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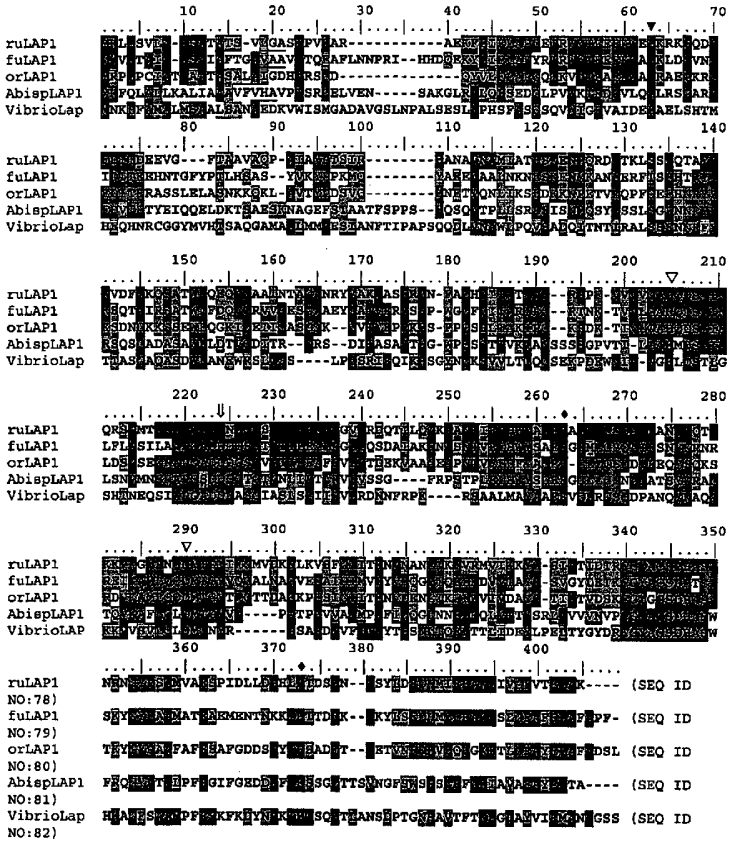
(84) Designated States *(unless otherwise indicated, for every kind of regional protection available)*: ARIPO (BW, GH,

[Continued on next page]

(54) Title: NOVEL FUNGAL PROTEINS AND NUCLEIC ACIDS ENCODING SAME



(57) Abstract: Disclosed herein are fungal nucleic acid sequences that encode novel polypeptides. Also disclosed are polypeptides encoded by these nucleic acid sequences, as well as derivatives, variants, mutants, or fragments of the aforementioned polypeptide, polynucleotide, or antibody. The novel leucine aminopeptidase (LAP) and other amino- and carboxypeptidases polypeptides, referred to herein as EXOX nucleic acids and proteins of the invention are useful in a variety of medical, research, and commercial applications.

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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, IT, LU, 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).

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INTERNATIONAL SEARCH REPORT

PCT/IB2004/002963

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 C12N15/31 C12N9/48 C12N5/10 A61K38/46 A61K31/00
A61K33/00 G01N33/50

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 C12N A61K G01N

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, Sequence Search

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	WOODFOLK JUDITH A ET AL: "Trichophyton antigens associated with IgE antibodies and delayed type hypersensitivity: Sequence homology to two families of serine proteinases" JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 273, no. 45, 6 November 1998 (1998-11-06), pages 29489-29496, XP002321812 ISSN: 0021-9258 figure 1 ----- -/--	1-10, 13-15, 24-31

[X] 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

"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
21 March 2005	13 -07- 2005

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	Holtorf, S

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	MONOD MICHEL ET AL: "Secreted proteases from pathogenic fungi." IJMM INTERNATIONAL JOURNAL OF MEDICAL MICROBIOLOGY, vol. 292, no. 5-6, October 2002 (2002-10), pages 405-419, XP008044639 ISSN: 1438-4221 table 1	1-10, 13-15, 24-31

A	BEAUVAIS A ET AL: "Dipeptidyl-peptidase IV secreted by Aspergillus fumigatus, a fungus pathogenic to humans" INFECTION AND IMMUNITY, AMERICAN SOCIETY FOR MICROBIOLOGY. WASHINGTON, US, vol. 8, no. 65, August 1997 (1997-08), pages 3042-3047, XP002076492 ISSN: 0019-9567 the whole document	
A	& DATABASE EMBL SEQUENCE LIBRARY [Online] EBI.HINXTON; 12 September 1997 (1997-09-12), BEAUVAIS, A., ET AL.: "Dipeptidyl-peptidase IV secreted by Aspergillus fumigatus, a fungus pathogenic to humans" retrieved from EBI.HINXTON Database accession no. U87950 abstract	

A	BEAUVAIS ANNE ET AL: "Biochemical and antigenic characterization of a new dipeptidyl-peptidase isolated from Aspergillus fumigatus" JOURNAL OF BIOLOGICAL CHEMISTRY, vol. 272, no. 10, 1997, pages 6238-6244, XP002047736 ISSN: 0021-9258 figure 4 figure 5	
A	& DATABASE EMBL SEQUENCE LIBRARY [Online] EBI.HINXTON; 26 August 1997 (1997-08-26), BEAUVAIS A., MONOD M., ET AL.: "Biochemical and antigenic characterization of a new dipeptidyl-peptidase isolated from Aspergillus fumigatus" retrieved from EBI.HINXTON Database accession no. L48074 abstract	

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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.
T	MONOD, M., ET AL.: "aminopeptidases and dipeptidyl-peptidases secreted by the dermatophyte Trichophyton rubrum" MICROBIOLOGY, vol. 151, January 2005 (2005-01), pages 145-155, XP002321813 the whole document -----	

INTERNATIONAL SEARCH REPORT

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Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application and necessary to the claimed invention, the international search was carried out on the basis of:

   a. type of material

   [X] a sequence listing

   [ ] table(s) related to the sequence listing

   b. format of material

   [X] in written format

   [X] in computer readable form

   c. time of filing/furnishing

   [ ] contained in the international application as filed

   [ ] filed together with the international application in computer readable form

   [X] furnished subsequently to this Authority for the purpose of search

2. [X] In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

INTERNATIONAL SEARCH REPORT

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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.:

1-6, 8, 9, 10-39, 41-46, 48-53, 55-66 partially, 7, 40, 47, 54 completely

Remark on Protest

☐ The additional search fees were accompanied by the applicant's protest.

☐ No protest accompanied the payment of additional search fees.

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

1. claims: 1-6,8,9,10-39, 41-46,48-53,55-66 partially, 7,40,47,54 completely

   Isolated polypeptide comprising the amino acid sequence as characterized by SEQID3 / 6, wherein the polypeptide is ruLAP2/ruLAP1, a composition comprising said polypeptide, a kit comprising said composition, a dermatophyte and mcirobial culture supernatant comprising said polypeptide, use of said polypeptide in the manufacture of a medicament, method of identifying a potential therapeutic agent, method fror treating a pathological state in a mammal by administering said polypeptide or a protease inhibitor in an amount sufficient to alleviate the pathological state, isolated nucleic acid molecule as characterized by SEQID1,2 / 4,5, the recombinant expression of the same in a host cell and the method of producing the same by culturing the host cell, method of treating mycoses by administering an effective amount of an inhibitor

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2. claims: 1-6,8,9,10-39, 41-46,48-53,55-66 partially

   the same as invention 1, but limited to the nucleotide sequences encoding Leucine aminopeptidases fuLAP1 and fuLAP2 from Aspergillus fumigatus as characterized by SEQIDs 7,8,9 and 10,11,12, respectively.

   ---

3. claims: 1-5,8,9,10-38, 41-46,48-51,55-66 partially

   the same as invention 1, but limited to the nucleotide sequences encoding the carboxypeptidases ruCBPS1 and ruCBPS' from Trichophyton rubrum as characterized by SEQIDs 13,14,15 and 16,17,18, respectively.

   ---

4. claims: 1-5,8,9,10-38, 41-46,48-52,55-66 partially

   the same as invention 1, but limited to the nucleotide sequence encoding propylaminopeptidase ruPAP from Trichophyton rubrum as characterized by SEQIDs 19,20,21.

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5. claims: 1-5,8,9,10-38, 41-46,48-52,55-66 partially

   the same as invention 1, but limited to the nucleotide sequence encoding aminopeptidase P ruAMPP from Trichophyton rubrum as characterized by SEQIDs 22,23,24.

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6. claims: 1-5,8,9,10-38, 41-46,48-52,55-66 partially

the same as invention 1, but limited to the nucleotide sequence encoding prolidase ruPLD from Trichophyton rubrum as characterized by SEQIDs 25,26,27.

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7. claims: 1-6,8,9,10-39, 41-46,48-53,55-66 partially

the same as invention 1, but limited to the nucleotide sequence encoding Leucine aminopeptidase caLAP2 from Microsporum canis as characterized by SEQIDs 28,29,30.

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8. claims: 1-6,8,9,10-39, 41-46,48-53,55-66 partially

the same as invention 1, but limited to the nucleotide sequence encoding Leucine aminopeptidase meLAP2 from Trichophyton mentagrophytes as characterized by SEQIDs 31,32,33.

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9. claims: 1-5,8,9,10-38, 41-46,48-52,55-66 partially

the same as invention 1, but limited to the nucleotide sequence encoding Dipeptidyl-Peptidase IV ruDPPIV from Trichophyton rubrum as characterized by SEQIDs 34,35,36.
