

(19) World Intellectual Property Organization
International Bureau



(43) International Publication Date
14 August 2008 (14.08.2008)

PCT

(10) International Publication Number
WO 2008/097802 A3

(51) International Patent Classification:
G01N 33/53 (2006.01)

(21) International Application Number:
PCT/US2008/052606

(22) International Filing Date: 31 January 2008 (31.01.2008)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
60/887,916 2 February 2007 (02.02.2007) US

(71) Applicant (for all designated States except US): **MEDICAL DISCOVERY PARTNERS LLC** [US/US]; 715 Albany Street, Boston, MA 021 18 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **SOMPURAM, Seshi, R.** [US/US]; 148 Winchester Road, Arlington, MA 02474 (US). **BOGEN, Steven, A.** [US/US]; 35 Cheryl Drive, Sharon, MA 02067 (US).

(74) Agents: **FOX, Harold, H.** et al; Steptoe & Johnson LLP, 1330 Connecticut Avenue, NW, Washington, DC 20036 (US).

(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, 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, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, SV, SY, 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, 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, HR, HU, IE, IS, IT, LT, LU, LV, MC, MT, NL, NO, 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:
16 October 2008

(54) Title: EPITOPE-MEDIATED ANTIGEN PREDICTION

(57) Abstract: There are many clinical instances in which, during the course of a disease, a patient may produce an antibody directed to unknown protein target(s). The targeted antigen(s) may be autoantigens (e.g., autoimmune diseases), microbial antigens (e.g., infectious diseases), allergens or, as in the case of B lymphoproliferative disorders and monoclonal gammopathies, antigens of unknown identity. When the antigen source is known or suspected, it may be feasible to construct a cDNA expression library and identify it. However, with no clues as to the antigen's origin, expression screening is impossible. We describe a new search strategy to overcome this limitation. We term the approach Epitope-Mediated Antigen Prediction (E-MAP). The technology enables one to link antibodies of unknown specificity to their cognate/target antigens in the protein database without requiring prior knowledge of their cellular source. We also describe a clinical application of the E-MAP technology to the study of multiple myeloma. In this study, we identified the protein target of paraproteins from a number of patients with multiple myeloma. These methods will be useful in biomarker discovery, clinical diagnostics, and therapeutic drug lead identification.



WO 2008/097802 A3

INTERNATIONAL SEARCH REPORT

International application No

PCT/US08/52606

A CLASSIFICATION OF SUBJECT MATTER IPC GOIN 33/53(2006 01) USPC 435/7 23 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 435/7 23 Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched Pubmed, Medline Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) peptide library phage library, peptide-antigen screening				
C DOCUMENTS CONSIDERED TO BE RELEVANT				
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No		
Y	WO/1991/019818 A1 (AFFYMAX TECHNOLOGIES N V) 26 December 1991 (26 12 1991), entire document	1-1 8		
Y	WITTENBERG et al Antibody and Antigen Binding Peptides Using a Phage Displayed Random Peptide Library Preparations of myoglobins In Methods in Enzymology, Vol 76, pp 29-39, Chapter 3, 1996	1-1 8		
☐ Further documents are listed in the continuation of Box C ☐ See patent family annex				
<table border="0"> <tr> <td> * 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 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 </td> <td> "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 </td> </tr> </table>			* 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 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
* 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 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 19 June 2008 (19 06 2008)		Date of mailing of the international search report 13 AUG 2008		
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 Larry Helms Telephone No 571-272-7222		