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(54) Title: GENOTYPE TEST FOR DOGS

(57) Abstract: The present invention provides a method for assessing a nutritional requirement, disease susceptibility or behavioural characteristic of a dog, the method comprising: (a) determining the nucleotide present at one or more SNP positions in the dog genome; (b) identifying therefrom the genetic breed inheritance of the dog; (c) thereby determining a nutritional requirement, disease susceptibility or behavioural characteristic of the dog.



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INTERNATIONAL SEARCH REPORT

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A. CLASSIFICATION OF SUBJECT MATTER IPC 7 C12Q1/68 C12N15/12 C07K14/47 A23K1/18		
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) IPC 7 C12Q C12N A23K		
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, WPI Data, PAJ, EMBASE, Sequence Search, CHEM ABS Data		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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Y	the whole document	17-23, 35-37
X	KIJAS J M H ET AL: "Detection of the causal mutation for canine leukocyte adhesion deficiency (CLAD) using pyrosequencing" ANIMAL GENETICS, vol. 31, no. 5, October 2000 (2000-10), pages 326-328, XP002297788 ISSN: 0268-9146	1-11, 14-16, 24,25, 27-29, 33,34
Y	the whole document	17-23, 35-37
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☒ Further documents are listed in the continuation of box C. ☒ Patent family members are listed in 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 4 January 2005		Date of mailing of the international search report 28.01.05
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 Morawetz, R

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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category °	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE BIOSIS 'Online! BIOSCIENCES INFORMATION SERVICE, PHILADELPHIA, PA, US; 2002, PEARCE-KELLING S E ET AL: "Test Matings Confirm Allelism Of prcd Across Many Dog Breeds." XP002297784 Database accession no. PREV200300165155	1-11, 14-16, 24,25, 27-29, 33,34
Y	the whole document & ARVO ANNUAL MEETING ABSTRACT SEARCH AND PROGRAM PLANNER, vol. 2002, 2002, page Abstract No. 3673, ANNUAL MEETING OF THE ASSOCIATION FOR RESEARCH IN VISION AND OPHTHALMOLOGY; FORT LAUDERDALE, FLORIDA, USA; MAY 05-10, 2002	17-23, 35-37
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Y	the whole document	17-23, 35-37
X	WO 01/08720 A (UNIV LELAND STANFORD JUNIOR) 8 February 2001 (2001-02-08) the whole document	1-11, 14-16, 24,25, 27-29, 33,34
X	SALAVAGGIONE ORESTE E ET AL: "Canine red blood cell thiopurine S-methyltransferase: Companion animal pharmacogenetics." PHARMACOGENETICS, vol. 12, no. 9, December 2002 (2002-12), pages 713-724, XP009036995 ISSN: 0960-314X	11,16,28
Y	the whole document	1-10,14, 15,24, 25,27, 29,33,34
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT		
Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
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X	----- IRION D N ET AL: "Analysis of genetic variation in 28 dog breed populations with 100 microsatellite markers." JOURNAL OF HEREDITY, vol. 94, no. 1, 1 February 2003 (2003-02-01), pages 81-87, XP009036762 ISSN: 0022-1503	11,16,28
Y	the whole document	1-10,14, 15,24, 25,27, 29,33,34
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	CAUGHEY G H ET AL: "Cloning and expression of the dog mast cell alpha-chymase gene." JOURNAL OF IMMUNOLOGY (BALTIMORE, MD. : 1950) 1 NOV 1997, vol. 159, no. 9, 1 November 1997 (1997-11-01), pages 4367-4375, XP002297781 ISSN: 0022-1767 the whole document	12,13
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P,X	MASUDA KOJI ET AL: "Breed differences in genotype and allele frequency of catechol O-methyltransferase gene polymorphic regions in dogs." JOURNAL OF VETERINARY MEDICAL SCIENCE, vol. 66, no. 2, February 2004 (2004-02), pages 183-187, XP002297782 ISSN: 0916-7250 the whole document	1-11, 14-16, 24,25, 27-29, 33,34
P,X	PARKER HEIDI G ET AL: "Genetic structure of the purebred domestic dog" SCIENCE (WASHINGTON D C), vol. 304, no. 5674, 21 May 2004 (2004-05-21), pages 1160-1164, XP002297783 ISSN: 0036-8075 the whole document	1-11, 14-16, 24,25, 27-29, 33,34
E	EP 1 454 915 A (PRESIDENT OF GIFU UNIVERSITY) 8 September 2004 (2004-09-08) the whole document	1-11, 14-16, 24,25, 27-29, 33,34
Y	US 2002/081356 A1 (BHATNAGAR SANDEEP ET AL) 27 June 2002 (2002-06-27) relevant to invention 22 the whole document	17-23, 35-37
Y	WO 02/102172 A (NESTLE PURINA PETCARE COMPANY) 27 December 2002 (2002-12-27) relevant to invention 22	17-23, 35-37
Y	US 6 524 609 B1 (MYERS ANDREW) 25 February 2003 (2003-02-25) relevant to invention 22 the whole document	17-23, 35-37
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C.(Continuation) DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	LAFOND E ET AL: "BREED SUSCEPTIBILITY FOR DEVELOPMENTAL ORTHOPEDIC DISEASES IN DOGS" JOURNAL OF THE AMERICAN ANIMAL HOSPITAL ASSOCIATION, AMERICAN ANIMAL HOSPITAL ASSOCIATION, MISHAWAKA,, US, vol. 38, no. 5, September 2002 (2002-09), pages 467-477, XP009036996 ISSN: 0587-2871 relevant to invention 22 the whole document	17-23, 35-37
P,X	SWANSON KELLY S ET AL: "Nutritional genomics: Implications for companion animals." JOURNAL OF NUTRITION, vol. 133, no. 10, October 2003 (2003-10), pages 3033-3040, XP002312349 ISSN: 0022-3166 relevant to invention 22 the whole document	17-23, 35-37

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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.: 26, 30-32
because they relate to subject matter not required to be searched by this Authority, namely:
Although claim 25 is 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.:
claims of invention 1 and invention 22
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:

Invention 1: claims 1-4, 11, 15, 16, 26-28, 30-34 (all completely), 5-10, 12-14, 24, 25, 29 (all partially)

A method for assessing a nutritional requirement, disease susceptibility or behavioural characteristic of a dog and a method of determining the genetic breed background of a dog.

1.1. claims: 1-4, 15, 26, 27, 33 (all completely), 6-10, 14, 24, 25, 29-32 (all partially)

A method for assessing a nutritional requirement, disease susceptibility or behavioural characteristic of a dog, and subject-matter related thereto.

1.2. claims: 5-10, 12-14, 24, 25, 29 (all partially)

A method according to any of claims 1-4, wherein the SNP position is the one identified in SEQ ID NO: 1, and subject-matter relating thereto.

1.3. claims: 11, 16, 28, 34 (all completely), 30-32 (all partially)

A method of determining the genetic breed background of a dog.

Inventions 2-21: claims 5-10, 12-14, 24, 25, 29 (all partially)

As for invention 1.2. but for SEQ ID NO: 4 to 23.

Invention 22: claims 17-23, 35-37

A method of preparing customised dog food, and subject-matter related thereto.

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