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(54) Title: LIPOLYTIC ENZYME VARIANTS

(57) Abstract: Variants with increased acyl transferase activity can be designed on the basis of a three-dimensional model by making amino acid alterations near the active Ser of lipolytic enzymes such as *C. antarctica* lipase A or the lipase/acyl transferase from *C. parapsilosis*.

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2007/060473

<b>A. CLASSIFICATION OF SUBJECT MATTER</b> INV. C12N9/20 G06F19/00		
According to International Patent Classification (IPC) or to both national classification and IPC		
<b>B. FIELDS SEARCHED</b>		
Minimum documentation searched (classification system followed by classification symbols) C12N G06F		
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 , WPI Data, CHEM ABS Data, Sequence Search, BIOSIS, EMBASE		
<b>C. DOCUMENTS CONSIDERED TO BE RELEVANT</b>		
Category *	Citation of document, with indication where appropriate, of the relevant passages	Relevant to claim No
T	KASRAYAN A ET AL.: "Prediction of the Candida antarctica Lipase A protein structure by comparative modeling and site-directed mutagenesis" CHEM. BIO. CHEM., vol. 8, 13 July 2007 (2007-07-13), pages 1409-1415, XP002446023 the whole document page 1413, left-hand column, paragraph 3 -----	1-7
A	WO 94/01541 A (NOVONORDISK AS [DK]; SVENDSEN ALLAN [DK]; PATHAR SHAMKANT ANANT [DK];) 20 January 1994 (1994-01-20) the whole document examples 2,3 ----- -/--	1-7
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C		<input checked="" type="checkbox"/> See patent family annex
Special categories of cited documents		
<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>		<p>"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</p> <p>"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</p> <p>"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</p> <p>"&amp;" document member of the same patent family</p>
Date of the actual completion of the international search  31 January 2008		Date of mailing of the international search report  26/05/2008
Name and mailing address of the ISA/ 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		Authorized officer  Petri , Bernhard

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2007/060473

C(Continuatio π). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category'	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No
A	<p>AKOH C C ET AL: "PROTEIN ENGINEERING AND APPLICATIONS OF CANDIDA RUGOSA LIPASE ISOFORMS" LIPIDS, CHAMPAIGN, IL, US, vol. 39, no. 6, June 2004 (2004-06), pages 513-526, XP008050889 ISSN: 0024-4201 the whole document page 520, right-hand column, paragraph 2 - page 521, left-hand column, paragraph 1 -----</p>	1-7
A	<p>MANETTI A F ET AL: "Design and realization of a tailor-made enzyme to modify the molecular recognition of 2-arylpropionic esters by Candida rugosa lipase" BIOCHIMICA ET BIOPHYSICA ACTA. PROTEIN STRUCTURE AND MOLECULAR ENZYMOLOGY, ELSEVIER, AMSTERDAM,, NL, vol. 1543, no. 1, 30 November 2000 (2000-11-30), pages 146-158, XP004279102 ISSN: 0167-4838 the whole document paragraph [03.2]; figure 4 -----</p>	1-7

INTERNATIONAL SEARCH REPORT

International application No  
PCT/EP2007/060473

**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  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 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

see additional sheet

- 1  As all required additional search fees were timely paid by the applicant this international search report covers allsearchable
  
- 2 **D** 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 report covers
  
- 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  
see additional sheet(s)

**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

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

Invention 1-5: Claims 1-7

A method of preparing a polypeptide comprising the step of generating a 3D model of Seq.Id.No 1, 2, 3, 4, 5, respectively.

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Invention 6: Claims 8-9

Polypeptide with 80% identity to Seq.Id.No 1 and substitutions, insertions, deletions at position 80-85, 108, ... 425.

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# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2007/060473

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 9401541	A	20-01-1994	
		BR 9306694 A	08-12-1998
		EP 0652945 A1	17-05-1995
		JP 7508416 T	'21-09-1995
		MX 9304027 A1	31-05-1994
		US 6074863 A	13-06-2000

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