



(51) International Patent Classification:

C12N 7/01 (2006.01) C12N 15/10 (2006.01)

C12N 15/63 (2006.01) C12P 21/00 (2006.01)

C12N 15/33 (2006.01) C07K 14/01 (2006.01)

(21) International Application Number:

PCT/RU2012/000455

(22) International Filing Date:

13 June 2012 (13.06.2012)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

61/495,467 10 June 2011 (10.06.2011) US

11169634.0 10 June 2011 (10.06.2011) EP

PCT/EP2011/068381

20 October 2011 (20.10.2011) EP

PCT/EP2011/072406

12 December 2011 (12.12.2011) EP

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(81) Designated States (unless otherwise indicated, for every

kind of national protection available): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) Designated States (unless otherwise indicated, for every

kind of regional protection available): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report (Art. 21(3))

— with sequence listing part of description (Rule 5.2(a))

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

10 May 2013

(15) Information about Correction:

Previous Correction:

see Notice of 14 February 2013

(54) Title: RECOMBINANT DNA ELEMENTS FOR THE EXPRESSION OF RECOMBINANT PROTEINS IN A HOST CELL

(57) **Abstract:** Reagents and methods are provided that allow for art Improved expression of a recombinant protein. More specifically, the Introduction of recombinant DNA elements into a host cell allows for the increased expression of a recombinant protein, an improvement of the correct folding of said protein and an increase in cell viability and proliferation of the host cell. These recombinant DNA elements can be introduced into host cells, for example, via a recombinant baculovirus, which has incorporated said elements. The recombinant DNA elements include nucleic acids encoding transcriptional regulators, such as IE-0 and IE-1, transcriptional enhancer elements, such as the homologous region (hr) and promoters.



INTERNATIONAL SEARCH REPORT

International application No.

PCT/RU 2012/000455

A. CLASSIFICATION OF SUBJECT MATTER		<i>C12N 7/01 (2006.01)</i> <i>C12N 15/63 (2006.001)</i> <i>C12N 15/33 (2006.01)</i> <i>C12 N15/10 (2006.01)</i> <i>C12P 21/00 (2006.01)</i> <i>C07K 14/01 (2006.01)</i>
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 7/01 C12N 15/63 C12N 15/33 C12 N15/10 C12P 21/00 C07K 14/01		
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 practicable, search terms used) PubMed		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	WO 1995017515 A1 (UNIVERSITY TECHNOLOGIES INTERNATIONAL INC.), 29.06.1995, claims	1-44
A	LU L. et al. Reduced expression of the immediate-early protein IE0 enables efficient replication of Autographa californica multiple nucleopolyhedrovirus in poorly permissive Spodoptera littoralis cells, J Virol., 2003, v.77, no.1, pp. 535-545.	1-44
A	US 20080096813 A1 (REGENTS OF THE UNIVERSITY OF CALIFORNIA et al), 24.04.2008, claims	1-44
A	ISHIYAMA S. ET AL., High-level expression and improved folding of proteins by using the vp39 late promoter enhanced with homologous DNA regions, Biotechnol Lett., 2010, v.32, no.11, pp. 1637-1647	1-44
☐ 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 09 October 2012 (09.10.2012)		Date of mailing of the international search report 15 November 2012 (15.11.2012)
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INTERNATIONAL SEARCH REPORT

International application No.

PCT/RU 2012/000455

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:

According to Rule 13 of the Regulations under the PCT the claimed inventions does not meet the requirement of unity of invention, therefore independent claims 1, 7, 16, 23, 30, 35, 36, 38-41, 43 and 44 form several groups of inventions, which are not so linked as to form a single general inventive concept.

The special technical feature of independent claims 1, 7, 16, 23, 30, 35, 36, 38-41, 43 is a nucleic acid sequence encoding proteins IE-1, IE-0 and /or fragments thereof functioning as transcriptional regulators, wherein a nucleic acid containing the nucleotide sequence indicated in any of SEQ ID NO:1-5. This special technical feature is absent in claim 44.

The special technical feature of independent claim 44 is a nucleic acid sequence containing the nucleic acid sequence indicated in SEQ ID NO: 12, 14 or 15 functioning as a promoter in a recombinant baculovirus.

This special technical feature is absent in claims 1, 7, 16, 23, 30, 35, 36, 38-41, 43.

Hence, claims comprise 2 groups of inventions, namely:

- 1 invention – claims 1- 43
- 2 invention – claim 44

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 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 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 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.