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(81) **Designated States** *(unless otherwise indicated, for every kind of national protection available):* AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, 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, IS, JP, KE, KG, KM, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW

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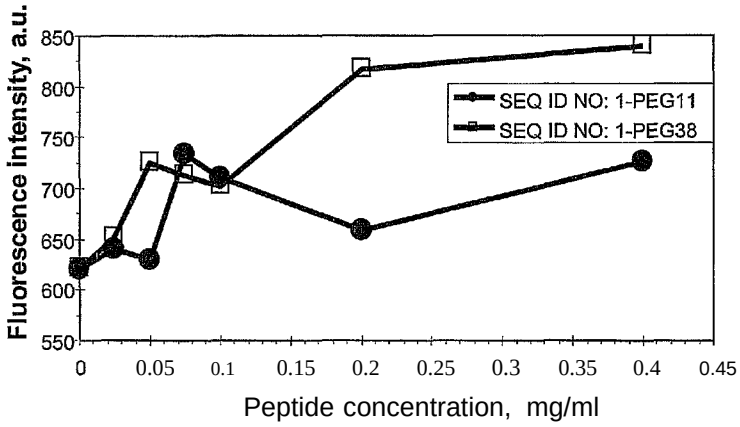
[Continued on next page]

(54) Title: SELF-ASSEMBLING NANOPARTICLES COMPOSED OF TRANSMEMBRANE PEPTIDES AND THEIR APPLICATION FOR SPECIFIC INTRA-TUMOR DELIVERY OF ANTI-CANCER DRUGS

Fig. 1



(57) Abstract: The invention provides a method of handling a hydrophobic agent, which method comprises (a) combining in an aqueous solution (i) a hydrophobic agent and (ii) an isolated peptide that is a structural analog of a transmembrane domain of an integral membrane protein, wherein one terminus of the peptide has one or more negatively charged residues, and (b) allowing the peptide to self-assemble into nanoparticles, wherein the nanoparticles comprise the hydrophobic agent.

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PT, RO, SE, SI, SK, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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— *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. A61K9/51 A61K38/00 A61P35/00 A61K47/42

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 C12N

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 , CHEM ABS Data, BIOSIS, EMBASE, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 01/93836 A (T. BOULIKAS) 13 December 2001 (2001-12-13) the whole document	1-17
A	DATABASE CA CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; XP002492083 retrieved from STN Database accession no. 138: 137534 abstract & S. KIMURA ET AL.: "Molecular assembly formation in solution of spiral forming polypeptides" KYOTO DAIGAKU NIPPON KAGAKU SEN' I KENKYUSHO KOENSHU, vol. 59, 2002, pages 65-70, -/--	1-17

[X] Further documents are listed in the continuation of Box C. [X] 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(ε) 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
14 August 2008	22/08/2008

Name and mailing address of the ISA/	Authorized officer
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	Glikman, J

Form PGT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	DATABASE CA CHEMICAL ABSTRACTS SERVICE, COLUMBUS, OHIO, US; XP002492084 retrieved from STN Database accession no. 146: 206 782 abstract & T. KOGA ET AL.: "Alpha-helical nanoparticle from a poly(leucine)-poly(ethylene glycol) amphiphilic block copolymer containing cross-linking sites and its structural stabilisation" SCIENCE AND ENGINEERING REVIEW OF DOSHISHA UNIVERSITY, vol. 47, no. 3, 2006, pages 185-191,	1-17
A	WO 01/36477 A (THE GOVERNMENT OF THE UNITED STATES ET AL.) 25 May 2001 (2001-05-25) cited in the application the whole document	1-17
A	N. TARASOVA ET AL.: "Inhibition of G-protein coupled receptor function by disruption of transmembrane domain interactions" THE JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 274, no. 49, 1999, pages 34911-34915, XP002168073 the whole document	1-17
A	S. DENNISON ET AL.: "VSV transmembrane domain (TMD) peptide promotes PEG-mediated fusion of liposomes in a conformationally sensitive fashion." BIOCHEMISTRY, vol: 41, 2002, pages 14925-14934, XP002492082 the whole document	1-17
A	A. RÖSLER ET AL.: "Advanced drug delivery devices via self assembly of amphiphilic block copolymers" ADVANCED DRUG DELIVERY REVIEWS, vol: 53, 2001, pages 95-108, XP008095229 paragraphs [02. 1], [03. 1], [0004]	1-17

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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	F. TOURAUD ET AL.: "Nanoparticles of amphiphilic block copolyaminoacid: complexation and release of insulin" PROCEEDINGS OF THE INTERNATIONAL SYMPOSIUM ON CONTROLLED RELEASE OF BIOACTIVE MATERIALS (26TH), 1999, pages 26-27, XP008095220 FR the whole document	1-17
A	Y. KOJIMA ET AL.: "The preparation of self-organized nano-particles composed of peptide-based amphiphiles and the optical resolution properties" TRANSACTIONS OF THE MATERIALS RESEARCH SOCIETY OF JAPAN, vol. 28, no. 3, 2003, pages 585-588, XP008095218 the whole document	1-17
A	R. TU ET AL.: "Liposomal targeting through peptide-amphiphile functionalization" AMERICAN PHARMACEUTICAL REVIEW, vol. 7, no. 2, 2004, pages 36-41, XP008095315 the whole document	1-17

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2007/083772

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. L)(J Claims Nos.:
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 11-14, 17 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. **D** Claim.? 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. [J 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:

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers allsearchable claims.

2. ☐ As all searchable claims could be searched without effort justifying an 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 reportcovers only those claims for which fees were paid, specifically claims Nos.:

4. I I 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 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/US2007/083772

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0193836 A	13-12-2001	AU 7542301 A	17-12-2001
		CA 2411542 Al	13-12-2001
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