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- (81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, TZ, UA, UG, US, UZ, VN, YU, ZA, ZW.

[Continued on next page]

(54) Title: NOVEL LIPASE GENES

Clone name	SEQ ID NO	Enantioselectivity for Neryl Butyrate (N) or Geranyl Butyrate (G)
1f15 (G2)	21	G
3C12	22	G
3N19 (G2)	23	G
G2.2	24	G
2C3	25	G
2F11	26	G
KV11 (6C7)	27	N
KV6 (3A1)	28	N
KV2 (2D1)	29	N
N2.5	30	N
KV5 (2H6)	31	N
3E5	32	G
G2.1	33	G
3H24 (G2)	34	G
KV10 (4G6)	35	N
KV12 (6D4)	36	N
N2.2	37	N
N2.3	38	N
N2.1	39	N
KV4 (2E12)	40	N
KV9 (4C6)	41	N
7D6	42	G
3F3	43	G
2D11 (G2)	44	G
3C23 (G2)	45	G
G2.3	46	G
2A3	47	G
2F4	48	G
2B9 (G2)	49	G
2C5	50	G
KV1 (2A6)	51	N
2D13 (G2)	52	G
3C8	53	G
2D5	54	G

(57) Abstract: New lipase enzymes (both nucleic acids and polypeptides) are provided. Compositions which include these polypeptides, proteins, nucleic acids, recombinant cells, as well as methods involving the enzymes, antibodies to the enzymes, and methods of using the enzymes are also provided.

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

17 October 2002

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.

Published:

- *with international search report*
- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments*

INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/22160

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N15/00 C12N9/20 C12N15/75 C11D3/386 C12P41/00
 C07K14/32 A61K38/46

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 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, BIOSIS, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 91 16422 A (KALI CHEMIE AG) 31 October 1991 (1991-10-31) figure 1 --- -/--	1-123, 127-166

☒ 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.

Z document member of the same patent family

Date of the actual completion of the international search

30 July 2002

Date of mailing of the international search report

26/08/2002

Name and mailing address of the ISA

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/US 01/22160

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 SWISSPROT 'Online! 1 October 1994 (1994-10-01) DARTOIS V ET AL.: "Lipase precursor (EC 3.1.1.3) (Triacylglycerol lipase)" Database accession no. P37957 XP002207688 abstract	1-123, 127-166
X	-& DARTOIS V ET AL.: "Cloning, nucleotide sequence and expression in Escherichia coli of a lipas gene from Bacillus subtilis 168" BIOCHIM. BIOHYS. ACTA, vol. 1131, 1992, pages 253-260, XP001094213 the whole document	1-123, 127-166
P,X	--- DATABASE SWISSPROT 'Online! 1 October 2000 (2000-10-01) NTHANGENI M B ET AL.: "Lipase (EC 3.1.1.3) (Fragment)" Database accession no. Q9K5F4 XP002207689 abstract	1-123, 127-166
P,X	-& NTHANGENI M B ET AL.: "Over-expression and properties of a purified recombinant Bacillus licheniformis lipase: acomparative report on Bacillus lipases" ENZYM. MICROB. TECHNOL., vol. 28, 2001, pages 705-712, XP002207687 the whole document	1-123, 127-166
X	--- DATABASE SWISSPROT 'Online! 1 May 1997 (1997-05-01) RUIZ C ET AL.: "Extracellular esterase precursor (EC 3.1.1.1) (YFIP)" Database accession no. P94444 XP002207690 abstract	1-123, 127-166
X	-& YAMAMOTO H ET AL.: "The Bacillus subtilis chromosome region near 78° contains the genes encoding a new two-component system, three ABC transporters and a lipase" GENE, vol. 181, 1996, pages 147-151, XP000407183 the whole document	1-123, 127-166
A	--- KUNST F ET AL: "THE COMPLETE GENOME SEQUENCE OF THE GRAM-POSITIVE BACTERIUM BACILLUS SUBTILIS" NATURE, MACMILLAN JOURNALS LTD. LONDON, GB, vol. 390, 1997, pages 249-256, XP000919353 ISSN: 0028-0836 -----	

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US 01/22160

Box I Observations where certain claims were found unsearchable (Continuation of item 1 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.: 124-126 completely; 166 partially
because they relate to subject matter not required to be searched by this Authority, namely:
see FURTHER INFORMATION sheet PCT/ISA/210
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 II Observations where unity of invention is lacking (Continuation of item 2 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.:

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

Continuation of Box I.1

Although claim 166 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.

Continuation of Box I.1

Claims Nos.: 124-126 completely; 166 partially

Rule 39.1(v) PCT - Presentation of information (claims 124-126)

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

Invention 1: claims 1-123, 127-166 all partially

The protein of SEQ ID NO. 75, the nucleic acid sequence of SEQ ID No. 21 encoding it, methods related thereto.

Inventions 2-34: claims 1-123,
127-166 all partially

The proteins of SEQ ID No. 76-108, the nucleic acids of SEQ ID No. 22-54 encoding them, methods related thereto.

Inventions 35-54: claims 1-124,
127-166 all partially

The proteins of SEQ ID No. 55-74, the nucleic acids of SEQ ID No. 1-20 encoding them, methods related thereto.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/US 01/22160

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
WO 9116422	A	31-10-1991	AT 107355 T	15-07-1994
			DE 4111321 A1	17-10-1991
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