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Published:

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

— with sequence listing part of description (Rule 5.2(a))

(88) Date of publication of the international search report:
30 December 2009

(54) Title: PEPTIDES THAT TARGET DORSAL ROOT GANGLION NEURONS

(57) Abstract: The present invention concerns methods and compositions that employ peptides that target dorsal root ganglion (DRG) neurons. In particular, the peptides are used to target therapeutic agents, such as proteins, liposomes, or viral particles comprising therapeutic polynucleotides, to one or more peripheral neuropathies or neuropathic pain, for example. In particular cases, the peripheral neuropathies or neuropathic pain is caused directly or indirectly by DRG neuronopathy.



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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/32643

A. CLASSIFICATION OF SUBJECT MATTER

IPC(8) - A61K 38/04 (2009.01)

USPC - 530/329

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 38/04 (2009.01)

USPC - 530/329

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)
 PubWEST(PGPB,USPT,USOC,EPAB,JPAB);DialogPRO (Engineering);PubMed;Google Scholar:dorsal root ganglion, target, home,virus, targeting, homing, biopanning, target\$, peptide, protein, adenovir\$, neuropathy, metabolic, hereditary, neoplasm, infectious, injury,viral, automimmune intrathecal\$, liposome.GenCore 6.3: SEQ ID No 1.

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2003/0119018 A1 (OMURA et al.) 26 Jun 2003 (26.06.2003) SEQ ID NO: 10096, aa 57-63	1-20
A,P	OI, et al. Isolation of Specific Peptides That Home to Dorsal Root Ganglion Neurons in Mice. Neurosci. Lett. Feb 2008 [Retrieved from the Internet http://www.pubmedcentral.nih.gov/picrender.fcgi?artid=2348187&blobtype=pdf]; 434(3):266-72	1-20
A	FEDERICI, et al. A Means for Targeting Therapeutics to Peripheral Nervous System Neurons with Axonal Damage. Neurosurgery. May 2007, 60(5):911-918	3-13 and 15-18



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

22 May 2009 (22.05.2009)

Date of mailing of the international search report

02 JUN 2009

Name and mailing address of the ISA/US

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/32643

Box No. 1 Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of:

a. type of material



a sequence listing



table(s) related to the sequence listing

b. format of material



on paper



in electronic form

c. time of filing/furnishing



contained in the international application as filed



filed together with the international application in electronic form



furnished subsequently to this Authority for the purposes of search

2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US 09/32643

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:

Group I, claims 1-20, drawn to an isolated peptide of SEQ ID NO:1 and methods of its use.

Group II, claims 1-20, drawn to an isolated peptide of SEQ ID NO:2 and methods of its use.

Group III, claims 1-20, drawn to an isolated peptide of SEQ ID NO:3 and methods of its use.

The inventions listed as Groups I-III do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The inventions listed as Groups I-III lack unity with one another because they do not have a shared special technical feature. The special technical feature of the inventions listed as Groups I-III is the polypeptides recited therein. The peptides do not have significant structural similarities with one another. Without significant structural similarities, the polypeptides lack a shared special technical feature. In the absence of a shared special technical feature, the inventions lack unity with one another. In addition, US 2003/0119018 A1 to Omura et al teaches a polypeptide comprising the claimed SEQ ID NO:1 (Omura et al., SEQ ID NO: 10096, aa 57-63). Groups I-III therefore lack unity under PCT Rule 13 because they do not share a same or corresponding special technical feature.

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.:
1-20 (limited to 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.