

(19) World Intellectual Property
Organization
International Bureau



(43) International Publication Date
5 February 2004 (05.02.2004)

PCT

(10) International Publication Number
WO 2004/011638 A3

(51) International Patent Classification⁷: **C12N 9/14**,
G06F 17/50, C12N 15/55

(21) International Application Number:
PCT/CA2003/001129

(22) International Filing Date: 31 July 2003 (31.07.2003)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/399,971 31 July 2002 (31.07.2002) US
PCT/CA03/00485 8 April 2003 (08.04.2003) CA

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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, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC,

[Continued on next page]

(54) Title: DEOXYURIDINE 5' TRIPHOSPHATE NUCLEOTIDOHYDROLASE POLYPEPTIDES AND STRUCTURES



(57) Abstract: The present invention relates to novel drug targets for pathogenic bacteria. Accordingly, the invention provides purified proteins comprising the amino acid sequences set forth in SEQ ID NO: 4 and SEQ ID NO: 13. The invention also provides biochemical and biophysical characteristics of the polypeptides of the invention.



LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NI, NO, NZ, OM, PG, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, SY, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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*

(88) Date of publication of the international search report:
1 July 2004

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.

INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 03/01129

A. CLASSIFICATION OF SUBJECT MATTER

IPC 7 C12N9/14 G06F17/50 C12N15/55

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 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, MEDLINE, EMBL

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TETTELIN H ET AL: "Complete genome sequence of a virulent isolate of <i>Streptococcus pneumoniae</i> " SCIENCE, AMERICAN ASSOCIATION FOR THE ADVANCEMENT OF SCIENCE,, US, vol. 293, no. 5529, 2001, pages 498-506, XP002218261 ISSN: 0036-8075	1-4, 26, 27
Y	the whole document -& DATABASE SWALL 'Online! 1 October 2001 (2001-10-01), XP002256059 retrieved from EBI Database accession no. Q97TB9 abstract ----- -/--	5-37, 39-41, 55-70



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

21 November 2003

Date of mailing of the international search report

14. 05. 04

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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 03/01129

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	HOSKINS J ET AL: "Genome of the Bacterium Streptococcus pneumoniae Strain R6" JOURNAL OF BACTERIOLOGY, WASHINGTON, DC, US, vol. 183, no. 19, October 2001 (2001-10), pages 5709-5717, XP002231307 ISSN: 0021-9193	1-4
Y	-& DATABASE EMBL 'Online! 7 September 2001 (2001-09-07), XP002262428 retrieved from EBI Database accession no. AE008386 abstract	5-37, 39-41, 55-70
Y	----- KRAFT P ET AL: "Infrared, surface-assisted laser desorption ionization mass spectrometry on frozen aqueous solutions of proteins and peptides using suspensions of organic solids" JOURNAL OF THE AMERICAN SOCIETY FOR MASS SPECTROMETRY, ELSEVIER SCIENCE INC., NEW YORK, NY, US, vol. 9, no. 9, September 1998 (1998-09), pages 912-924, XP004149186 ISSN: 1044-0305 the whole document	5-7
Y	----- CEDERGREN-ZEPPEZAUER E S ET AL: "Crystal structure of a dUTPase." NATURE. ENGLAND 20 FEB 1992, vol. 355, no. 6362, 20 February 1992 (1992-02-20), pages 740-743, XP001155358 ISSN: 0028-0836 the whole document	8-18,28, 29,33-37
Y	----- NORD A J ET AL: "The C-terminus of dUTPase: observation on flexibility using NMR" FEBS LETTERS, ELSEVIER SCIENCE PUBLISHERS, AMSTERDAM, NL, vol. 492, no. 3, 16 March 2001 (2001-03-16), pages 228-232, XP004257368 ISSN: 0014-5793 the whole document	20-24
Y	----- US 6 356 845 B1 (BENSON TIMOTHY E ET AL) 12 March 2002 (2002-03-12) the whole document	19, 30-32, 39-41, 55-70
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 03/01129

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	BURKHARD P ET AL: "The discovery of steroids and other novel FKBP inhibitors using a molecular docking program." JOURNAL OF MOLECULAR BIOLOGY. ENGLAND 16 APR 1999, vol. 287, no. 5, 16 April 1999 (1999-04-16), pages 853-858, XP002256057 ISSN: 0022-2836 the whole document	19, 30-32, 39-41, 55-70
Y	MOORE J M: "NMR techniques for characterization of ligand binding: utility for lead generation and optimization in drug discovery." BIOPOLYMERS. UNITED STATES 1999, vol. 51, no. 3, 1999, pages 221-243, XP002256058 ISSN: 0006-3525 the whole document	25
A	DATABASE GSP 'Online! 2 July 2002 (2002-07-02), XP002262429 retrieved from EBI Database accession no. ABP30148 abstract & WO 02/34771 A (MARGARIT Y ROS IMMACULADA ;CHIRON SPA (IT); GRANDI GUIDO (IT); MAS) 2 May 2002 (2002-05-02)	
A	GONZÁLEZ A ET AL: "Atomic resolution structure of Escherichia coli dUTPase determined ab initio." ACTA CRYSTALLOGRAPHICA. SECTION D, BIOLOGICAL CRYSTALLOGRAPHY. DENMARK JUN 2001, vol. 57, no. Pt 6, June 2001 (2001-06), pages 767-774, XP009018221 ISSN: 0907-4449 the whole document	
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INTERNATIONAL SEARCH REPORT

International Application No

PCT/CA 03/01129

C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	BAGBY S ET AL: "OPTIMIZATION OF PROTEIN SOLUBILITY AND STABILITY FOR PROTEIN NUCLEAR MAGNETIC RESONANCE" METHODS IN ENZYMOLOGY, ACADEMIC PRESS INC, SAN DIEGO, CA, US, vol. 339, 2001, pages 20-41, XP001152932 ISSN: 0076-6879 the whole document	
P,X	----- WO 02/077021 A (CHIRON SPA ;MASIGNANI VEGA (IT); FRASER CLAIRE (US); TETTELIN HERV) 3 October 2002 (2002-10-03) -& DATABASE PATENT_PRT 'Online! 29 November 2002 (2002-11-29), XP002262430 retrieved from EBI Database accession no. AX571540 abstract -----	1-74

INTERNATIONAL SEARCH REPORT

national application No.
PCT/CA 03/01129

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.: 38, 42-54, 71-74
because they relate to subject matter not required to be searched by this Authority, namely:
Rule 39.1(v) PCT - Presentation of information
Rule 39.1(i) PCT - Mathematical method
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.:
1-37, 39-41, 55-70

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

Claims Nos.: 38,42-54,71-74

Rule 39.1(v) PCT - Presentation of information

Rule 39.1(i) PCT - Mathematical method

The applicant's attention is drawn to the fact that claims relating to inventions in respect of which no international search report has been established need not be the subject of an international preliminary examination (Rule 66.1(e) PCT). The applicant is advised that the EPO policy when acting as an International Preliminary Examining Authority is normally not to carry out a preliminary examination on matter which has not been searched. This is the case irrespective of whether or not the claims are amended following receipt of the search report or during any Chapter II procedure. If the application proceeds into the regional phase before the EPO, the applicant is reminded that a search may be carried out during examination before the EPO (see EPO Guideline C-VI, 8.5), should the problems which led to the Article 17(2) declaration be overcome.

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 1-74

polypeptides with sequence of SEQ ID NO: 11 or 13,
polynucleotides with sequence of SEQ ID NO: 10 or 12
encoding said polypeptides, compositions and samples
containing said polypeptides for structural analysis or
expression, crystallized forms of said polypeptides, methods
using said polypeptides, polynucleotides or 3D structural
information

Invention 2: claims 75-100

polypeptides with sequence of SEQ ID NO: 2 or 4,
polynucleotides with sequence of SEQ ID NO: 1 or 3 encoding
said polypeptides, compositions and samples containing said
polypeptides for structural analysis or expression,
crystallized forms of said polypeptides, methods using said
polypeptides, polynucleotides or 3D structural information

INTERNATIONAL SEARCH REPORT

Information on patent family members

International Application No

PCT/CA 03/01129

Patent document cited in search report		Publication date	Patent family member(s)	Publication date
US 6356845	B1	12-03-2002	US 2002156585 A1	24-10-2002
			AU 6523100 A	05-03-2001
			CA 2378032 A1	15-02-2001
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