report

12 MAY 2014

Name and mailing address of the ISA/US

Mail Stop PCT, Attn: ISA/US, Commissioner for Patents
P.O. Box 1450, Alexandria, Virginia 22313-1450

Facsimile No. 571-273-3201

Authorized officer:

Lee W. Young

PCT Helpdesk: 571-272-4300
PCT OSP: 571-272-7774