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(71) Applicant (for all designated States except US): **BOARD
OF REGENTS, THE UNIVERSITY OF TEXAS SYS-
TEM** [US/US]; 201 W. 7th St., Austin, TX 78748 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **GARRY, Mary**
[US/US]; 4215 Nashwood Lane, Dallas, TX 75244 (US).
BEZPROZVANNY, Ilya [US/US]; Apt. A, 3537 Nor-
mandy Av., Dallas, TX 75205 (US).

(74) Agent: **HIGHLANDER, Steven, L.**; Fulbright & Ja-
worski, LLP, 600 Congress Avenue, Suite 2400, Austin,
TX 78701 (US).

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MG, MK, MN, MW, MX, MZ, NA, NI, NO, NZ, OM, PG,
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ning of each regular issue of the PCT Gazette.

(54) Title: PEPTIDES OF CAV2.2 THAT INHIBIT PAIN

(57) Abstract: The present invention relates to peptides of CaV2.2 and their use in the treatment of pain. The sequence of the peptides is derived from the C-terminus of CaV2.2 and is believed to inhibit the interaction of CaV2.2 with Mint1-PDZ1. The invention is related to use of this peptide to treat pain and to use of this peptide in binding reaction with int-PDZ to screen for small molecules that can inhibit pain.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C07K14/47 A61K38/17 G01N33/68 C12N15/12		
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 7 C12N C07K		
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 practical, search terms used) EPO-Internal, EMBASE, BIOSIS, CHEM ABS Data, Sequence Search		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/42422 A (ARBOR VITA CORPORATION; LU, PETER; RABINOWITZ, JOSHUA, D; SCHWEIZER, J) 30 May 2002 (2002-05-30) page 64; claims 1-17; example 14; table 4	1-8, 17-29
X	WO 01/49312 A (UNIVERSITY OF UTAH RESEARCH FOUNDATION; COGNETIX, INC) 12 July 2001 (2001-07-12) abstract; claims 1-38; sequence 259	1,6,7, 17-28
X	US 2003/215860 A1 (GLUCKSMANN MARIA A ET AL) 20 November 2003 (2003-11-20) abstract; claims 1-19; sequence 50	1,6,7, 17-28
X	WO 02/07678 A (UNIVERSITY OF UTAH RESEARCH FOUNDATION; COGNETIX, INC) 31 January 2002 (2002-01-31) abstract; claims 1-42; sequences 45, 496	1,6,7, 17-28
	-/--	
☒ Further documents are listed in the continuation of box C. ☒ Patent family members are listed in 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 document 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 17 October 2005		Date of mailing of the international search report 28/10/2005
Name and mailing address of the ISA European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016		Authorized officer Gurdjian, D

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/07756 A (COGNETIX, INC; UNIVERSITY OF UTAH RESEARCH FOUNDATION) 31 January 2002 (2002-01-31) abstract; claims 1-21; sequence 57 -----	1,6, 17-28
X	WO 2004/000882 A (ARES TRADING S.A; FAGAN, RICHARD, JOSEPH; PHELPS, CHRISTOPHER, BENJAMI) 31 December 2003 (2003-12-31) abstract; claims 1-45; sequence 4 -----	1,6, 17-28
A	MAXIMOV ANTON ET AL: "Synaptic targeting of N-type calcium channels in hippocampal neurons." THE JOURNAL OF NEUROSCIENCE : THE OFFICIAL JOURNAL OF THE SOCIETY FOR NEUROSCIENCE. 15 AUG 2002, vol. 22, no. 16, 15 August 2002 (2002-08-15), pages 6939-6952, XP002349509 ISSN: 1529-2401 cited in the application -----	
A	BELL THOMAS J ET AL: "Cell-specific alternative splicing increases calcium channel current density in the pain pathway." NEURON. 8 JAN 2004, vol. 41, no. 1, 8 January 2004 (2004-01-08), pages 127-138, XP002349510 ISSN: 0896-6273 -----	
A	SAEGUSA HIRONAO ET AL: "Effects of ablation of N- and R-type Ca(2+) channels on pain transmission." NEUROSCIENCE RESEARCH. MAY 2002, vol. 43, no. 1, May 2002 (2002-05), pages 1-7, XP002349511 ISSN: 0168-0102 -----	

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Box No. I 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 and necessary to the claimed invention, 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
- ☒ In written format
- ☒ In computer readable form
- c. time of filing/furnishing
- ☒ contained in the international application as filed
- ☐ filed together with the international application in computer readable form
- ☒ furnished subsequently to this Authority for the purpose 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:

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Box 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:

Although claims 30-48 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
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 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.
- ☐ No protest accompanied the payment of additional search fees.

INTERNATIONAL SEARCH REPORT

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Patent document cited in search report		Publication date	Patent family member(s)		Publication date
WO 0242422	A	30-05-2002	AU	3933602 A	03-06-2002
			EP	1387692 A2	11-02-2004
WO 0149312	A	12-07-2001	AU	2740401 A	16-07-2001
			CA	2396529 A1	12-07-2001
			EP	1246635 A1	09-10-2002
			JP	2003533178 T	11-11-2003
US 2003215860	A1	20-11-2003	NONE		
WO 0207678	A	31-01-2002	AU	8294501 A	05-02-2002
			CA	2416544 A1	31-01-2002
			EP	1390054 A2	25-02-2004
			JP	2004537253 T	16-12-2004
WO 0207756	A	31-01-2002	AU	7896301 A	05-02-2002
WO 2004000882	A	31-12-2003	AU	2003236908 A1	06-01-2004