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(88) Date of publication of the international search report:
13 July 2017

(54) Title: PEPTIDES FOR RENAL THERAPY

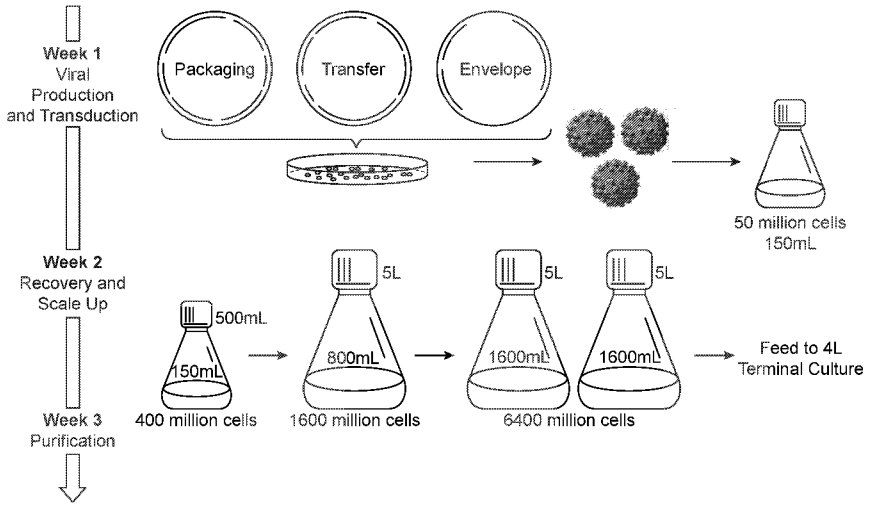


FIG. 1

(57) Abstract: The present disclosure provides compositions and methods for renal therapy. In various aspects, the present disclosure provides a composition comprising a knotted peptide, wherein upon administration to a subject the knotted peptide homes, targets, is directed to, accumulates in, migrates to, is retained by, and/or binds to renal tissue of the subject. In various aspects, the composition further comprises an active agent coupled to the knotted peptide. The composition, when administered to the subject, may induce protective preconditioning or acquired cytoresistance.

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INTERNATIONAL SEARCH REPORT

International application No.
PCT/US16/66007

A. CLASSIFICATION OF SUBJECT MATTER
IPC - A61K 38/17, 45/06; C07K 14/435, 14/47 (2017.01)
CPC - A61K 38/17, 45/06; C07K 14/435, 14/47

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)
See Search History document

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

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

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	(MOORE, SJ et al.) Engineering Agatoxin, a Cystine-Knot Peptide from Spider Venom, as a Molecular Probe for In Vivo Tumor Imaging. PLoS One. 03 April 2013; Vol. 8, No. 4; pages 1-11; abstract; page 5, column 1, paragraph 2; page 7, column 2, paragraph 2; page 9, column 1, paragraph 3; DOI: 10.1371/journal.pone.0060498	1
A	US 2009/0142266 A1 (RONJAT, M et al.) 04 June 2009; paragraph [0050]	3/1, 4/1, 5/1
A	WO 2013/078250 A2 (THE BOARD OF TRUSTEES OF THE LELAND STANFORD JUNIOR UNIVERSITY) 30 May 2013; abstract; page 4, lines 19-20	3/1, 4/1, 5/1

☐ 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 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	Date of mailing of the international search report
02 May 2017 (02.05.2017)	24 MAY 2017
Name and mailing address of the ISA/ Mail Stop PCT, Attn: ISA/US, Commissioner for Patents P.O. Box 1450, Alexandria, Virginia 22313-1450 Facsimile No. 571-273-8300	Authorized officer Shane Thomas PCT Helpdesk: 571-272-4300 PCT OSP: 571-272-7774

Form PCT/ISA/210 (second sheet) (January 2015)

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US16/66007

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.: 2, 3/2, 4/2, 5/2, 9-124
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:

-Please See Supplemental Page-*-

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 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.:
Groups I+, Claims 1, 3-8 and SEQ ID NO: 1

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/US16/66007

-***-Continued from Box No. III: Observations where unity of invention is lacking-***-

This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Groups I+, Claims 1-8 and SEQ ID NO: 1 are directed toward a composition comprising a knotted peptide.

The composition will be searched to the extent that the knotted peptide encompasses SEQ ID NO: 1 (first exemplary knotted peptide). Applicant is invited to elect additional knotted peptide(s), with specified SEQ ID NO: for each, to be searched. Additional knotted peptide sequence(s) will be searched upon the payment of additional fees. It is believed that claims 1, 2, 3 (in-part), 4 (in-part) and 5 (in-part) encompass this first named invention and thus these claims will be searched without fee to the extent that they encompass SEQ ID NO: 1 (knotted peptide). Applicants must specify the claims that encompass any additionally elected knotted peptide sequence(s). Applicants must further indicate, if applicable, the claims which encompass the first named invention, if different than what was indicated above for this group. Failure to clearly identify how any paid additional invention fees are to be applied to the "+" group(s) will result in only the first claimed invention to be searched/examined. An exemplary election would be a knotted peptide encompassing SEQ ID NO: 2 (first exemplary elected knotted peptide).

No technical features are shared between the knotted peptide sequences of Groups I+ and, accordingly, these groups lack unity a priori.

Groups I+ share the technical features including: a composition comprising: a knotted peptide, wherein upon administration to a subject the knotted peptide distributes, homes, targets, migrates to, accumulates in, binds to, is retained by, or is directed to renal tissue of the subject.

However, these shared technical features are previously disclosed by the article 'Engineering Agatoxin, a Cystine-Knot Peptide from Spider Venom, as a Molecular Probe for in Vivo Tumor Imaging' by Moore et al. (hereinafter 'Moore').

Moore discloses a composition (labeled knotted peptides in PBS (a composition); page 9, first column, third paragraph) comprising a knotted peptide (comprising a knottin; abstract, page 9, first column, third paragraph), wherein upon administration to a subject the knotted peptide accumulates in renal tissue of the subject (wherein upon administration to a subject the knotted peptide accumulates in renal tissue of the subject; page 5, first column, second paragraph; page 6, first column, first paragraph).

Since none of the special technical features of the Groups I+ inventions is found in more than one of the inventions, and since all of the shared technical features are previously disclosed by the Moore reference, unity of invention is lacking.