

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
23 February 2006 (23.02.2006)

PCT

(10) International Publication Number  
**WO 2006/018652 A3**

(51) International Patent Classification:

C07K 14/00 (2006.01) A61K 38/16 (2006.01)  
C07K 7/06 (2006.01) A61K 38/04 (2006.01)  
C07K 7/08 (2006.01)

(21) International Application Number:

PCT/GB2005/003245

(22) International Filing Date: 18 August 2005 (18.08.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

0418414.9 18 August 2004 (18.08.2004) GB  
11/079,795 14 March 2005 (14.03.2005) US

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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, 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, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, 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

(88) Date of publication of the international search report:

13 July 2006

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

(54) Title: ANTIMICROBIAL PEPTIDES COMPRISING AN ARGININE- AND/OR LYSINE-CONTAINING MOTIF

(57) Abstract: The present invention relates to a peptide comprising amino acids according to Formula (I): ((X)<sub>1</sub>(Y)<sub>m</sub>)<sub>n</sub> wherein 1, m and n are integers from 0 to 10; X and Y, which may be the same or different, are an amino acid selected from the group consisting of hydrophobic amino acids and/or cationic amino acids, for use as a medicaments.

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# INTERNATIONAL SEARCH REPORT

national application No  
EP/GB2005/003245

**A. CLASSIFICATION OF SUBJECT MATTER**  
 INV. C07K14/00 C07K7/06 C07K7/08 A61K38/16 A61K38/04

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)  
 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, EMBASE, BIOSIS, WPI Data, PAJ, Sequence Search, CHEM ABS Data

**C. DOCUMENTS CONSIDERED TO BE RELEVANT**

| Category* | Citation of document, with indication, where appropriate, of the relevant passages  | Relevant to claim No. |
|-----------|---|-----------------------|
| X         | US 2003/087827 A1 (LINDBERG IRIS ET AL)<br>8 May 2003 (2003-05-08)<br>abstract<br>figures 6,9<br>page 1, left-hand column, paragraph 0005<br>page 5, right-hand column; table 2<br>page 6, left-hand column; table 4<br>----- | 1-38                  |
| X         | WO 98/40401 A (MICROLOGIX BIOTECH INC;<br>FRASER, JANET, R; WEST, MICHAEL, H., P;<br>MCNICO) 17 September 1998 (1998-09-17)<br>abstract<br>page 7 - page 12; table 1<br>page 91; claims 1,2<br>-----<br>-/--                  | 1-38                  |

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
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- \*&\* document member of the same patent family

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|---|--|
| Date of the actual completion of the international search | Date of mailing of the international search report |
| 22 March 2006   | 10/04/2006   |

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|---|---|
| Name and mailing address of the ISA/<br>European Patent Office, P.B. 5818 Patentlaan 2<br>NL - 2280 HV Rijswijk<br>Tel. (+31-70) 340-2040, Tx. 31 651 epo nl,<br>Fax: (+31-70) 340-3016 | Authorized officer<br><br>Grötzinger, T |
|---|---|

## INTERNATIONAL SEARCH REPORT

International application No

/GB2005/003245

| C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT |  |                       |
|--|--|-----------------------|
| Category*  | Citation of document, with indication, where appropriate, of the relevant passages   | Relevant to claim No. |
| P,X  | EP 1 502 949 A (TOAGOSEI CO., LTD) -<br>2 February 2005 (2005-02-02)<br>abstract<br>page 10 - page 11; table 1<br>page 13; table 2   | 1-38                  |
| X  | -----<br>HAYNIE S L ET AL: "ANTIMICROBIAL<br>ACTIVITIES OF AMPHIPHILIC PEPTIDES<br>COVALENTLY BONDED TO A WATER-INSOLUBLE<br>RESIN"<br>ANTIMICROBIAL AGENTS AND CHEMOTHERAPY,<br>AMERICAN SOCIETY FOR MICROBIOLOGY,<br>WASHINGTON, DC, US,<br>vol. 39, no. 2,<br>1 February 1995 (1995-02-01), pages<br>301-307, XP000574468<br>ISSN: 0066-4804<br>abstract<br>page 303; table 1         | 1-38                  |
| X  | -----<br>MILLER C T ET AL: "The synthesis and<br>screening of<br>1,4,5,8-naphthalenetetracarboxylic<br>diimide-peptide conjugates with<br>antibacterial activity"<br>BIOORGANIC AND MEDICINAL CHEMISTRY 2001<br>UNITED KINGDOM,<br>vol. 9, no. 8, 2001, pages 2015-2024,<br>XP002373625<br>ISSN: 0968-0896<br>abstract<br>page 2018; table 2<br>page 2019; table 3<br>page 2020; table 4 | 1-38                  |
| X  | -----<br>BESSALLE R ET AL: "AUGMENTATION OF THE<br>ANTIBACTERIAL ACTIVITY OF MAGAININ BY<br>POSITIVE-CHARGE CHAIN EXTENSION"<br>ANTIMICROBIAL AGENTS AND CHEMOTHERAPY,<br>vol. 36, no. 2, 1992, pages 313-317,<br>XP002373626<br>ISSN: 0066-4804<br>abstract<br>page 314; figure 1   | 1-38                  |
| X  | -----<br>ZASLOFF M: "ANTIMICROBIAL PEPTIDES OF<br>MULTICELLULAR ORGANISMS"<br>NATURE, NATURE PUBLISHING GROUP, LONDON,<br>GB,<br>vol. 415, no. 6870,<br>24 January 2002 (2002-01-24), pages<br>389-395, XP001027353<br>ISSN: 0028-0836<br>abstract<br>page 390; table 1<br>-----   | 1-38                  |

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/GB2005/003245

## 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.: 35-38  
because they relate to subject matter not required to be searched by this Authority, namely:  
Although claims 35 to 38 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

Information on patent family members

International application No  
PCT/GB2005/003245

| Patent document cited in search report | A1 | Publication date | Patent family member(s) | Publication date |
|--|----|------------------|-------------------------|------------------|
| US 2003087827                          | A1 | 08-05-2003       | NONE                    |                  |
| <hr/>                                  |    |                  |                         |                  |
| WO 9840401                             | A  | 17-09-1998       | AU 6604798              | A 29-09-1998     |
|  |    |                  | CA 2282807              | A1 17-09-1998    |
|  |    |                  | EP 0966481              | A2 29-12-1999    |
|  |    |                  | JP 2002544759           | T 24-12-2002     |
| <hr/>                                  |    |                  |                         |                  |
| EP 1502949                             | A  | 02-02-2005       | AU 2003231471           | A1 10-11-2003    |
|  |    |                  | CN 1650005              | A 03-08-2005     |
|  |    |                  | WO 03091429             | A1 06-11-2003    |
|  |    |                  | US 2006057668           | A1 16-03-2006    |
| <hr/>                                  |    |                  |                         |                  |