HUMAN MONOCLONAL ANTIBODIES TO INFLUENZA M2 PROTEIN AND METHODS OF MAKING AND USING SAME.

Abstract: Human, humanized and chimeric monoclonal antibodies that bind to influenza M2 protein. The antibodies are useful for, among other things, treatment, diagnosis, purifying and isolating M2 or influenza virus, and identifying the presence of M2 or influenza virus in a sample or a subject.
INTERNATIONAL SEARCH REPORT

INTERNATIONAL SEARCH REPORT

A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : A61K 39/00, 39/395, 39/42, 39/145; C12Q 1/70
US CL : 424/130.1, 147.1, 184.1, 186.1, 192.1, 209.1; 435/5

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. : 424/130.1, 147.1, 184.1, 186.1, 192.1, 209.1; 435/5

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

<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>
</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

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

Date of the actual completion of the international search | Date of mailing of the international search report

Name and mailing address of the ISA/US
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Telephone No. 703-308-0196

Form PCT/ISA/210 (second sheet) (July 1998)
INTERNATIONAL SEARCH REPORT

Box I Observations where certain claims were found unsearchable (Continuation of Item 1 of first sheet)

This international report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claim Nos.:
   because they relate to subject matter not required to be searched by this Authority, namely:

2. ☐ Claim 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. ☐ Claim Nos.:
   because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

Box II Observations where unity of invention is lacking (Continuation of Item 2 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:
Please See Continuation 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 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.: 1-5, 8-32, 34-45, 49-81

Remark on Protest ☐ The additional search fees were accompanied by the applicant’s protest.
☐ No protest accompanied the payment of additional search fees.

Form PCT/ISA/210 (continuation of first sheet(1)) (July 1998)
BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING
This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claims 1-5, 8-32, 34-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 1.

Group II, claims 1-2, 6-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 2.

Group III, claims 1-2, 6-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 3.

Group IV, claims 1-2, 6-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 4.

Group V, claims 1-2, 6-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 5.

Group VI, claims 1-2, 6-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 6.

Group VII, claims 1-2, 6-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 7.

Group VIII, claims 1-2, 6-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 8.

Group IX, claims 1-2, 6-45 and 49-81, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 9.

Group X, claim 46, drawn to a non-human transgenic animal.

Group XI, claim 46, drawn to a transgenic plant.

Group XII, claims 47 and 48, drawn to nucleic acid.

Pursuant to 37 CFR 1.475(d), the ISA/US considers that where multiple products and processes are claimed, the main invention shall consist of the first invention of the category first mentioned in the claims and the first recited invention of each of the other categories related thereto. Accordingly, the main invention (Group I) comprises the first recited product, an antibody comprising SEQ ID NO: 1. Further pursuant to 37 CFR 1.475(d), the ISA/US considers that any feature which the subsequently recited products and methods share with the main invention does not constitute a special technical feature within the meaning of PCT Rule 13.2 and that each of such products and methods accordingly defines a separate invention. Groups 2-10 are drawn to antibodies having different amino acid sequences, SEQ ID NOS: 2-9, respectively, requiring separate searches. These antibodies are distinct products requiring separate sequence searches. Groups 11-13 are drawn to multiple products outside the main invention.
BOX II. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING
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Group VI, claims 1-2, 6-45 and 49-82, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 6.

Group VII, claims 1-2, 6-45 and 49-82, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 7.

Group VIII, claims 1-2, 6-45 and 49-82, drawn to an antibody and method of using the antibody, wherein the antibody comprises four or more contiguous amino acids in SEQ ID NO: 8.

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Group X, claim 46, drawn to a non-human transgenic animal.

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Continuation of B. FIELDS SEARCHED Item 3:
APS, CAS ONLINE, GENESEQ, SWISSPROT, SPTRMML
search terms: mikayama, wang, kato, cheroutre, antibody, influenza, m2, SEQ ID NO:1, treat, vaccine, passive, immunization