

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
23 November 2006 (23.11.2006)

PCT

(10) International Publication Number
WO 2006/122822 A3

(51) International Patent Classification:
C07K 16/00 (2006.01)

(21) International Application Number:

PCT/EP2006/004767

(22) International Filing Date: 19 May 2006 (19.05.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:

| | | |
|-----------|-------------------------------|----|
| 0510277.7 | 20 May 2005 (20.05.2005) | GB |
| 0511353.5 | 3 June 2005 (03.06.2005) | GB |
| 0526372.8 | 28 December 2005 (28.12.2005) | GB |

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, US, 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).

(71) Applicant (for all designated States except US): **LONZA BIOLOGICS PLC.** [GB/GB]; 228-230 Bath Road, Slough SL1 4DY (GB).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **RANCE, James** [GB/GB]; 254 Leigh Hunt Drive, London N14 6DS (GB). **KALWY, Stephan** [NL/GB]; 98 Montague Road, Slough SL1 3RW (GB). **YOUNG, Robert** [GB/GB]; 67 Hamlet Square, London NW2 1SR (GB).

(74) Agent: **RIEGLER, Norbert, Hermann;** c/o Lonza AG, Münchensteinerstrasse 38, CH-4002 Basel (CH).

(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,

Declarations under Rule 4.17:

- as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))
- of inventorship (Rule 4.17(iv))

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:

12 April 2007

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.

(54) Title: HIGH-LEVEL EXPRESSION OF RECOMBINANT ANTIBODY IN A MAMMALIAN HOST CELL

(57) Abstract: The invention relates to a mammalian host cell with a high-level expression of recombinant antibody containing a double-gene vector with gene optimized nucleotide sequences encoding the light and the heavy antibody chains, the double-gene vector itself and a process for enhancing the production of recombinant antibody in a mammalian host cell.



WO 2006/122822 A3

INTERNATIONAL SEARCH REPORT

International application No
PCT/EP2006/004767

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07K16/00

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)
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, CHEM ABS Data, Sequence Search, BIOSIS, EMBASE, MEDLINE, FSTA

C. DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X | NORDERHAUG L ET AL: "Versatile vectors for transient and stable expression of recombinant antibody molecules in mammalian cells" JOURNAL OF IMMUNOLOGICAL METHODS, ELSEVIER SCIENCE PUBLISHERS B.V., AMSTERDAM, NL, vol. 204, no. 1, 12 May 1997 (1997-05-12), pages 77-87, XP004107719 ISSN: 0022-1759 the whole document | 1-6, 12-24 |
| X | WO 03/014344 A2 (VIRAGEN INC [US]; JERVIS KAREN [GB]; ROBERTSON COLIN [GB]; CONNER JOE) 20 February 2003 (2003-02-20) claims 1,14-18 | 1-6, 12-24 |

Further documents are listed in the continuation of Box C.

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

31 October 2006

Date of mailing of the international search report

31/01/2007

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

Strobel, Andreas

INTERNATIONAL SEARCH REPORT

International application No

PCT/EP2006/004767

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

| Category* | Citation of document, with indication, where appropriate, of the relevant passages | Relevant to claim No. |
|-----------|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|
| X | WHITTLE N ET AL: "EXPRESSION IN COS CELLS OF A MOUSE - HUMAN CHIMAERIC B72.3 ANTIBODY" PROTEIN ENGINEERING, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 1, no. 6, 1 December 1987 (1987-12-01), pages 499-505, XP000005250 ISSN: 0269-2139 the whole document | 1-6, 12-24 |
| P,A | ----- WO 2005/075514 A2 (LONZA AG [CH]; KALLMEIER ROBERT [GB]; REISS GILLES [CH]; GAY ROBERT [A] 18 August 2005 (2005-08-18) the whole document ----- | 1-24 |

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/EP2006/004767

| Patent document cited in search report | Publication date | Patent family member(s) | Publication date |
|----------------------------------------|------------------|--------------------------|------------------|
| WO 03014344 | A2 | 20-02-2003 EP 1417316 A2 | 12-05-2004 |
| WO 2005075514 | A2 | 18-08-2005 NONE | |