

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
7 December 2006 (07.12.2006)

PCT

(10) International Publication Number  
**WO 2006/129095 A3**

(51) International Patent Classification:

A61K 38/28 (2006.01) A61K 9/00 (2006.01)  
A61P 3/10 (2006.01) A61K 9/06 (2006.01)

(21) International Application Number:

PCT/GB2006/001997

(22) International Filing Date: 2 June 2006 (02.06.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

0511269.3 2 June 2005 (02.06.2005) GB

(71) Applicant (for all designated States except US): **CRE-  
ATIVE PEPTIDES SWEDEN AB** [SE/SE]; Fogdevreten  
2, SE-171 77 Stockholm (SE).

(71) Applicant (for SC only): **RUTHERFORD, Jodie**  
[GB/GB]; Frank B. dehn & Co., St Bride's House, 10  
Salisbury Square, London, EC4Y 8JD (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **WAHREN, John**  
[SE/SE]; Creative Peptides Sweden AB, Fogdevreten  
2, SE-171 77, Stockholm (SE). **CARLSSON, Anders**  
[SE/SE]; MediGelium AB, S:t Göransgatan 80, SE-112 38  
Stockholm (SE).

(74) Agent: **FRANK B. DEHN & CO.**; St. Bride House, 10  
Salisbury Square, London EC4Y 8JD (GB).

(81) Designated States (unless otherwise indicated, for every  
kind of national protection available): AE, AG, AL, AM,  
AT, AU, AZ, BA, BB, BG, BR, BW, BY, BZ, CA, CH, CN,  
CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, EG, ES, FI,  
GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE,  
KG, KM, KN, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV,  
LY, MA, MD, MG, MK, MN, MW, MX, MZ, NA, NG, NI,  
NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG,  
SK, SL, SM, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US,  
UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every  
kind of regional protection available): ARIPO (BW, GH,  
GM, KE, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM,  
ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM),  
European (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI,  
FR, GB, GR, HU, IE, IS, IT, LT, LU, LV, MC, NL, PL, PT,  
RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA,  
GN, GQ, GW, ML, MR, NE, SN, TD, TG).

**Published:**

- with international search report
- before the expiration of the time limit for amending the  
claims and to be republished in the event of receipt of  
amendments

(88) Date of publication of the international search report:  
10 May 2007

For two-letter codes and other abbreviations, refer to the "Guid-  
ance Notes on Codes and Abbreviations" appearing at the begin-  
ning of each regular issue of the PCT Gazette.

(54) Title: SUSTAINED RELEASE PREPARATIONS OF PRO-INSULIN C-PEPTIDE

(57) Abstract: The present invention provides a pharmaceutical composition for the sustained release of C-peptide said composition being in the form of a gel comprising C- peptide wherein gel formation is achieved by the adjustment of pH of the composition and/or by addition of divalent metal ions and wherein said composition does not include any other gel-forming agents. Methods for producing the composition, medical uses of the composition and products containing two or more gel compositions as a combined preparation are also encompassed.



WO 2006/129095 A3

**INTERNATIONAL SEARCH REPORT**

International application No  
PCT/GB2006/001997

**A. CLASSIFICATION OF SUBJECT MATTER**  
INV. A61K38/28      A61P3/10      A61K9/00      A61K9/06

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

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, WPI Data, BIOSIS, EMBASE

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P, Y	US 2006/025524 A1 (SCHNEIDER JOEL P [US] ET AL) 2 February 2006 (2006-02-02)  paragraphs [0006], [0007], [0022], [0023]	1, 4-6, 8, 9, 15, 16, 21-26
Y	WO 02/15937 A2 (SANOL ARZNEI SCHWARZ GMBH [DE]; RIMPLER STEPHAN [DE]; GRAPATIN SABINE) 28 February 2002 (2002-02-28) page 3, lines 15-24; claims 1-21 page 14, line 15 page 16, lines 14-17	1, 8, 10, 15, 16, 21-26
	----- -/-- -----	

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 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.
- \*Z\* document member of the same patent family

Date of the actual completion of the international search

15 February 2007

Date of mailing of the international search report

16/03/2007

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

Greif, Gabriela

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/GB2006/001997

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 3 869 549 A (GELLER LEO) 4 March 1975 (1975-03-04) claims 1-17 column 1, lines 54-63 column 2, lines 6-41 column 5, lines 28-39 -----	1-26
Y	JOHANSSON B-L ET AL: "Beneficial effects of C-peptide on incipient nephropathy and neuropathy in patients with Type 1 diabetes mellitus" DIABETIC MEDICINE, JOHN WILEY & SONS, LTD, GB, vol. 17, no. 3, March 2000 (2000-03), pages 181-189, XP002207348 ISSN: 0742-3071 the whole document -----	1-26
Y	US 2003/072803 A1 (GOLDENBERG MERRILL SEYMOUR [US] ET AL) 17 April 2003 (2003-04-17) paragraphs [0019], [0020], [0026], [0027], [0041], [0042], [0044]; claims 1,4,6,17 -----	1-26
Y	WO 02/38129 A2 (CREATIVE PEPTIDES SWEDEN AB [SE]; GARDNER REBECCA [GB]; MOHR DETLEF [D]) 16 May 2002 (2002-05-16) cited in the application the whole document -----	1-26
Y	WONG GEORGE K ET AL: "Formulation and sterilization of a sustained release delivery system for a gel forming peptide" PHARMACEUTICAL RESEARCH (NEW YORK), vol. 11, no. 10 SUPPL., 1994, page S312, XP009079051 & NINTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF PHARMACEUTICAL SCIENTISTS; SAN DIEGO, CALIFORNIA, USA; NOVEMBER 6-10, 1994 ISSN: 0724-8741 abstract -----	1-26
	----- -/--	

## INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/001997

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WONG GEORGE K ET AL: "Measurement of surface activities and preformulation studies on a gel forming peptide" PHARMACEUTICAL RESEARCH (NEW YORK), vol. 11, no. 10 SUPPL., 1994, page S226, XP009079052 & NINTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF PHARMACEUTICAL SCIENTISTS; SAN DIEGO, CALIFORNIA, USA; NOVEMBER 6-10, 1994 ISSN: 0724-8741 abstract	1-26
Y	GRAY RONDA A ET AL: "Dissolution Studies On The Sustained-Release Characteristics Of A Gel-Forming Decapeptide" PHARMACEUTICAL RESEARCH (NEW YORK), vol. 11, no. 10 SUPPL., 1994, page S88, XP009079050 & NINTH ANNUAL MEETING OF THE AMERICAN ASSOCIATION OF PHARMACEUTICAL SCIENTISTS; SAN DIEGO, CALIFORNIA, USA; NOVEMBER 6-10, 1994 ISSN: 0724-8741 abstract	1-26

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2006/001997

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 2006025524	A1	02-02-2006	WO 2006076042 A2 20-07-2006
WO 0215937	A2	28-02-2002	AT 279209 T 15-10-2004 AU 1495302 A 04-03-2002 DE 10041478 A1 14-03-2002 EP 1313510 A2 28-05-2003 ES 2227301 T3 01-04-2005 JP 2004506697 T 04-03-2004 PT 1313510 T 31-01-2005 US 2003180332 A1 25-09-2003
US 3869549	A	04-03-1975	AR 197116 A1 15-03-1974 AT 335615 B 25-03-1977 AT 140873 A 15-07-1976 AU 472655 B2 03-06-1976 AU 5218973 A 15-08-1974 BE 795516 A1 16-08-1973 CS 172967 B2 28-01-1977 DD 102584 A5 20-12-1973 DE 2306075 A1 23-08-1973 DK 134098 B 13-09-1976 ES 411655 A1 01-09-1976 FR 2181734 A1 07-12-1973 GB 1418408 A 17-12-1975 IE 37151 B1 11-05-1977 IL 41416 A 31-03-1976 JP 48092516 A 30-11-1973 NL 7300953 A 21-08-1973 PL 90318 B1 31-01-1977 SE 7600435 A 16-01-1976
US 2003072803	A1	17-04-2003	NONE
WO 0238129	A2	16-05-2002	AT 344022 T 15-11-2006 AU 1255002 A 21-05-2002 CA 2428159 A1 16-05-2002 DE 10055857 A1 22-08-2002 EP 1337243 A2 27-08-2003 JP 2004513143 T 30-04-2004 NZ 526162 A 28-01-2005 US 2004053817 A1 18-03-2004