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ance Notes on Codes and Abbreviations" appearing at the begin-
ning of each regular issue of the PCT Gazette.

(54) Title: PERIODIC ANTIMICROBIAL PEPTIDES

(57) Abstract: One embodiment of the invention comprises a method of producing periodic peptides, which can have antimicrobial uses, and further comprises the peptides themselves. A preferred method comprises the synthesis of simple periodic peptides made from polymerizing identical monomer units of four or fewer amino acids, wherein the minimum length of active peptide is 15 or 16 residues and wherein the minimum percentage of cationic residues is at least 25%.



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INTERNATIONAL SEARCH REPORT

International Application No
PCT/US2004/005431

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C07K14/47 C07K7/08 A61K38/00 A61K38/16

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 C07K 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, BIOSIS, EMBASE, WPI Data, PAJ

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 5 789 542 A (MCLAUGHLIN MARK L ET AL) 4 August 1998 (1998-08-04) see col. 5, l. 50 - col. 6, l. 10 -----	1-15, 19-22
X	US 6 448 391 B1 (BELKNAP WILLIAM ET AL) 10 September 2002 (2002-09-10) see SEQ Listing -----	1-15, 19-22
X	NIIDOME T ET AL: "REQUIRED STRUCTURE OF CATIONIC PEPTIDE FOR OLIGONUCLEOTIDE-BINDING AND DELIVERING INTO CELLS" JOURNAL OF PEPTIDE SCIENCE, JOHN WILEY AND SONS LTD, GB, vol. 6, no. 6, 2000, pages 271-279, XP008028278 ISSN: 1075-2617 see Table 1 ----- -/-	1-15, 19-22

☒ 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

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"P" document published prior to the international filing date but later than the priority date claimed

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"&" document member of the same patent family

Date of the actual completion of the international search

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US2004/005431

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	JAVADPOUR MARYAM M ET AL: "De novo antimicrobial peptides with low mammalian cell toxicity" BIOSIS, 1 January 1996 (1996-01-01), XP002164830 see the whole document	1-15, 19-22
A	MA JIA ET AL: "Inhibitory activity of synthetic peptide antibiotics on feline immunodeficiency virus infectivity in vitro" JOURNAL OF VIROLOGY, vol. 76, no. 19, October 2002 (2002-10), pages 9952-9961, XP002311578 ISSN: 0022-538X see Table 1	
A	ARLOTTI J A ET AL: "Efficacy of a synthetic lytic peptide in the treatment of prostate cancer" UROLOGIC ONCOLOGY 2001 UNITED STATES, vol. 6, no. 3, 2001, pages 97-102, XP002311579 ISSN: 1078-1439	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2004/005431

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:
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:

see additional sheet

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.:

1-15, 19-22

Remark on Protest

- ☐ The additional search fees were accompanied by the applicant's protest.
- ☐ No protest accompanied the payment of additional search fees.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-15,19-22

An antimicrobial peptide, comprising a periodic peptide with repeating monomer units of 2, 3 or 4 residues, wherein the antimicrobial peptide has a minimum length of 4 residues, has 25-75% cationic residues, and the remaining residues are hydrophobic residues, and wherein the antimicrobial peptide has an IC50 of <125 ug/ml

2. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit KFAK (SEQ ID NOs: 1-8)

3. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit RFAR (SEQ ID NOs: 9-11)

4. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit KKFA (SEQ ID NOs: 12-14)

5. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit LKKL (SEQ ID NOs: 15-18)

6. claims: 16-19 (all partially)

Peptide having the specific repeating monomeric unit KFAF (SEQ ID NO: 19)

7. claims: 16-19(all partially)

Peptide having the specific repeating monomeric unit KFFK (SEQ ID NO: 20)

8. claims: 16-19 (all partially)

Peptide having the specific repeating monomeric unit KFAK (SEQ ID NO: 21)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

9. claims: 16-19 (all partially)

Peptide having the specific repeating monomeric unit KAAK
(SEQ ID NO: 22)

10. claims: 16-19 (all partially)

Peptide having the specific repeating monomeric unit KKAK
(SEQ ID NO: 23)

11. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit KFK
(SEQ ID NOs: 24-32)

12. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit FKA
(SEQ ID NOs: 33-41)

13. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit LKKL
(SEQ ID NOs: 42-50)

14. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit LRLR
(SEQ ID NOs: 51-53)

15. claims: 16-19 (all partially)

Peptides having the specific repeating monomeric unit KGK
(SEQ ID NOs: 54-55)

16. claims: 16-19 (all partially)

Peptide having the specific repeating monomeric unit KTK
(SEQ ID NO: 56)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US2004/005431

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
US 5789542	A	04-08-1998	NONE
US 6448391	B1	10-09-2002	US 6018102 A 25-01-2000
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		JP 10507069 T	14-07-1998
		WO 9603522 A1	08-02-1996
		WO 9603519 A1	08-02-1996
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		US 5955573 A	21-09-1999