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(71) Applicant (for all designated States except US): **IDEXX LABORATORIES, INC.** [US/US]; One Idexx Drive, Westbrook, Maine 04092 (US).

(72) Inventors; and

(75) Inventors/Applicants (for US only): **KRAH, Eugene, Regis, III** [US/US]; 3 Estes Drive, Freeport, Maine 04032 (US). **BEALL, Melissa** [US/US]; 4 Mountain View Road, Cape Elizabeth, Maine 04107 (US).

(74) Agent: **HILLMAN, Lisa, M., W.**; MCDONNELL BOEHNEN HULBERT & BERGHOFF LLP, 300 South Wacker Drive, Chicago, Illinois 60606 (US).

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(54) Title: *EHRlichia CANIS* DIVA (DIFFERENTIATE INFECTED FROM VACCINATED ANIMALS)

(57) Abstract: *Ehrlichia canis* antigens that can be used to differentiate *E. canis* infected animals from animals that have been challenged with *E. canis*, e.g., vaccinated against *E. canis*, are disclosed. The invention also provides compositions and methods for determining the presence of *E. canis* antigens and antibodies.

INTERNATIONAL SEARCH REPORT

International application No
PCT/US2006/012432

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07K14/29 G01N33/569 A61K39/02

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 G01N A61K

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, WPI Data, BIOSIS, Sequence Search

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 00/12688 A (WALKER D.H. ET AL.) 9 March 2000 (2000-03-09) page 3, lines 11-29 page 21, line 13 - page 22, line 25 claims 1-11 ----- -/--	1,2,5,6, 10,11, 13,16-20

Further documents are listed in the continuation of Box C.

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 31 January 2007	Date of mailing of the international search report 09/02/2007
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Name and mailing address of the ISA/ European Patent Office, P.B. 5818 Patentlaan 2 NL - 2280 HV Rijswijk Tel. (+31-70) 340-2040, Tx. 31 651 epo nl, Fax: (+31-70) 340-3016	Authorized officer Giry, Murielle
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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/012432

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	<p>YU X.-J. ET AL.: "Molecular cloning and characterization of the 120-kilodalton protein gene of Ehrlichia canis and application of the recombinant 120-kilodalton protein for serodiagnosis of canine ehrlichiosis." J. CLIN. MICROBIOL., vol. 38, no. 1, January 2000 (2000-01), pages 369-374, XP002975248 ISSN: 0095-1137 cited in the application abstract page 370, column 1, paragraph 5 - column 2, paragraph 2 page 373, column 2, lines 1-10 page 374, column 1, last paragraph</p>	1,2,5,6, 10,11, 13,16-20
X	<p>WO 2004/042037 A (MCBRIDE J.W. ET AL.) 21 May 2004 (2004-05-21) abstract page 18, line 27 - page 19, line 2 claims 6,15,17-20</p>	1-13,19, 20
X	<p>MCBRIDE J.W. ET AL.: "Immunodiagnosis of Ehrlichia canis infection with recombinant proteins" J. CLIN. MICROBIOL., vol. 39, no. 1, January 2001 (2001-01), pages 315-322, XP002311542 ISSN: 0095-1137 the whole document</p>	1-13,19, 20
X	<p>US 2004/121433 A1 (MCBRIDE J.W. ET AL.) 24 June 2004 (2004-06-24) cited in the application paragraphs [0004], [0029], [0030] claims 6,15-23</p>	1-15,19, 20
X	<p>US 2004/247616 A1 (WALKER D.H. ET AL.) 9 December 2004 (2004-12-09) the whole document</p>	3,7,9,12
X	<p>US 6 355 777 B1 (WALKER D.H. ET AL.) 12 March 2002 (2002-03-12) cited in the application the whole document</p>	3,7,9,12
X	<p>WO 03/089571 A2 (CHANG Y.-F.) 30 October 2003 (2003-10-30) the whole document</p>	3,7,9,12
A	<p>WO 98/42743 A (LETERME S. ET AL.) 1 October 1998 (1998-10-01) the whole document</p>	1-20

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INTERNATIONAL SEARCH REPORT

International application No

PCT/US2006/012432

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
T	<p>MAVROMATIS K ET AL: "The genome of the obligately intracellular bacterium Ehrlichia canis reveals themes of complex membrane structure and immune evasion strategies" J. BACTERIOL., vol. 188, no. 11, June 2006 (2006-06), pages 4015-4023, XP002406353 ISSN: 0021-9193 the whole document</p> <p>-----</p>	1-20

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US2006/012432

Box 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.: 19-20
because they relate to subject matter not required to be searched by this Authority, namely:

Although claims 19-20 are directed to a method of treatment of the human/animal body, the search has been carried out and based on the alleged effects of the compound/composition.
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 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 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.:

Remark on Protest

- The additional search fees were accompanied by the applicant's protest.
 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: 1-2,5-6,10-11,13-15,19-20 (in part), 3-4,7-9,12,16-18 (in total)

E. canis p120 kDa antigen (SEQ ID NOs: 2, 15, 16, 17) and its use as antigen for developing vaccines and serological diagnosis.

2. claims: 1-2, 5-6,10-11,13-15,19-20 (in part), 3-4,7-9,12 (in total)

E. canis p200 kDa antigen (SEQ ID NO: 4) and its use as antigen for developing vaccines and serological diagnosis.

3. claims: 1-2,5-6,10-11,13-15,19-20 (in part), 3-4,7-9,12 (in total)

E. canis ATPase antigen (SEQ ID NOs: 6 and 8) and its use as antigen for developing vaccines and serological diagnosis.

4. claims: 1-2,5-6,10-11,13-15,19-20 (in part), 3-4,7-9,12 (in total)

E. canis p16 kDa antigen, heat shock protein (SEQ ID NO: 10) and its use as antigen for developing vaccines and serological diagnosis.

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/US2006/012432

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