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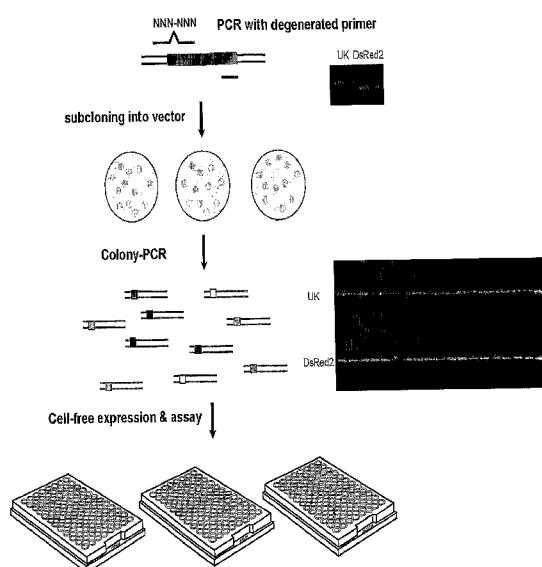
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[Continued on next page]

(54) Title: METHODS FOR SCREENING INITIAL CODONS PROVIDING DESIRED EXPRESSION LEVELS OF PROTEINS, AND METHODS FOR TUNING EXPRESSION AND PRODUCTION OF RECOMBINANT PROTEINS

[Fig. 1]



(57) Abstract: Disclosed herein is a method for screening an initial codon providing a desired expression level of a protein by changing randomly the initial codon of the gene, introducing the gene into a cell to isolate an individual gene and performing a colony polymerase chain reaction (PCR) to amplify the gene, and expressing the gene to a protein using the cell-free protein synthesis system; and a method for controlling the expression of the recombinant protein; and a method for preparing the recombinant protein by using same.



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- *before the expiration of the time limit for amending the claims and to be republished in the event of receipt of amendments (Rule 48.2(h))*
- *with sequence listing part of description (Rule 5.2(a))*
- (88) Date of publication of the international search report:**
23 December 2009

A. CLASSIFICATION OF SUBJECT MATTER*C12Q 1/68(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)

IPC: C12Q 1/68

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Korean Utility models and applications for Utility models since 1975

Japanese Utility models and applications for Utility models since 1975

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

KOMPASS (KIPO internal) & keywords: 'initial codon'

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	US 2004-0260060 A1 (CHEVALET, L.) 23 December 2004 See paragraph 0001 - paragraph 0065; and claims 1-21.	1 - 9
A	GONZALEZ, V. E. and ISAKSSON, L. A., 'A codon window in mRNA downstream of the initiation codon where NGG codons give strongly reduced gene expression in Escherichia coli.', Nucleic Acids Res., 2004, vol. 32, no. 17, pages 5198-5205. See abstract; materials and methods.	1 - 9
A	STENSTROM, C. M. et al., 'Influences on translation initiation and early elongation by the messenger RNA region flanking the initiation codon at the 3' side.', Gene., 17 April 2002, vol. 288, no. 1-2, pages 1-8. See abstract; materials and methods.	1 - 9
A	QING, G. et al., 'Enhancement of translation initiation by A/T-rich sequences downstream of the initiation codon in Escherichia coli.', J. Mol. Microbiol. Biotechnol., 2003, vol. 6, no. 3-4, pages 133-144. See abstract.	1 - 9
A	KR 10-0733712 B1 (THE INDUSTRY & ACADEMIC COOPERATION IN CHUNGNAM NATIONAL UNIVERSITY) 29 June 2007 See entire document.	1 - 9



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 application or patent 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 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

28 OCTOBER 2009 (28.10.2009)

Date of mailing of the international search report

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INTERNATIONAL SEARCH REPORT

International application No.

PCT/KR2009/001183

Box No. I Nucleotide and/or amino acid sequence(s) (Continuation of item 1.b of the first sheet)

1. With regard to any nucleotide and/or amino acid sequence disclosed in the international application, the international search was carried out on the basis of :

a. type of material



a sequence listing



table(s) related to the sequence listing

b. format of material



on paper



in electronic form

c. time of filing/furnishing



contained in the international application as filed



filed together with the international application in electronic form



furnished subsequently to this Authority for the purposes of search

2. ☐ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

3. Additional comments:

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No.

PCT/KR2009/001183

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