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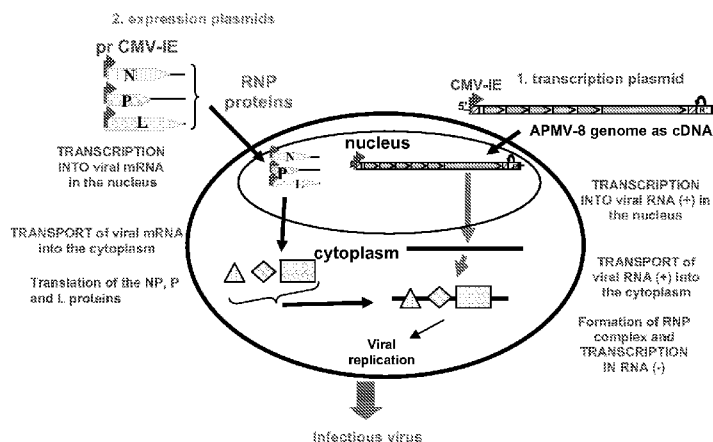
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[Continued on next page]

(54) Title: RECOMBINANT AVIAN PARAMYXOVIRUS VACCINE AND METHOD FOR MAKING AND USING THERE-OF

Figure 19A

### APMV-8 Reverse Genetics System



(57) Abstract: The present invention encompasses engineered APMV compositions or vaccines. The vaccine or composition may be a recombinant APMV composition or vaccine. The present invention encompasses methods for modifying the genome of APMV to produce recombinant APMV; modified APMV prepared by such methods; DNA and protein sequences; and methods for infecting cells and host animals with such recombinant APMV.

WO 2011/022656 A3

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5 May 2011

INTERNATIONAL SEARCH REPORT

International application No  
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<p>A. CLASSIFICATION OF SUBJECT MATTER INV. A61K39/155 C07K14/115 C12N15/86</p>		
<p>According to International Patent Classification (IPC) or to both national classification and IPC</p>		
<p>B. FIELDS SEARCHED</p>		
<p>Minimum documentation searched (classification system followed by classification symbols) A61K C07K C12N</p>		
<p>Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched</p>		
<p>Electronic data base consulted during the international search (name of data base and, where practical, search terms used) EPO-Internal, BIOSIS, EMBASE, WPI Data</p>		
<p>C. DOCUMENTS CONSIDERED TO BE RELEVANT</p>		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/36617 A2 (AKZO NOBEL NV [NL]; MEBATION TESHOMÉ [NL]; KOOLEN MARCUS JOSEPHUS MAR) 10 May 2002 (2002-05-10)	1,4, 12-14
Y	claims 1-22; examples 1-5 -----	2,3,5
X	PEETERS B P H ET AL: "Generation of a recombinant chimeric Newcastle disease virus vaccine that allows serological differentiation between vaccinated and infected animals" VACCINE, ELSEVIER LTD, GB LNKD- DOI:10.1016/S0264-410X(00)00419-9, vol. 19, 1 January 2001 (2001-01-01), pages 1616-1627, XP003013376 ISSN: 0264-410X	1,4, 12-14
Y	figures 1-3; tables 1,2 ----- -/--	2,3,5
<p><input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C.      <input checked="" type="checkbox"/> See patent family annex.</p>		
<p>* Special categories of cited documents :</p>		
<p>"A" document defining the general state of the art which is not considered to be of particular relevance</p> <p>"E" earlier document but published on or after the international filing date</p> <p>"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)</p> <p>"O" document referring to an oral disclosure, use, exhibition or other means</p> <p>"P" document published prior to the international filing date but later than the priority date claimed</p>		<p>"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</p> <p>"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</p> <p>"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.</p> <p>"&amp;" document member of the same patent family</p>
<p>Date of the actual completion of the international search  8 November 2010</p>		<p>Date of mailing of the international search report  10/03/2011</p>
<p>Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Fax: (+31-70) 340-3016</p>		<p>Authorized officer  Cilensek, Zoran</p>

# INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US2010/046179

## 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.:  
  
1-5, 12-14

### 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.

## INTERNATIONAL SEARCH REPORT

International application No  
PCT/US2010/046179

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 2007/104782 A1 (INTERVET INT BV [NL]; ROEMER-OBERDOERFER ANGELA [DE]; VEITS JUTTA [DE]) 20 September 2007 (2007-09-20)	1,4, 12-14
Y	examples 1-8	2,3,5
Y	----- PALDURAI A ET AL: "Complete genome sequences of avian paramyxovirus type 8 strains goose/Delaware/1053/76 and pintail/Wakuya/20/78" VIRUS RESEARCH, AMSTERDAM, NL LNKD-DOI:10.1016/J.VIRUSRES.2009.02.003, vol. 142, no. 1-2, 1 June 2009 (2009-06-01), pages 144-153, XP026083824 ISSN: 0168-1702 [retrieved on 2009-02-13] figures 1-6; tables 1-4	2,3,5
X	----- WO 2009/101149 A2 (BAYER SCHERING PHARMA AG [DE]; BEIER RUDOLF [DE]; PUEHLER FLORIAN [DE]) 20 August 2009 (2009-08-20)	1,2,4,12
Y	page 11 - page 12; claims 1-28 -----	2,3,5

# INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2010/046179

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 0236617	A2	10-05-2002	AT 352557 T 15-02-2007
			AU 2481502 A 15-05-2002
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			CN 101945660 A 12-01-2011
			EC SP100401 A 30-09-2010
			EP 2252307 A2 24-11-2010
			KR 20100122482 A 22-11-2010
			US 2009208495 A1 20-08-2009

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

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

1. claims: 1-5, 12-14

A composition or vaccine comprising (i) a recombinant APMV viral vector and (ii) a pharmaceutically or veterinarily acceptable carrier. A method for inducing an immunological response in an animal to an antigen comprising inoculating the animal with a composition or vaccine comprising a recombinant APMV viral vector, wherein the recombinant APMV viral vector comprises and expresses the antigen of a pathogen for said animal. Subject-matter related thereto.

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2. claims: 6-11

A method for producing recombinant APMV viral vector, wherein the method comprises the introduction into the APMV genome an isolated polynucleotide in a nonessential region of the APMV genome. Subject-matter related thereto.

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3. claims: 12-17(partially)

An isolated polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:1 or a polynucleotide complementary to a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO :1. An unmodified or modified APMV virus comprising said polynucleotide. Subject-matter related thereto.

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4. claims: 12-17(partially)

A polynucleotide having at least 90% sequence identity to a polynucleotide encoding a polypeptide having the sequence as set forth in SEQ ID NO:3, a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:2, or a polynucleotide complementary to a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:2. An unmodified or modified APMV virus comprising said polynucleotide.

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5. claims: 12-17(partially)

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

A polynucleotide having at least 90% sequence identity to a polynucleotide encoding a polypeptide having the sequence as set forth in SEQ ID NO:5, a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:4, or a polynucleotide complementary to a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:4. An unmodified or modified APMV virus comprising said polynucleotide.

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## 6. claims: 12-17(partially)

IA polynucleotide having at least 90% sequence identity to a polynucleotide encoding a polypeptide having the sequence as set forth in SEQ ID NO:7, a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:6, or a polynucleotide complementary to a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:6. An unmodified or modified APMV virus comprising said polynucleotide.

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## 7. claims: 12-17(partially)

A polynucleotide having at least 90% sequence identity to a polynucleotide encoding a polypeptide having the sequence as set forth in SEQ ID NO:9, a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:8, or a polynucleotide complementary to a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:8. An unmodified or modified APMV virus comprising said polynucleotide.

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## 8. claims: 12-17(partially)

A polynucleotide having at least 90% sequence identity to a polynucleotide encoding a polypeptide having the sequence as set forth in SEQ ID NO:11, a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:10, or a polynucleotide complementary to a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:10. An unmodified or modified APMV virus comprising said polynucleotide.

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## 9. claims: 12-17(partially)

**FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210**

A polynucleotide having at least 90% sequence identity to a polynucleotide encoding a polypeptide having the sequence as set forth in SEQ ID NO: 13, a polynucleotide having at least 90% sequence identity to a polynucleotide encoding a polypeptide having the sequence as set forth in SEQ ID NO:14, a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:12, or a polynucleotide complementary to a polynucleotide having at least 90% sequence identity to a polynucleotide having the sequence as set forth in SEQ ID NO:12. An unmodified or modified APMV virus comprising said polynucleotide.

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