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Published:

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

(88) Date of publication of the international search report:
6 October 2011

(54) Title: A METHOD AND SYSTEM FOR THE DETECTION OF CANCER

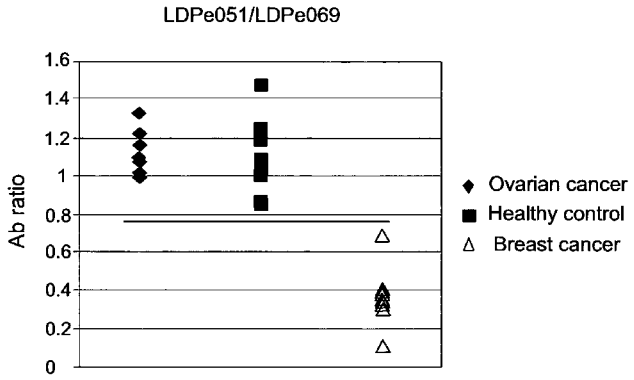

Figure 2B

(57) Abstract: Disclosed are a method and kit of diagnosis of cancer in a body sample of a subject, comprising contacting the sample with at least two different suitable antigens to form at least two different complexes with antibodies present in the sample, determining the actual levels of each of said antigen-antibody complexes in said sample and establishing the ratio between the levels of the different complexes in said subject; and comparing the ratio to a predetermined ratio between antigen-antibody complexes levels formed between the same at least two antigens and samples from healthy subjects, whereby if said ratio determined in step higher or lower than a predetermined cutoff point pre-established for healthy subjects, said subject is diagnosed with cancer. The method and kit can be used for diagnosing various types of cancer, including breast, ovary, lung, prostate and colon cancer.

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INTERNATIONAL SEARCH REPORT

International application No
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A. CLASSIFICATION OF SUBJECT MATTER
INV. G01N33/574 G01N33/68 G06F17/18
ADD.

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)
G01N G06F G01F

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, CHEM ABS Data, Sequence Search, BIOSIS, EMBASE

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WANG CHENG-CHI ET AL: "Glycan microarray of Globo H and related structures for quantitative analysis of breast cancer.", PROCEEDINGS OF THE NATIONAL ACADEMY OF SCIENCES OF THE UNITED STATES OF AMERICA 19 AUG 2008 LNKD- PUBMED:18689688, vol. 105, no. 33, 19 August 2008 (2008-08-19), pages 11661-11666, XP002613600, ISSN: 1091-6490	12
A	page 11664, column 1, paragraph 1; figures 3,5,7; tables 4-5 page 11665, column 2, last line	1-11,13, 14,17-22

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[X] Further documents are listed in the continuation of Box C.

[X] 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	Date of mailing of the international search report
9 December 2010	29/06/2011

Name and mailing address of the ISA/	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016	Vadot-Van Geldre, E

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Form PCT/ISA/210 (second sheet) (April 2005)

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CHEN GUOAN ET AL: "Autoantibody profiles reveal ubiquilin 1 as a humoral immune response target in lung adenocarcinoma.", CANCER RESEARCH 1 APR 2007 LNKD-PUBMED:17409457, vol. 67, no. 7, 1 April 2007 (2007-04-01), pages 3461-3467, XP002613601, ISSN: 0008-5472	12
A	page 3462, column 2, paragraph 1-2; figure 1 page 3464, column 2, paragraph 1 page 3462, column 2, paragraph 1-2	1-11,13, 14,17-22
A	crowther: "the elisa guidebook", 2001, humana press, totowa, new jersey, XP002613602, ISBN: 0896037282 pages 172-181, paragraph [3.7.2]; figures 11-13,15	1-14, 17-22
X	WO 2008/032084 A1 (ONCIMMUNE LTD [GB]; ROBERTSON JOHN FORSYTH RUSSELL [GB]; MURRAY ANDREA) 20 March 2008 (2008-03-20) claims 1-9; figures 1-7; example 4	1-14, 17-22
X	WO 02/072627 A2 (CALLISTOGEN AG [DE]; WREDE PAUL [DE]; WALDEN PETER [DE]; EICHLER-MERTE) 19 September 2002 (2002-09-19) page 8, line 8; claim 16; figures 1-2	12,17, 21,22
A	WO 00/61636 A2 (RES CORP TECHNOLOGIES INC [US]) 19 October 2000 (2000-10-19) example 6; table III	1-14, 17-22
A	WO 2009/074276 A2 (ROCHE DIAGNOSTICS GMBH [DE]; HOFFMANN LA ROCHE [CH]; KARL JOHANN [DE];) 18 June 2009 (2009-06-18) page 19, line 24 - page 20, line 8 page 32, line 17 - page 23, line 5	1-14, 17-22
A	GB 2 426 581 A (UNIV NOTTINGHAM [GB]; ONC IMMUNE LTD [GB]) 29 November 2006 (2006-11-29) claims 1-5; examples 2-4; table 3	1-14, 17-22

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INTERNATIONAL SEARCH REPORT

International application No.
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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:

see additional sheet

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 an 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.:

1-14, 17-22(all partially)

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-14, 17-22(all partially)

method of diagnosis of cancer in a subject based upon the presence of autoantibodies to antigens in a sample from said subject, the corresponding monitoring system, computer implemented method, computer program product and kit for performing the method, wherein at least one antigen is the antigen denoted by SEQ ID No 1 or Seq ID No 20. Sequence ID No 1 and 20 have been grouped together for search purposes because they both pertain to the same protein, namely Her2, also called Erbb2.

2-25. claims: 1-14, 17-22(all partially)

method of diagnosis of cancer in a subject based upon the presence of autoantibodies to antigens in a sample from said subject, the corresponding monitoring system, computer implemented method, computer program product and kit for performing the method, wherein at least one antigen is the antigen denoted by SEQ ID No 2 (invention 2), SEQ ID No 3 (invention 3),.. up to SEQ ID No 26 (invention 25)

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26. claims: 15, 16

method of encoding an antigen index based upon measurement of antigen-autoantibody complexes combined with mathematical methods, and the corresponding computer program product

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27. claims: 23-25

method of of determining a predicted optical density reading of antibody-antigen complexes and provides as a solution a method based upon 3 OD measurements combined with mathematical methods

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INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No
PCT/IL2010/000498

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		US 2008305476 A1	11-12-2008