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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, 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, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

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Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

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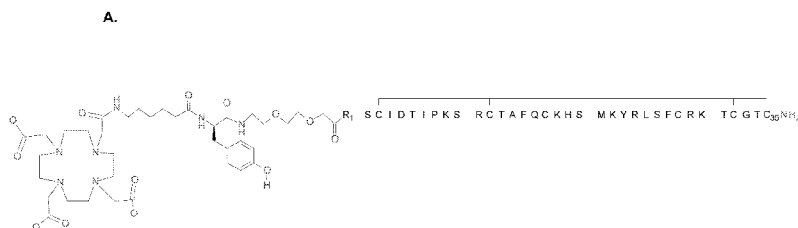
- with international search report (Art. 21(3))
- before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))
- with sequence listing part of description (Rule 5.2(a))

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

14 March 2013

(54) Title: SHK-BASED PHARMACEUTICAL COMPOSITIONS AND METHODS OF MANUFACTURING AND USING THE SAME

Figure 2



(57) Abstract: Disclosed herein are pharmaceutical compositions having the sequence Arg-Ser-Cys-Ile-Asp-Thr-Ile-Pro-Lys-Ser-Arg-Cys-Thr-Ala-Phe-Gln-Cys-Lys-His-Ser-Xaa-Lys-Tyr-Arg-Leu-Ser-Phe-Cys-Arg-Lys-Thr-Cys-Gly-Thr-Cys (SEQ ID NO:1). The disclosed compositions can include an acid or amide at the C-terminus of SEQ ID NO: 1 and the polypeptide can be attached to an organic or inorganic chemical entity that has an anionic charge. The polypeptide can be detectably labeled for diagnostic purposes. Methods of manufacturing and using the pharmaceutical compounds are also disclosed.

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2012/040857**A. CLASSIFICATION OF SUBJECT MATTER***A61K 38/16(2006.01)i, A61K 38/17(2006.01)i, A61P 17/00(2006.01)i*

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)

A61K 38/16; A61P 37/00; A61K 38/17

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

Korean utility models and applications for utility models

Japanese utility models and applications for utility models

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

eKOMPASS(KIPO internal) & Keywords: ShK polypeptide, chemical entity, 2-aminoethoxyethoxyacetyl linker, selective Kv1.3 blocker, DOTA-chelate, p-phospho-Tyr-AEEA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 2008-0221024 A1 (CHANDY, GEORGE K. et al.) 11 Sep. 2008	8-41,44,45,57-60
Y	See abstract, paragraphs [0095]~[0103], claims 1, 3-7, 9-21, 47-49	1-7,42,43,46,47
Y	ORCUTT, K. D., et al., Engineering an antibody with picomolar affinity to DOTA chelates of multiple radionuclides for pretargeted radioimmunotherapy and imaging. Nucl. Med. Biol. 38(2): 223-233 (Epub. 27 Oct. 2010)	1-7,42,43,46,47
A	See abstract, introduction	8-41,44,45,57-60
A	KALMAN, K, et al., ShK-Dap22, a potent Kv1.3-specific immunosuppressive polypeptide. J. Biol. Chem. 273(49): 32697-32707 (4 Dec. 1998) See abstract	1-47,57-60
A	PENNINGTON, M. W., et al., Engineering a stable and selective peptide blocker of the Kv1.3 channel in T lymphocytes. Mol. Pharmacol. 75(4): 762-773 (Epub. 2 Jan. 2009) See abstract, figures 4, 6	1-47,57-60



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

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of 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

24 JANUARY 2013 (24.01.2013)

Date of mailing of the international search report

25 JANUARY 2013 (25.01.2013)

Name and mailing address of the ISA/KR

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/040857

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 2010-108154 A2 (AMGEN INC.) 23 Sep. 2010 See the whole document	1-47, 57-60

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US2012/040857**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.: 48-56
because they relate to subject matter not required to be searched by this Authority, namely:
Claims 48-56 pertain to methods for treatment of the human body by surgery or therapy, as well as diagnostic methods, and thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the Regulations under the PCT, to search.
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:

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.:

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.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/US2012/040857

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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