

(19) World Intellectual Property Organization
International Bureau



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

PCT

(10) International Publication Number
WO 2006/123097 A3

(51) International Patent Classification:
C12N 15/85 (2006.01)

(21) International Application Number:
PCT/GB2006/001656

(22) International Filing Date: 9 May 2006 (09.05.2006)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
0509965.0 17 May 2005 (17.05.2005) GB
60/682,277 18 May 2005 (18.05.2005) US

(71) Applicant (for all designated States except US): **SEROLOGICALS INVESTMENT COMPANY INC.** [US/US]; 5655 Spalding Drive, Norcross, GA 30092 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SIMPSON, David, John** [GB/GB]; 4 Picasso Drive, Meir Park, Stoke-on-Trent, Staffordshire ST3 7GF (GB). **WILLIAMS, Steven, Geraint** [GB/GB]; 17 Chidlow Close, Hough, Near Crewe, Cheshire CW2 5RE (GB). **IRVINE, Alistair, Simpson** [GB/GB]; 4 Maple Close, Doveridge, Derbyshire DE6 5LU (GB).

(74) Agent: **GODDARD, David, John**; Harrison Goddard Foote, Orlando House, 11c Compstall Road, Marple Bridge, Stockport SK6 5HH (GB).

(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, 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).

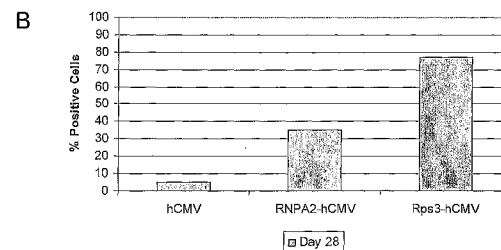
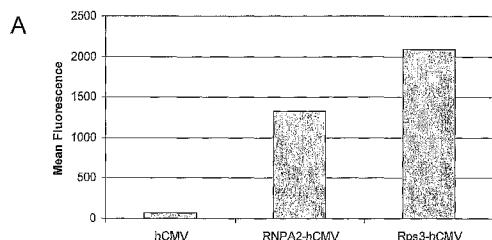
Published:

- 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:
11 January 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: IMPROVED EXPRESSION ELEMENTS



(57) Abstract: The invention relates to genetic elements capable of improving the levels of expression of operably-linked transcription units. In particular, said genetic elements are derived from the 5' untranslated regions of ribosomal protein genes and may comprise a CpG island. Also provided are vectors and host cells comprising said genetic elements and methods of use to obtain high levels of recombinant gene expression.



WO 2006/123097 A3

INTERNATIONAL SEARCH REPORT

International application No PCT/GB2006/001656

A. CLASSIFICATION OF SUBJECT MATTER
INV. C12N15/85

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)
C12N

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, PAJ, EMBASE, 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.
X	WO 02/081677 A (COBRA THERAPEUTICS LIMITED; ML LABORATORIES PLC) 17 October 2002 (2002-10-17) page 32; claims 1-64; figure 1	1-27
X	WO 02/099089 A (CORIXA CORPORATION; BENTON, TRISH; BEBBINGTON, CHRISTOPHER, ROBERT; HE) 12 December 2002 (2002-12-12) claims 1-48; figure 1; examples 1,2	1-27
X	WO 00/05393 A (COBRA THERAPEUTICS LIMITED; ANTONIOU, MICHAEL; CROMBIE, ROBERT) 3 February 2000 (2000-02-03) cited in the application claims 1-33	1-27
----- -/--		

<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>"&" document member of the same patent family</p>
--	--

Date of the actual completion of the international search 28 September 2006	Date of mailing of the international search report 30/10/2006
---	---

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 Vollbach, Silke
---	--

INTERNATIONAL SEARCH REPORT

International application No

PCT/GB2006/001656

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
P,X	<p>WILLIAMS STEVEN ET AL: "CpG-island fragments from the HNRPA2B1/CBX3 genomic locus reduce silencing and enhance transgene expression from the hCMV promoter/enhancer in mammalian cells" BMC BIOTECHNOLOGY, BIOMED CENTRAL LTD. LONDON, GB, vol. 5, no. 1, 3 June 2005 (2005-06-03), page 17, XP021005966 ISSN: 1472-6750 figures 1,5</p>	1-27
Y	<p>PONGER LOIC ET AL: "CpGProD: Identifying CpG islands associated with transcription start sites in large genomic mammalian sequences" BIOINFORMATICS (OXFORD), vol. 18, no. 4, April 2002 (2002-04), pages 631-633, XP002400746 ISSN: 1367-4803 the whole document</p>	1-27
Y	<p>TALBOT D ET AL: "THE 5' FLANKING REGION OF THE RAT LAP (C/EBPBETA) GENE CAN DIRECT HIGH-LEVEL, POSITION-INDEPENDENT, COPY NUMBER-DEPENDENT EXPRESSION IN MULTIPLE TISSUES IN TRANSGENIC MICE" NUCLEIC ACIDS RESEARCH, OXFORD UNIVERSITY PRESS, SURREY, GB, vol. 22, no. 5, 11 March 1994 (1994-03-11), pages 756-766, XP000867294 ISSN: 0305-1048 page 765</p>	1-27
X	<p>DATABASE EMBL [Online] 5 September 2001 (2001-09-05), "Mus musculus ribosomal protein S3 (Rps3) gene, complete cds; and U15a snoRNA and U15b snoRNA genes, complete sequence." XP002400749 retrieved from EBI accession no. EM_PRO:AY043296 Database accession no. AY043296 the whole document</p>	11
X	<p>DATABASE EMBL [Online] 15 May 2003 (2003-05-15), "H015I23S HO Hordeum vulgare cDNA clone H015I23 5-PRIME, mRNA sequence." XP002400750 retrieved from EBI accession no. EM_PRO:CD057580 Database accession no. CD057580 the whole document</p>	12

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2006/001656

Patent document cited in search report	Publication date	Patent family member(s)	Publication date	
WO 02081677	A	17-10-2002	AU 2002242872 A2	21-10-2002
			CA 2443275 A1	17-10-2002
			CN 1500147 A	26-05-2004
			EP 1373535 A2	02-01-2004
			JP 2005500019 T	06-01-2005
WO 02099089	A	12-12-2002	CA 2463310 A1	12-12-2002
			CN 1533432 A	29-09-2004
			EP 1402006 A1	31-03-2004
			JP 2004535189 T	25-11-2004
			WO 02099070 A2	12-12-2002
WO 0005393	A	03-02-2000	AU 771111 B2	11-03-2004
			AU 5053499 A	14-02-2000
			CA 2333852 A1	03-02-2000
			CN 1334878 A	06-02-2002
			EP 1098986 A2	16-05-2001
			JP 2002522027 T	23-07-2002
			JP 2005052149 A	03-03-2005
			MX PA01000830 A	04-06-2002