

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
13 July 2006 (13.07.2006)

PCT

(10) International Publication Number  
**WO 2006/073976 A3**

(51) International Patent Classification:  
C07H 21/04 (2006.01) C12P 21/02 (2006.01)

(21) International Application Number:  
PCT/US2005/047210

(22) International Filing Date:  
30 December 2005 (30.12.2005)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:  
60/640,107 30 December 2004 (30.12.2004) US

(71) Applicant (for all designated States except US): **LIFE-SENSORS, INC.** [US/US]; 271 Great Valley Parkway, Ste. 100, Malvern, Pennsylvania 19355 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **ZUO, Xun** [US/US]; 27 Sandy Lane, Malvern, Pennsylvania 19355 (US). **STERNER, David** [US/US]; 87 S. Lansdown Ave., Apt. A-1, Lansdown, Pennsylvania 19050 (US). **BUTT, Tauseef** [US/US]; 1650 Hidden Way, Malvern, Pennsylvania 19355 (US).

(74) Agent: **HEIMAN, Lee, C.**; Nath & Associated PLLC, 112 South West Street, Alexandria, Virginia 22314 (US).

(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).

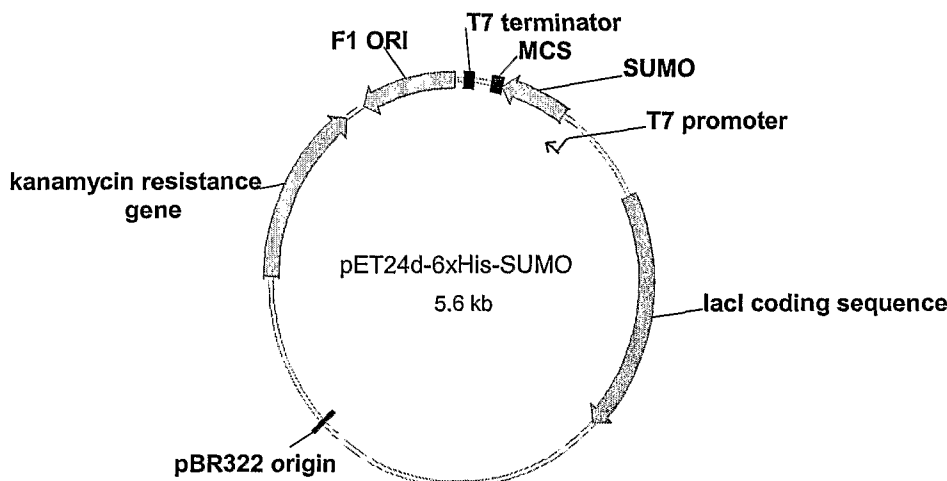
**Published:**

- 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:  
10 May 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: COMPOSITIONS, METHODS, AND KITS FOR ENHANCING PROTEIN EXPRESSION, SOLUBILITY AND ISOLATION



(57) Abstract: The inventive subject matter relates to novel compositions, methods, and kits for enhancing the expression, solubility, and isolation of heterologous proteins. Further, the inventive subject matter relates to methods for generating proteins with novel N-terminal amino acids, unlike wild-type proteins which always are translated from mRNA with methionine at the N-terminus.

WO 2006/073976 A3

INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/47210

A. CLASSIFICATION OF SUBJECT MATTER  
 IPC(8): C07H 21/04( 2006.01);C12P 21/02( 2006.01)

USPC: 536/23.4,23.5;435/320.1,69.1,70.1  
 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)  
 U.S. : 536/23.4, 23.5; 435/320.1, 69.1, 70.1

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)  
 Please See Continuation Sheet

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US 2003/0153045 A1 (BUTT et al) 14 August 2003 (14.08.2003), especially paragraphs [0058], [0064]-[0091] and Examples I-III.	1-86
Y	US 6,596,527 B1 (YEH et al.) 22 July 2003 (22.07.2003), especially columns 1-2, Example 3, Figure 3 and SEQ ID NOS: 1 and 7.	1-86

Further documents are listed in the continuation of Box C.  See patent family annex.

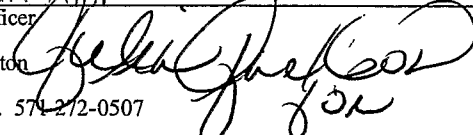
* Special categories of cited documents:		
"A" document defining the general state of the art which is not considered to be of particular relevance	"T"	later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
"E" earlier application or patent published on or after the international filing date	"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
"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)	"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
"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	"&"	document member of the same patent family

Date of the actual completion of the international search  
 05 March 2007 (05.03.2007)

Date of mailing of the international search report  
 22 MAR 2007

Name and mailing address of the ISA/US  
 Mail Stop PCT, Attn: ISA/US  
 Commissioner for Patents  
 P.O. Box 1450  
 Alexandria, Virginia 22313-1450  
 Facsimile No. (571) 273-3201

Authorized officer  
 Jennifer Dunston  
 Telephone No. 571-272-0507



**INTERNATIONAL SEARCH REPORT**

International application No.  
PCT/US05/47210

Continuation of B. FIELDS SEARCHED Item 3:  
EAST, PUBMED, GENEMBL, N\_GENESEQ, EST, ISSUED\_PATENTS\_NA, PUBLISHED\_APPLICATIONS\_NA\_MAIN,  
PUBLISHED\_APPLICATIONS\_NA\_NEW

search terms: sumo, sumo-3, SEQ ID NO: 42, SEQ ID NO: 43, fusion, chimers\$, heterologous