Abstract: The present invention encompasses FMDV vaccines or compositions. The vaccine or composition may be a vaccine or composition containing FMDV antigens. The invention also encompasses recombinant vectors encoding and expressing FMDV antigens, epitopes or immunogens which can be used to protect animals, in particular ovines, bovines, caprines, or porcines, against FMDV.
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:
10 November 2011

SM, TR), OAPI (BF, BJ, CF, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG). — with sequence listing part of description (Rule 5.2(a))
**INTERNATIONAL SEARCH REPORT**

**PCT/US2011/028115**

**C12N15/82**

**A61K39/135**

**A61K**

**C12N**

**EPO-Internal, BIOSIS, EMBASE, WPI Data, Sequence Search**

**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>
</tr>
</thead>
<tbody>
<tr>
<td>X</td>
<td>PAN ET AL:   &quot;Foliar extracts from transgenic tomato plants expressing the structural polyprotein, P1-2A, and protease, 3C, from foot-and-mouth disease virus elicit a protective response in guinea pigs&quot;, VETERINARY IMMUNOLOGY AND IMMUNOPATHOLOGY, ELSEVIER BV, AMSTERDAM, NL, vol. 121, no. 1-2, 12 December 2007 (2007-12-12), pages 83-90, XP022386813, ISSN: 0165-2427, DOI: 10.1016/J.VETIMM.2007.08.010 e.g. abstract; the whole document</td>
</tr>
<tr>
<td>Y</td>
<td>2-8, 11-14, 17, 19-21</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 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

Date of the actual completion of the international search: 10 May 2011

Date of mailing of the international search report: 21/09/2011

Name and mailing address of the ISA:
European Patent Office, P.B. 5816 Patentlaan 2 NL - 2280 HV Rijswijk
Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016

Authorized officer:
Gruber, Andreas
## 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.:
   - 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 64(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 fee, 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:

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.:

### 1-21(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.
### 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>A</td>
<td>WO 02/00251 AL (NERIAL SAS [FR]; KING ANDREW [GB]; BURMAN ALI SON [GB]; AUDONNET JEAN C) 3 January 2002 (2002-01-03) the whole document</td>
<td>1-21</td>
</tr>
<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>WO 0200251 AI</td>
<td>03-01-2002</td>
<td>AU 7067801 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>BR 0112071 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>CN 1440296 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>EP 1294400 AI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>FR 2810888 AI</td>
</tr>
<tr>
<td></td>
<td></td>
<td>JP 2004501874 A</td>
</tr>
<tr>
<td></td>
<td></td>
<td>US 2004001864 AI</td>
</tr>
</tbody>
</table>

Form PCT/ISA/210 (patent family annex) (April 2002)
This International Searching Authority found multiple (groups of) inventions in this international application, as follows:

1. claims: 1-21 (partially)

   A composition comprising an FMDV antigen, method according to claim 9,10,21, polypeptide according to claim 15, plasmid according to claim 16, host cell according to claim 18, plant according to claim 19, wherein the FMDV antigen is P1-3C and wherein duckweed is used to express the FMDV gene

2-7. claims: 1-21(partially)

   A composition comprising an FMDV antigen, method according to claim 9,10,21, polypeptide according to claim 15, plasmid according to claim 16, host cell according to claim 18, plant according to claim 19, wherein the FMDV antigen is any one of PI, VPO, VP1, VP3, VP2, or VP4 (each antigen being a separate invention, e.g. invention 2: PI; invention 3: VPO; ... invention 7: VP4) and wherein duckweed is used to express the FMDV gene

8. claims: 1-20(partially)

   A composition comprising an FMDV antigen, method according to claim 9,10,21, polypeptide according to claim 15, plasmid according to claim 16, host cell according to claim 18, plant according to claim 19, wherein the FMDV antigen is P1-3C and wherein a plant other than duckweed is used to express the FMDV gene

9-14. claims: 1-20(partially)

   A composition comprising an FMDV antigen, method according to claim 9,10,21, polypeptide according to claim 15, plasmid according to claim 16, host cell according to claim 18, plant according to claim 19, wherein the FMDV antigen is any one of PI, VPO, VP1, VP3, VP2, or VP4 (each antigen being a separate invention, e.g. invention 9: PI; invention 10: VPO; ... invention 14: VP4) and wherein a plant other than duckweed is used to express the FMDV gene