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(81) Designated States (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM,

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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))
- with (an) indication(s) in relation to deposited biological material furnished under Rule 13bis separately from the description (Rules 13bis.4(d)(i) and 48.2(a)(viii))

(88) Date of publication of the international search report:

24 March 2011

(54) Title: CANINE ORAL CAVITY PROBIOTICS

(57) Abstract: The present invention relates to a canine foodstuff or oral care product which comprises a canine oral cavity probiotic, as well as to probiotic strains deposited under the Budapest Treaty, antibodies raised against the strains and which specifically bind to the deposited strains, use of the strains to obtain antibodies, compositions comprising one or more of the probiotic strains and use of the compositions in medicine, a method of detecting the presence of one or more of the strains deposited, kits for detecting the presence of one or more of the strains deposited and a method of improving or maintaining canine oral health. The present invention also relates to other deposited micro-organisms and their use in identifying canine oral cavity probiotics.



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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2009/002618

A. CLASSIFICATION OF SUBJECT MATTER

INV. A23K1/18 A61K35/74 A61Q11/00 C07K16/12 C12Q1/04
C12R1/145 C12R1/36 C12R1/46 G01N33/569 A61P1/02

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)

A23K A61K A61Q C07K C12Q C12R G01N

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, BIOSIS, FSTA, WPI Data, 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, P	WO 2008/137541 A2 (MARS INC [US]; FORSYTH INST [US]; MARSHALL-JONES ZOE [GB]; BAILLON MAR) 13 November 2008 (2008-11-13)	8
Y	claims; sequences 6-8	1-8, 13-16,21

X	WO 2008/074473 A2 (BASF SE [DE]; REINDL ANDREAS [DE]; LANG CHRISTINE [DE]; BOETTNER MEWES) 26 June 2008 (2008-06-26)	1-3,21
Y	page 66, line 1 - line 15; claims; examples	13-16

X	US 2006/246015 A1 (HILLMAN JEFFREY D [US]) 2 November 2006 (2006-11-02)	1-3,21
Y	paragraphs [0005] - [0010], [0 15] - [0018], [0 36] - [0040]	13-16

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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

21 April 2010

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Name and mailing address of the ISA/

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INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2009/002618

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	TEUGHELIS W ET AL: "Guiding periodontal pocket recolonization: a proof of concept" JOURNAL OF DENTAL RESEARCH, INTERNATIONAL ASSOCIATION FOR DENTAL RESEARCH, US LNKD-DOI:10.1177/154405910708601111, vol. 86, no. 11, 1 November 2007 (2007-11-01), pages 1078-1082, XP008096925 ISSN: 0022-0345 page 1078, column 2 - page 1079, column 1 -----	1,21
X	DATABASE EMBL [Online] 26 February 2008 (2008-02-26), "Neisseria sp. VA252/2008 16S ribosomal RNA gene, partial sequence." XP002578641 retrieved from EBI accession no. EMBL:EU493160 Database accession no. EU493160 98,1% identity with SEQ ID NO 1,compound -----	8,13
Y	WO 2007/077210 A1 (WIKSTROEM MAUDE [SE]; ALMSTAAHL ANNICA [SE]) 12 July 2007 (2007-07-12) page 19, line 30 - page 20, line 5; claims -----	1-8, 13-16,21
A	DATABASE EMBL [Online] 20 December 2001 (2001-12-20), "Frigovirgula patagoniensis 16S ribosomal RNA gene, partial sequence." XP002578642 retrieved from EBI accession no. EMBL:AF450134 Database accession no. AF450134 92,3% identity with SEQ ID NO 2,compound -----	8
A,P	DATABASE EMBL [Online] 3 June 2009 (2009-06-03), "Uncultured bacterium clone nbw624d10c1 16S ribosomal RNA gene, partial sequence." XP002578643 retrieved from EBI accession no. EMBL:GQ111633 Database accession no. GQ111633 96,6% identitiy SEQ ID NO 2,compound ----- -/--	8

INTERNATIONAL SEARCH REPORT

International application No
PCT/GB2009/002618

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	ELLIOTT DAVID R ET AL: "Cultivable oral microbiota of domestic dogs" JOURNAL OF CLINICAL MICROBIOLOGY, AMERICAN SOCIETY FOR MICROBIOLOGY, WASHINGTON, DC, US LNKD- DOI:10.1128/JCM.43.11.5470-5476.2005, vol. 43, no. 11, 1 November 2005 (2005-11-01), pages 5470-5476, XP002497585 ISSN: 0095-1137 the whole document	1-8, 13-16,21
Y	----- DAEP CARLO AMORIN ET AL: "Interaction of Porphyromonas gingivalis with oral streptococci requires a motif that resembles the eukaryotic nuclear receptor box protein-protein interaction domain" INFECTION AND IMMUNITY, vol. 76, no. 7, July 2008 (2008-07), pages 3273-3280, XP002578644 ISSN: 0019-9567 page 3274	13-16
A	----- EP 0 225 254 A2 (FORVEST LTD [JP] GHEN CORP [JP]) 10 June 1987 (1987-06-10) cited in the application the whole document -----	1-8, 13-16,21

INTERNATIONAL SEARCH REPORT

International application No.
PCT/GB2009/002618

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.:

see additional sheet

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.

FURTHER INFORMATION CONTINUED FROM PCT/ISA/ 210

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

1. claims: 1-8(completely); 13-16, 21(partially)

The use of NCTC 13429 and/or NCTC 13431 or bacterial strains with a 16S rRNA gene sequence of 97% identity to the sequence set out in SEQ ID NO 1 or 2., in a foodstuff, oral care product or a pharmaceutical, including the use in dogs.

2. claims: 9-12(completely); 13-16, 21(partially)

An antibody or part thereof raised against the specific strains NCTC 13429 or NCTC 13431 or bacterial strains with a 16S rRNA gene sequence of 97% identity to the sequence set out in SEQ ID NO 1 or 2., or part thereof, and their use in a foodstuff, oral care product or a pharmaceutical.

3. claims: 17-20

A method of detecting the specific probiotic strains NCTC 13429 or NCTC 13431 or bacterial strains with a 16S rRNA gene sequence of 97% identity to the sequence set out in SEQ ID NO 1 or 2.

4. claims: 22, 23

Bacterial strains NCTC 13430 or NCTC 13428 or bacterial strains with a 16S rRNA gene sequence identical to the sequence set out in SEQ ID NO 3 or 4 and their use in identifying canine oral cavity probiotics in general (not limited to NCTC 13429 or NCTC 13431 or bacterial strains with a 16S rRNA gene sequence of 97% identity to the sequence set out in SEQ ID NO 1 or 2)

INTERNATIONAL SEARCH REPORT

Information on patent family members

International application No

PCT/GB2009/002618

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
WO 2008137541	A2	13-11-2008	NONE
WO 2008074473	A2	26-06-2008	AU 2007334850 A1 26-06-2008 CA 2671507 A1 26-06-2008 CN 101563447 A 21-10-2009 EP 2094830 A2 02-09-2009 JP 2010513350 T 30-04-2010 KR 20090096724 A 14-09-2009 US 2010047190 A1 25-02-2010
US 2006246015	A1	02-11-2006	NONE
WO 2007077210	A1	12-07-2007	AU 2007204037 A1 12-07-2007 CA 2636236 A1 12-07-2007 EP 1978979 A1 15-10-2008 JP 2009522330 T 11-06-2009 US 2009324547 A1 31-12-2009
EP 0225254	A2	10-06-1987	AU 600240 B2 09-08-1990 AU 6564886 A 28-05-1987 CA 1306946 C 01-09-1992 CH 225254 H1 15-09-1998 DE 3689717 D1 21-04-1994 DE 3689717 T2 20-10-1994 ES 2052496 T3 16-07-1994 US 5080895 A 14-01-1992