(19) Europäisches Patentamt
European Patent Office
Office européen des brevets

(11) **EP 2 839 040 B8**

(12) **CORRECTED EUROPEAN PATENT SPECIFICATION**

(15) Correction information:
Corrected version no 1 (W1 B1)
Corrections, see
Bibliography INID code(s) 73

(48) Corrigendum issued on:
29.05.2019 Bulletin 2019/22

(45) Date of publication and mention of the grant of the patent:
31.10.2018 Bulletin 2018/44

(21) Application number: **13717292.0**

(22) Date of filing: **19.04.2013**

(51) Int Cl.:
C12Q 1/70 *(2006.01)*

(86) International application number:
PCT/EP2013/058231

(87) International publication number:
WO 2013/156627 (24.10.2013 Gazette 2013/43)

(54) ANELLOVIRUS GENOME QUANTIFICATION AS A BIOMARKER OF IMMUNE SUPPRESSION

ANELLOVIRUS-GENOMQUANTIFIZIERUNG ALS EIN BIOMARKER VON IMMUNSUPPRESSION

QUANTIFICATION DE GÉNOME ANELLOVIRUS EN TANT QUE BIOMARQUEUR DE LA SUPPRESSION IMMUNITAIRE

(84) Designated Contracting States:
AL 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 RS SE SI SK SM TR

(30) Priority: **20.04.2012 EP 12305462**

(43) Date of publication of application:
25.02.2015 Bulletin 2015/09

(60) Divisional application:
18203560.0 / 3 483 290

(73) Proprietors:
- **Institut Pasteur**
  75015 Paris (FR)
- **Université Paris Descartes**
  75006 Paris (FR)
- **Assistance Publique - Hôpitaux de Paris**
  75004 Paris (FR)
- **PathoQuest**
  75013 Paris (FR)
- **Ecole Nationale Vétérinaire D'Alfort**
  94700 Maisons-Alfort (FR)

(72) Inventors:
- **ELOIT, Marc**
  75006 Paris (FR)
- **CHEVAL, Justine**
  75013 Paris (FR)
- **HEBERT, Charles**
  78800 Houilles (FR)
- **LECUIT, Marc**
  75014 Paris (FR)

(74) Representative: **Regimbeau**
20, rue de Chazelles
75847 Paris Cedex 17 (FR)

(56) References cited:
- **EVA MERETHE MOEN ET AL: "Effect of immune modulation on TT virus (TTV) and TTV-like-mini-virus (TLMV) viremia", JOURNAL OF MEDICAL VIROLOGY, vol. 70, no. 1, 1 May 2003 (2003-05-01), pages 177-182, XP055036372, ISSN: 0146-6615, DOI: 10.1002/jmv.10356**
- **CHRIS D MADSEN ET AL: "TTV viral load as a marker for immune reconstitution after initiation of HAART in HIV-infected patients.", HIV CLIN TRIALS, vol. 3, no. 4, 1 January 2002 (2002-01-01) , pages 287-295, XP055036246,**

Printed by Jouve, 75001 PARIS (FR)

(Cont. next page)

- F. MAGGI ET AL: "Torque Teno Virus Viremia Load Size in Patients with Selected Congenital Defects of Innate Immunity", CLINICAL AND VACCINE IMMUNOLOGY, vol. 18, no. 4, 1 April 2011 (2011-04-01), pages 692-694, XP055036238, ISSN: 1556-6811, DOI: 10.1128/CVI.00466-10
- SHIBAYAMA T ET AL: "Inverse relationship between the titre of TT virus DNA and the CD4 cell count in patients infected with HIV", AIDS, LONDON, GB, vol. 15, no. 5, 30 March 2001 (2001-03-30) , pages 563-570, XP009162224, ISSN: 0269-9370
- JELCIC I ET AL: "Isolation of multiple TT virus genotypes from spleen biopsy tissue from a Hodgkin's disease patient: Genome reorganization and diversity in the hypervariable region", JOURNAL OF VIROLOGY, THE AMERICAN SOCIETY FOR MICROBIOLOGY, US, vol. 78, no. 14, 1 January 2004 (2004-01-01), pages 7498-7507, XP002463335, ISSN: 0022-538X, DOI: 10.1128/JVI.78.14.7498-7507.2004
- DE VILLIERS ETHEL-MICHELE ET AL: "The Diversity of Torque Teno Viruses: In Vitro Replication Leads to the Formation of Additional Replication-Competent Subviral Molecules", JOURNAL OF VIROLOGY, THE AMERICAN SOCIETY FOR MICROBIOLOGY, US, vol. 85, no. 14, 1 July 2011 (2011-07-01), pages 7284-7295, XP009153737, ISSN: 0022-538X, DOI: 10.1128/JVI.02472-10
- OKAMOTO H ET AL: "Marked Genomic Heterogeneity and Frequent Mixed Infection of TT Virus Demonstrated by PCR with Primers from Coding and Noncoding Regions", VIROLOGY, ACADEMIC PRESS,ORLANDO, US, vol. 259, no. 2, 5 July 1999 (1999-07-05), pages 428-436, XP004439886, ISSN: 0042-6822, DOI: 10.1006/VIRO.1999.9770
- FABRIZIO MAGGI ET AL: "TT virus loads and lymphocyte subpopulations in children with acute respiratory diseases.", JOURNAL OF VIROLOGY, vol. 77, no. 16, 1 August 2003 (2003-08-01), pages 9081-9083, XP055036247, ISSN: 0022-538X
- BIAGINI P ET AL: "Comparison of systems performance for TT virus detection using PCR primer sets located in non-coding and coding regions of the viral genome.", JOURNAL OF CLINICAL VIROLOGY : THE OFFICIAL PUBLICATION OF THE PAN AMERICAN SOCIETY FOR CLINICAL VIROLOGY AUG 2001, vol. 22, no. 1, August 2001 (2001-08), pages 91-99, ISSN: 1386-6532
- H. Okamoto: "History of Discoveries and Pathogenicity of TT Viruses", 2009, E.-M. de Villiers, H. zur Hausen, Berlin Heidelberg ISBN: 978-3-540-70971-8 pages 1-20,
- NINOMIYA MASASHI ET AL: "Development of PCR assays with nested primers specific for differential detection of three human anelloviruses and early acquisition of dual or triple infection during infancy.", JOURNAL OF CLINICAL MICROBIOLOGY FEB 2008, vol. 46, no. 2, February 2008 (2008-02), pages 507-514, ISSN: 1098-660X
- THOM K ET AL: "Progression towards AIDS leads to increased Torque teno virus and Torque teno minivirus titers in tissues of HIV infected individuals.", JOURNAL OF MEDICAL VIROLOGY JAN 2007, vol. 79, no. 1, January 2007 (2007-01), pages 1-7, ISSN: 0146-6615
- MOEN EVA M ET AL: "Real-time PCR methods for independent quantitation of TTV and TLMV.", JOURNAL OF VIROLOGICAL METHODS JUN 2002, vol. 104, no. 1, June 2002 (2002-06), pages 59-67, ISSN: 0166-0934

Remarks:

The file contains technical information submitted after the application was filed and not included in this specification