

Title (en)
INFLUENZA VIRUS-LIKE PARTICLES (VLPs) COMPRISING HEMAGGLUTININ

Title (de)
INFLUENZA-VIRUS-LIKE-PARTIKEL (VLPs) MIT HÄMAGGLUTININ

Title (fr)
PARTICULES DE TYPE VIRUS (VLP) DE LA GRIPPE COMPRENANT DE L'HÉMAGGLUTININE

Publication
EP 2307549 A4 20110907 (EN)

Application
EP 09793741 A 20090702

Priority
• CA 2008001281 W 20080711
• CA 2009000032 W 20090112
• CA 2009000926 W 20090702

Abstract (en)
[origin: CA2730185A1] A method for synthesizing influenza virus-like particles (VLPs) within a plant or a portion of a plant is provided. The method involves expression of influenza HA of type A/California/04/09 in plants and the purification by size exclusion chromatography. The invention is also directed towards a VLP comprising influenza HA protein of type A/California/04/09 and plants lipids. The invention is also directed to a nucleic acid encoding influenza HA of type A/California/04/09 as well as vectors. The VLPs may be used to formulate influenza vaccines, or may be used to enrich existing vaccines.

IPC 8 full level
C12N 15/82 (2006.01); **A61K 39/145** (2006.01); **A61P 31/16** (2006.01); **A61P 37/04** (2006.01); **C07K 14/11** (2006.01); **C12N 7/01** (2006.01); **C12N 7/02** (2006.01); **C12N 15/29** (2006.01); **C12N 15/44** (2006.01)

CPC (source: EA EP KR)
A01H 5/00 (2013.01 - EA); **A61K 39/12** (2013.01 - EA EP); **A61K 39/145** (2013.01 - EA EP KR); **A61P 31/16** (2017.12 - EP); **A61P 37/04** (2017.12 - EP); **C07K 14/005** (2013.01 - EA EP); **C12N 7/00** (2013.01 - EA EP KR); **C12N 9/90** (2013.01 - EA); **C12N 15/82** (2013.01 - EA); **C12N 15/8257** (2013.01 - EA EP); **C12N 15/8258** (2013.01 - EA KR); **C12Y 503/04001** (2013.01 - EA); **G06F 9/505** (2013.01 - EA); **A61K 2039/5258** (2013.01 - EA EP KR); **A61K 2039/543** (2013.01 - EA EP); **A61K 2039/55505** (2013.01 - EA EP); **A61K 2039/55583** (2013.01 - EA EP); **A61K 2039/55588** (2013.01 - EA); **A61K 2039/58** (2013.01 - EA EP); **C07K 2319/02** (2013.01 - EA EP); **C07K 2319/03** (2013.01 - EA); **C12N 2760/16022** (2013.01 - EA KR); **C12N 2760/16122** (2013.01 - EA EP KR); **C12N 2760/16123** (2013.01 - EA EP KR); **C12N 2760/16133** (2013.01 - EA); **C12N 2760/16134** (2013.01 - EA EP KR); **C12N 2760/16151** (2013.01 - EA); **C12N 2760/16171** (2013.01 - EA); **C12N 2760/16222** (2013.01 - EA KR); **C12N 2760/16223** (2013.01 - EA KR); **C12N 2760/16234** (2013.01 - EA KR); **C12N 2830/65** (2013.01 - EP); **G06F 2209/508** (2013.01 - EA)

Citation (search report)
• [XY] WO 2004098533 A2 20041118 - THOMPSON BOYCE PLANT RES [US], et al
• [XY] MUSIYCHUK KONSTANTIN ET AL: "A launch vector for the production of vaccine antigens in plants", INFLUENZA AND OTHER RESPIRATORY VIRUSES, BLACKWELL PUBLISHING LTD, UK LNKD- DOI:10.1111/J.1750-2659.2006.00005.X, vol. 1, no. 1, 1 January 2007 (2007-01-01), pages 19 - 25, XP009058889, ISSN: 1750-2640, [retrieved on 20070119]
• [Y] PUSHKO ET AL: "Influenza virus-like particles comprised of the HA, NA, and M1 proteins of H9N2 influenza virus induce protective immune responses in BALB/c mice", VACCINE, ELSEVIER LTD, GB LNKD- DOI:10.1016/J.VACCINE.2005.07.098, vol. 23, no. 50, 30 December 2005 (2005-12-30), pages 5751 - 5759, XP005180698, ISSN: 0264-410X
• [Y] GRGACIC E V L ET AL: "Virus-like particles: Passport to immune recognition", METHODS : A COMPANION TO METHODS IN ENZYMOLOGY, ACADEMIC PRESS INC., NEW YORK, NY, US LNKD- DOI:10.1016/J.YMETH.2006.07.018, vol. 40, no. 1, 1 September 2006 (2006-09-01), pages 60 - 65, XP024908472, ISSN: 1046-2023, [retrieved on 20060901]
• [Y] SAINT-JORE-DUPAS ET AL: "From planta to pharma with glycosylation in the toolbox", TRENDS IN BIOTECHNOLOGY, ELSEVIER PUBLICATIONS, CAMBRIDGE, GB, vol. 25, no. 7, 1 July 2007 (2007-07-01), pages 317 - 323, XP022116342, ISSN: 0167-7799
• [XP] D'AOUST MARC-ANDRÉ ET AL: "Influenza virus-like particles produced by transient expression in Nicotiana benthamiana induce a protective immune response against a lethal viral challenge in mice.", PLANT BIOTECHNOLOGY JOURNAL DEC 2008 LNKD- PUBMED:19076615, vol. 6, no. 9, December 2008 (2008-12-01), pages 930 - 940, XP002598510, ISSN: 1467-7644
• [T] D'AOUST MARC-ANDRÉ ET AL: "The production of hemagglutinin-based virus-like particles in plants: a rapid, efficient and safe response to pandemic influenza", PLANT BIOTECHNOLOGY JOURNAL, vol. 8, no. 5, June 2010 (2010-06-01), pages 607 - 619, XP002598511, ISSN: 1467-7644
• See references of WO 2010003225A1

Cited by
RU2653756C2; US9815873B2; US11826419B2; US11833200B2

Designated contracting state (EPC)
AT BE BG CH CY CZ DE DK EE ES FI FR GB GR HR HU IE IS IT LI LT LU LV MC MK MT NL NO PL PT RO SE SI SK SM TR

DOCDB simple family (publication)
CA 2730185 A1 20100114; CA 2730185 C 20160209; AU 2009267759 A1 20100114; BR PI0915896 A2 20190924; CN 102272308 A 20111207; EA 034733 B1 20200313; EA 201001198 A1 20110630; EP 2307549 A1 20110413; EP 2307549 A4 20110907; EP 2570484 A1 20130320; EP 2570484 B1 20140910; ES 2525177 T3 20141218; IL 210215 A0 20110331; IL 210215 A 20131128; JP 2011527180 A 20111027; JP 5921884 B2 20160524; KR 101956910 B1 20190312; KR 20110034650 A 20110405; KR 20160049061 A 20160504; MX 2011000459 A 20110223; NZ 590144 A 20121130; RU 2011105073 A 20120820; SG 187500 A1 20130228; WO 2010003225 A1 20100114; WO 2010003225 A8 20100722

DOCDB simple family (application)
CA 2730185 A 20090702; AU 2009267759 A 20090702; BR PI0915896 A 20090702; CA 2009000926 W 20090702; CN 200980134868 A 20090702; EA 201001198 A 20090112; EP 09793741 A 20090702; EP 12181077 A 20090702; ES 12181077 T 20090702; IL 21021510 A 20101223; JP 2011516934 A 20090702; KR 20117001798 A 20090702; KR 20167010959 A 20090112; MX 2011000459 A 20090702; NZ 59014409 A 20090702; RU 2011105073 A 20090702; SG 2013004577 A 20090112