(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
26 May 2006 (26.05.2006)

PCT

(10) International Publication Number
WO 2006/053565 A3

(51) International Patent Classification:
C12N 15/80 (2006.01) *C07K 14/415* (2006.01)
C12N 15/12 (2006.01) *C12N 15/82* (2006.01)
C12N 15/29 (2006.01) *A61K 38/16* (2006.01)
C07K 14/435 (2006.01)

(21) International Application Number:
PCT/DK2005/000735

(22) International Filing Date:
18 November 2005 (18.11.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

PA 2004 01797	19 November 2004 (19.11.2004)	DK
PA 2004 01798	19 November 2004 (19.11.2004)	DK
PA 2004 01795	19 November 2004 (19.11.2004)	DK
PA 2004 01799	19 November 2004 (19.11.2004)	DK
PA 2004 01796	19 November 2004 (19.11.2004)	DK

(71) Applicant *(for all designated States except US)*: **NOVOZYMES A/S** [DK/DK]; Krogshoejvej 36, DK-2880 Bagsvaerd (DK).

(72) Inventors: **RAVENTOS, Dorotea, Raventos**; Ejlersvej 13, DK-3050 Humlebaek (DK). **MYGIND, Per, Holse**; Soeborg Park Allé 60, DK-2860 Soeborg (DK). **HANSEN, Mogens, Trier**; Mosevang 9, DK-3540 Lynge (DK). **SORENSEN, Marianne, Vind**; Gulddyssevaenget 9, Gundsoemagle, DK-4000 Roskilde (DK). **SANDVANG, Dorthe**; Gyldenlakvej 29, DK-2300 Koebenhavn S (DK).

(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, 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:
7 December 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.

WO 2006/053565 A3

(54) Title: POLYPEPTIDES HAVING ANTIMICROBIAL ACTIVITY AND POLYNUCLEOTIDES ENCODING SAME

(57) Abstract: The present invention relates to isolated polypeptides having antimicrobial activity and isolated polynucleotides encoding the polypeptides. The invention also relates to nucleic acid constructs, vectors, and host cells comprising the polynucleotides as well as methods for producing and using the polypeptides.

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2005/000735

A. CLASSIFICATION OF SUBJECT MATTER
INV. C12N15/80 C12N15/12 C12N15/29 C07K14/435 C07K14/415
C12N15/82 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)
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, Sequence Search, WPI Data, BIOSIS

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 03/044049 A (NOVOZYMES A/S; SCHNORR, KIRK, MATTHEW; HANSEN, MOGENS, TRIER; MYGIND,) 30 May 2003 (2003-05-30) cited in the application sequences 1,2,3,11 page 41 - page 44; claims; examples 1-3 claims page 36, line 14 - page 37, line 33 page 28 page 26 ----- -/--	1,10-12, 14-18, 27-32

[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(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	Date of mailing of the international search report
10 February 2006	01. 09. 2006

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	Le Cornec, N

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

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2005/000735

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL 10 July 2004 (2004-07-10), M.-J. MORENCY ET AL: "GQ01132.B3_K03: Elongation roots tips- saplings Picea glauca cDNA clone genomeQuebec_Id:GQ0132K03 5', mRNA sequence" XP002366998 retrieved from EBI, HINXTON , UK Database accession no. CO476941 abstract --- DATABASE EMBL 10 July 2004 (2004-07-10), M.-J. MORENCY ET AL: "GQ01132.B7_K03 GQ013: Elongation ROOTS tips- saplings Picea glauca cDNA clone genomeQuebec_Id:GQ0132K03 5', mRNA sequence" XP002366999 retrieved from EBI, HINXTON, UK Database accession no. CO478284 abstract	12,19
X		12,19
A	EP 1 146 052 A (E.I. DU PONT DE NEMOURS AND COMPANY) 17 October 2001 (2001-10-17) page 13 - page 16; claims examples 3-6	1-22, 27-37
A	WO 02/090384 A (NOVOZYMES A/S; HANSEN, MOGENS, TRIER) 14 November 2002 (2002-11-14) cited in the application claims page 28 - page 32; examples 1-4	1-22, 27-37
A	BULET PHILIPPE ET AL: "A novel insect defensin mediates the inducible antibacterial activity in larvae of the dragonfly Aeschna cyanea (Paleoptera, Odonata)" EUROPEAN JOURNAL OF BIOCHEMISTRY, vol. 209, no. 3, 1992, pages 977-984, XP002365744 ISSN: 0014-2956 the whole document	1-22, 27-37

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/DK2005/000735

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 03044049 A	30-05-2003	AU 2002349293 A1	10-06-2003
		BR 0214302 A	26-10-2004
		CA 2467927 A1	30-05-2003
		CN 1606567 A	13-04-2005
		EP 1448595 A1	25-08-2004
		HU 0402271 A2	28-02-2005
		JP 2005533481 T	10-11-2005
		MX PA04004704 A	19-08-2004
		US 2005124064 A1	09-06-2005
EP 1146052 A	17-10-2001	NONE	
WO 02090384 A	14-11-2002	EP 1389217 A2	18-02-2004
		US 2006183675 A1	17-08-2006

INTERNATIONAL SEARCH REPORT

International application No.
PCT/DK2005/000735

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. [X] Claims Nos.: 29 partially
because they relate to subject matter not required to be searched by this Authority, namely:

Although claim 29 (as far as an in vivo method is concerned) is 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:

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. [X] 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.:

1-22, 27-32 all partially

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: 1-22, 27-32 all partially

   Polypeptide having antimicrobial activity represented by the amino acid sequence ID no.2 and its DNA encoding it represented by the polynucleotide sequence ID no.1. Recombinant expression vector. Host cell. Method for producing it by genetic engineering. Uses in medicine, in animal feed, in transgenic plants.

   ---

2. claims: 1-22, 27-32 all partially

   Polypeptide having antimicrobial activity represented by the amino acid sequence ID no.4 and its DNA encoding it represented by the polynucleotide sequence ID no.3. Recombinant expression vector. Host cell. Method for producing it by genetic engineering. Uses in medicine, in animal feed, in transgenic plants.

   ---

3. claims: 1-22, 27-32 all partially

   Polypeptide having antimicrobial activity represented by the amino acid sequence ID no.8 and its DNA encoding it represented by the polynucleotide sequence ID no.7. Recombinant expression vector. Host cell. Method for producing it by genetic engineering. Uses in medicine, in animal feed, in transgenic plants.

   ---

4. claims: 1-22, 27-32 all partially

   Polypeptide having antimicrobial activity represented by the amino acid sequence ID no.6 and its DNA encoding it represented by the polynucleotide sequence ID no.5. Recombinant expression vector. Host cell. Method for producing it by genetic engineering. Uses in medicine, in animal feed, in transgenic plants.

   ---

5. claims: 1-22, 27-32 all partially

   Polypeptide having antimicrobial activity represented by the amino acid sequence ID no.10 and its DNA encoding it represented by the polynucleotide sequence ID no.9. Recombinant expression vector. Host cell. Method for producing it by genetic engineering. Uses in medicine, in animal feed, in transgenic plants.

   ---

6. claims: 23-26

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

A nucleic acid construct comprising a gene encoding a protein linked to one or both of a first nucleotide sequence encoding a signal peptide consisting of nucleotides 1-60 of sequence ID no.1 or nucleotides 1-66 of sequence ID no.5 or nucleotides 1-66 of sequence ID no.7 or nucleotides 1-66 of sequence ID no.9 and a second nucleotide sequence encoding a propeptide consisting of nucleotides 61-150 of the sequence ID no.1, wherein the gene is foreign to the first and to the second nucleotide sequences. A recombinant vector and a host cell comprising this construct.
