



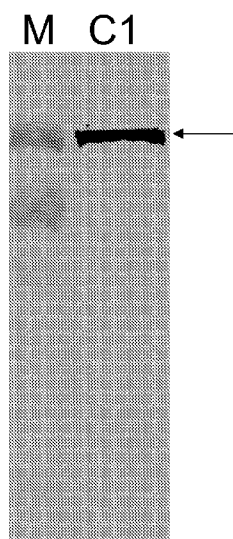
- (51) International Patent Classification:
C07K 14/08 (2006.01) C07K 14/005 (2006.01)
- (21) International Application Number:
PCT/DK2011/050269
- (22) International Filing Date:
8 July 2011 (08.07.2011)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:
10171394.9 30 July 2010 (30.07.2010) EP
61/369,284 30 July 2010 (30.07.2010) US
- (71) Applicants (for all designated States except US):
STATENS VETERINÄRMEDICINSKA

ANSTALT(SVA) [SE/SE]; Ulsväg 2B, S-751 89 Uppsala (SE). PELSDYRSERHVERVETS FORSØGS OG FORSKNINGSCENTER/KOPENHAGEN FUR [DK/DK]; Herningvej 112, DK-7500 Holstebro (DK). DANMARKS TEKNISKE UNIVERSITET [DK/DK]; Anker Engelundsvej 1, Bygning 101 A, DK-2800 Lyngby (DK).

- (72) Inventors; and
(75) Inventors/Applicants (for US only): BAULE, Claudia [SE/SE]; Gustaf Kjellbergsväg 28, S-75643 Uppsala (SE). BIDOKHTI, Mehdi [IR/SE]; Kronäsvägen 76B, rum 1303, S-75657 Uppsala (SE). ULLMAN, Karin [SE/SE]; Lapplandsresan 48, S-75755 Uppsala (SE). HAMMER, Anne, Sofie [DK/DK]; Poul Richards Vej 10, 1.tv., DK-2500 Valby (DK). CZIFRA, György [HU/IE]; 45 Abbey

[Continued on next page]

(54) Title: RECOMBINANT PROTEINS AS VACCINES FOR PROTECTION AGAINST DISEASE INDUCED BY INFECTION WITH MINK ASTROVIRUS



(57) Abstract: Pre-weaning diarrhoea, has been a problem in mink farms for many years. The "greasy kits" syndrome is a condition of newborn mink characterised by diarrhoea accompanied by skin swelling and redness, skin exudates and blackness of the nails. The present invention relates to polynucleotides and polypeptides of the capsid protein of a novel mink astrovirus strain denoted DK7627. Such polynucleotides and polypeptides may be used for the production of vaccines against mink astrovirus which may induce pre-weaning diarrhoea in minks. The invention furthermore relates to vectors, host cells, compositions and detection methods.

Fig. 5





View, Co. Meath, Trim (IE). **CHRIÉL, Mariann** [DK/DK]; Gerdrupvej 10, DK-2665 Vallensbæk Strand (DK). **DIETZ, Hans, Henrik** [DK/DK]; Højbakkegaards Allé, DK-2630 Taastrup (DK). **SANDBØL, Peter** [DK/DK]; Bachsvej 48, DK-7500 Holstebro (DK).

(74) **Agent: PLOUGMANN & VINGTOFT A/S**; Sundkrogs-gade 9, P. O. Box 831, DK-2100 Copenhagen Ø (DK).

(81) **Designated States** (*unless otherwise indicated, for every kind of national protection available*): AE, AG, AL, AM, AO, AT, AU, AZ, BA, BB, BG, BH, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IS, JP, KE, KG, KM, KN, KP, KR, KZ, LA, LC, LK, LR, LS, LT, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PE, PG, PH, PL, PT, RO, RS, RU, SC, SD, SE, SG, SK, SL, SM, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, ZA, ZM, ZW.

(84) **Designated States** (*unless otherwise indicated, for every kind of regional protection available*): ARIPO (BW, GH, GM, KE, LR, LS, MW, MZ, NA, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European (AL, AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HR, HU, IE, IS, IT, LT, LU, LV, MC, MK, MT, NL, NO, PL, PT, RO, RS, SE, SI, SK, SM, TR), OAPI (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

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 sequence listing part of description (Rule 5.2(a))*

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

21 June 2012

INTERNATIONAL SEARCH REPORT

International application No
PCT/DK2011/050269

A. CLASSIFICATION OF SUBJECT MATTER
INV. C07K14/08 C07K14/005
ADD.
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
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 practicable, search terms used)
EPO-Internal, BIOSIS, Sequence Search, WPI Data

C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	DATABASE EMBL [Online] 3 March 2003 (2003-03-03), "Mink astrovirus, complete genome.", XP002619615, retrieved from EBI accession no. EMBL:AY179509 Database accession no. AY179509 the whole document	1-16
X	----- MITTELHOLZER CHRISTIAN ET AL: "Molecular characterization of a novel astrovirus associated with disease in mink.", JOURNAL OF GENERAL VIROLOGY, vol. 84, no. 11, November 2003 (2003-11), pages 3087-3094, XP002619616, ISSN: 0022-1317 the whole document ----- -/--	1-16

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 application or patent 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 25 April 2012	Date of mailing of the international search report 10/05/2012
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	Authorized officer Wimmer, Georg

INTERNATIONAL SEARCH REPORT

International application No

PCT/DK2011/050269

C(Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	MITTELHOLZER CHRISTIAN ET AL: "Detection and sequence analysis of Danish and Swedish strains of mink astrovirus.", JOURNAL OF CLINICAL MICROBIOLOGY NOV 2003 LNKD- PUBMED:14605160, vol. 41, no. 11, November 2003 (2003-11), pages 5192-5194, XP002619617, ISSN: 0095-1137 the whole document	1-16
A	----- BASS DORSEY M ET AL: "Characterization of human serotype 1 astrovirus-neutralizing epitopes", JOURNAL OF VIROLOGY, vol. 71, no. 11, 1997, pages 8666-8671, XP002674748, ISSN: 0022-538X the whole document	9-12
A	----- WANG QIU-HONG ET AL: "Genetic analysis of the capsid region of astroviruses", JOURNAL OF MEDICAL VIROLOGY, vol. 64, no. 3, July 2001 (2001-07), pages 245-255, XP002674749, ISSN: 0146-6615 the whole document -----	9-12