These antibodies are used in the diagnosis and treatment of cancer.

[Continued on next page]
Published:
— with international search report (Art. 21(3))
— 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))

(88) Date of publication of the international search report: 22 September 2011

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

A. CLASSIFICATION OF SUBJECT MATTER

C07K 16/30(2006.01)i, A61K 39/35(2006.01)i, A61P 35/00(2006.01)i, G01N 33/574(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)

C07K 16/30; C07K 16/00

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

Japanese utility models and applications for utility models

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)
eKOMPASS(KIPO internal) & Keywords: cancer, autoantibody, monoclonal antibody

C. DOCUMENTS CONSIDERED TO BE RELEVANT

<table>
<thead>
<tr>
<th>Category*</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>FURANO, A. et al., 'Identification of a 220-kDa membrane tumor-associated antigen by human anti-UK114 monoclonal antibodies selected from the immunoglobulin repertoire of a cancer patient.' Experimental Cell Research, 15 March 1999, Vol. 247, Pages 441-450. See the abstract, materials and methods, and discussion.</td>
<td>2-8</td>
</tr>
<tr>
<td>A</td>
<td>US 6787638 B1 [WATKINS, JEFFRY D. et al.] 07 September 2004 See the abstract and claims.</td>
<td>2-8</td>
</tr>
<tr>
<td>A</td>
<td>HANSEN, M. M. et al., 'The tumor-infiltrating B cell response in medullary breast cancer is oligoclonal and directed against the autoantigen actin exposed on the surface of apoptotic cancer cells.' Proc. Natl. Acad. Sci. USA, 3 October 2001, vol. 98, No. 22, Pages 12659-12664. See the whole document.</td>
<td>2-8</td>
</tr>
<tr>
<td>A</td>
<td>RÖTLAN, B. et al., 'Novel ganglioside antigen identified by B cells in human medullary breast carcinomas: the proof of principle concerning the tumor-infiltrating B lymphocytes.' Journal of Immunology, 15 August 2005, vol. 175, No. 4, Pages 2278-2285. See the whole document.</td>
<td>2-8</td>
</tr>
</tbody>
</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 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

Further documents are listed in the continuation of Box C.

See patent family annex.

Date of the actual completion of the international search

26 JULY 2011 (26.07.2011)

Date of mailing of the international search report

27 JULY 2011 (27.07.2011)

Name and mailing address of the ISA/KR

Korean Intellectual Property Office
Government Complex-Daejeon, 189 Cheongsa-ro, Seo-gu, Daejeon 502-701, Republic of Korea
Facsimile No. 82-42-472-7140

Authorized officer

Kim, Jeong-Ah
Telephone No. 82-42-481-8747

Form PCT/ISA/210 (second sheet) (My 2009)
<table>
<thead>
<tr>
<th>Box No.</th>
<th>Nucleotide and/or amino acid sequence(s) (Continuation of item 1b of the first sheet)</th>
</tr>
</thead>
</table>

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. a sequence listing filed or furnished
      - [ ] on paper
      - [ ] in electronic form
   b. time of filing or 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 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

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.: 35-37
   because they relate to subject matter not required to be searched by this Authority, namely:
   Claims 35-37 pertain to methods for treatment or diagnosis of the human body by therapy, thus relate to a subject matter which this International Searching Authority is not required, under Article 17(2)(a)(i) of the PCT and Rule 39.1(iv) of the regulations under the PCT, to search.

2. ☒ Claims Nos.: 1, 31-37
   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:
   (continued on Supplemental Box)

3. ☒ Claims Nos.: 35
   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:

(Continued on Supplemental Box)

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 fee, this Authority did not invite payment of any additional fee.

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.: 1-8, 31-34

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.
Continuation of Box II:

Claims 1, 31 are directed to an antibody characterized by house name (i.e. 1061_116) which is too unclear because claims 1, 31 do not contain all the technical features essential to the definition of the invention (PCT Article 3, Rule 6.3(b)). Claims 32-37 directed to pharmaceutical compositions or methods characterized by the use of the unclear antibodies of claims 1 or 31 (PCT Article 3, Rule 6.3(b)).

Claim 36 is too unclear because claim 36 is a dependent claim of multiple dependent claims, which is not drafted in accordance with the second and the third sentences of Rule 6.4.
INTERNATIONAL SEARCH REPORT

Continuation of: Box III:

This International Searching Authority found multiple inventions in this international application, as follow:

Invention 1: An isolated monoclonal antibody named 1061_116 (TCN-462) comprising SEQ ID NO:1 and SEQ ID NO:3 and related inventions. (Claims 1-6, 31-34 partially; claims 7-8 as a whole)

Invention 2: An isolated monoclonal antibody named 1226_K16 comprising SEQ ID NO:5 and SEQ ID NO:7 and related inventions. (Claims 1-6, 31-34 partially; claims 9-10 as a whole)

Invention 3: An isolated monoclonal antibody named 1242_P11 comprising SEQ ID NO:9 and SEQ ID NO:11 and related inventions. (Claims 1-6, 31-34 partially; claims 11-12 as a whole)

Invention 4: An isolated monoclonal antibody named 1253_N12 comprising SEQ ID NO:13 and SEQ ID NO:15 and related inventions. (Claims 1-6, 31-34 partially; claims 13-14 as a whole)

Invention 5: An isolated monoclonal antibody named 1256_B2 comprising SEQ ID NO:17 and SEQ ID NO:19 and related inventions. (Claims 1-6, 31-34 partially; claims 15-16 as a whole)

Invention 6: An isolated monoclonal antibody named 1250_113 comprising SEQ ID NO:21 and SEQ ID NO:23 and related inventions. (Claims 1-6, 31-34 partially; claims 17-18 as a whole)

Invention 7: An isolated monoclonal antibody named 1252_B7 comprising SEQ ID NO:25 and SEQ ID NO:27 and related inventions. (Claims 1-6, 31-34 partially; claims 19-20 as a whole)

Invention 8: An isolated monoclonal antibody named 1248_C17 comprising SEQ ID NO:29 and SEQ ID NO:31 and related inventions. (Claims 1-6, 31-34 partially; claims 21-22 as a whole)

Invention 9: An isolated monoclonal antibody named 1247_A18 comprising SEQ ID NO:33 and SEQ ID NO:35 and related inventions. (Claims 1-6, 31-34 partially; claims 23-24 as a whole)

Invention 10: An isolated monoclonal antibody named 1252_013 comprising SEQ ID NO:37 and SEQ ID NO:39 and related inventions. (Claims 1-6, 31-34 partially; claims 25-26 as a whole)

Invention 11: An isolated monoclonal antibody named 1038_C (TCN-445) comprising SEQ ID NO:41 and SEQ ID NO:43 and related inventions. (Claims 1-6, 31-34 partially; claims 27-28 as a whole)

Invention 12: An isolated monoclonal antibody named 1261_P5 comprising SEQ ID NO:45 and SEQ ID NO:47 and related inventions. (Claims 1-6, 31-34 partially; claims 29-30 as a whole)

The invention listed as Inventions 1-12 do not relate to a single general inventive concept under PCT Rule 13.1 because under PCT 13.2 they lack the same or corresponding special feature (All antibody of each invention have different heavy chain and light chain variable regions in each other, also antigen of each antibodies is not identified in this application ). According to PCT Rule 13.2, unity of exists only when the same or corresponding feature is shared by all claimed invention.
<table>
<thead>
<tr>
<th>Category</th>
<th>Citation of document, with indication, where appropriate, of the relevant passages</th>
<th>Relevant to claim No.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Patent document cited in search report</td>
<td>Publication date</td>
<td>Patent family member(s)</td>
</tr>
<tr>
<td>----------------------------------------</td>
<td>-----------------</td>
<td>--------------------------</td>
</tr>
<tr>
<td>US 6787638 B1</td>
<td>07.09.2004</td>
<td>CA 2353703 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2005-0003469 A1</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 00-32635 A2</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 00-32635 A3</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 00-32635 A9</td>
</tr>
<tr>
<td></td>
<td></td>
<td>WO 00-32635 A3</td>
</tr>
</tbody>
</table>