



(43) International Publication Date
4 December 2014 (04.12.2014)

WIPO | PCT

(10) International Publication Number
WO 2014/194267 A3

(51) International Patent Classification:

A01N 63/00 (2006.01) A61K 38/00 (2006.01)
A61K 31/00 (2006.01)

(21) International Application Number:

PCT/US2014/040352

(22) International Filing Date:

30 May 2014 (30.05.2014)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/829,133 30 May 2013 (30.05.2013) US

(71) Applicant: THE BOARD OF TRUSTEES OF THE LE-
LAND STANFORD JUNIOR UNIVERSITY [US/US];
1705 El Camino Real, Palo Alto, CA 94306-1106 (US).

(72) Inventors: GARCIA, Kenan, Christopher; 580 Kenwood
Drive, Menlo Park, CA 94025 (US). JANDA, Claudia,
Yvonne; 485 B Hawthorne Avenue, Palo Alto, CA 94301
(US).

(74) Agent: SHERWOOD, Pamela, J.; Bozicevic, Field &
Francis LLP, 1900 University Avenue, Suite 200, East
Palo Alto, CA 94303 (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:

— of inventorship (Rule 4.17(iv))

Published:

— with international search report (Art. 21(3))

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

26 February 2015

(54) Title: WNT PEPTIDE PHARMACOPHORE COMPOSITIONS AND METHODS OF USE THEREOF

(57) Abstract: Wnt compositions and methods for their use are provided. Compositions of the invention comprise fragments of wnt polypeptides having a desired biological activity, which fragments are referred to herein as "wnt peptide pharmacophores". These compositions and methods find particular use in determining binding to Wnt receptors; inhibiting Wnt signaling in a cell that expresses a Wnt receptor; in delivering a functional moiety to a cell that expresses a Wnt receptor; and as an immunogen for producing Wnt-specific antibodies.



WO 2014/194267 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/40352

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A01N 6/100; A61K 31/00, 38/00 (2014.01)

CPC - A61K 31/00, 38/00; G01N 33/5011; C07K 7/06, 7/08

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): A01N 6/100; A61K 31/00, 38/00 (2014.01)

CPC: A61K 31/00, 38/00; G01N 33/5011; C07K 7/06, 7/08; USPC: 514/1.1, 1; 420/400

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)

MicroPatent (US-G, US-A, EP-A, EP-B, WO, JP-bib, DE-C,B, DE-A, DE-T, DE-U, GB-A, FR-A); Google; Google Scholar; Dialog ProQuest; Entrez PubMed; 'isolated wnt peptide,' pharmacophore, 'Wnt-8,' deletion, substitution, 'sequence alignment,' 'circular peptide'

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y --- A	WO 2012/103360 A2 (GARCIA, KC et al.) August 02, 2012; abstract; paragraphs [0008], [0010], [0020], [0021], [0035], [0113]; figure 6	1, 2, 4/2 ----- 3, 4/3
Y --- A	WO 2012/004291 A1 (GARCIA-BENNETT, AE et al.) January 12, 2012; page 5, third paragraph	1, 2, 4/2 ----- 3, 4/3
A	US 2013/0022613 A1 (KRUMLAUF, R et al.) January 24, 2013; abstract	1-4
A	US 2010/0199362 A1 (MCMAHON, A et al.) August 05, 2010; abstract	1-4

☐ 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 November 2014 (20.11.2014)

Date of mailing of the international search report

10 DEC 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:

Shane Thomas

PCT Helpdesk: 571-272-4300

PCT OSP: 571-272-7774

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US14/40352

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.: 5-14
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 Box.

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.:

Claims 1, 2 (in-part), 3, 4 (in-part), 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

International application No.

PCT/US14/40352

-***-Continued from Box No. III: Lack of Unity of Invention:

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 1-4 are directed toward a composition comprising an isolated circular wnt peptide pharmacophore.

The composition comprising an isolated circular wnt peptide pharmacophore will be searched to the extent that the pharmacophore encompasses a polypeptide that consists of the amino acid sequence set forth in SEQ ID NO: 1 (wnt pharmacophore polypeptide amino acid sequence). It is believed that claims 1, 2 (in-part), 3 and 4 (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 (wnt pharmacophore polypeptide amino acid sequence). Applicants must specify the claims that encompass any additionally elected sequences. 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 pharmacophore encompassing a polypeptide that consists of the amino acid sequence set forth as SEQ ID NO: 2 (wnt pharmacophore amino acid sequence).

Groups I+ share the technical features including a composition comprising an isolated circular wnt peptide pharmacophore.

However, these shared technical features are previously disclosed by WO 2012/004291 A1 to Garcia-Bennett, et al. (hereinafter 'Garcia-Bennett'). Garcia-Bennett discloses a composition (pharmaceutical active ingredients in mesoporous silica; abstract) comprising an isolated circular wnt peptide pharmacophore (a circular peptide WNT mimetic (circular peptide, small molecule compound, or RNA aptamer); page 5, lines 28-29).

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 Garcia-Bennett reference, unity of invention is lacking.