(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
6 October 2011 (06.10.2011)

PCT

(10) International Publication Number
WO 2011/120994 A1

(51) International Patent Classification:
A61K 39/00 (2006.01) *C07K 14/145* (2006.01)
C07K 14/11 (2006.01) *C07K 14/44* (2006.01)

(21) International Application Number:
PCT/EP2011/054866

(22) International Filing Date:
29 March 2011 (29.03.2011)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
10305317.9 29 March 2010 (29.03.2010) EP

(71) Applicants *(for all designated States except US)*: **INSERM (INSTITUT NATIONAL DE LA SANTE ET DE LA RECHERCHE MEDICALE)** [FR/—]; 101, rue de Tolbiac, F-75013 Paris (FR). **CENTRE NATIONAL DE LA RECHERCHE SCIENTIFIQUE - CNRS** [FR/—]; 3, rue Michel Ange, F-75016 Paris 16 (FR). **UNIVERSITE PIERRE ET MARIE CURIE (PARIS 6)** [FR/—]; 4, Place Jussieu, F-75005 Paris (FR). **ASSISTANCE PUBLIQUE HOPITAUX DE PARIS** [FR/FR]; 3 Avenue Victoria, F-75004 Paris (FR). **CONSEJO NACIONAL DE INVESTIGACIONES CIENTIFICAS Y TECNICAS (CONICET)** [AR/AR]; Avenida Rivadavia 1917, Buenos Aires, C1033AAJ (AR). **UNIVERSIDAD CATOLICA DE CORDOBA (UCC)** [AR/AR]; Calle Obispo Trejo 323, Cordoba, 5000 (AR).

(72) Inventors; and

(75) Inventors/Applicants *(for US only)*: **KLATZMANN, David** [FR/FR]; I3:Immunology-Immunopathology-Immunotherapy - UMR7211(CNRS),U959(INSERM), Bât.CERVI, CHU Pitié-Salpêtrière, 83, bld de l'Hôpital, F-75651 Paris Cedex 13 (FR). **PIAGGIO, Eliane** [AR/FR]; I3:Immunology-Immunopathology-Immunotherapy - UMR7211(CNRS),U959(INSERM), Bât.CERVI, CHU Pitié-Salpêtrière, 83, bld de l'Hôpit, F-75651 Paris Cedex 13 (FR). **LUJAN, Hugo** [AR/AR]; Lagos Garcia 1248, Cordoba, 5009 (AR).

(74) Agents: **NIEMANN, Frédéric** et al.; Cabinet Plasseraud, 52 rue de la Victoire, F-75440 Paris Cedex 09 (FR).

(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))*

WO 2011/120994 A1

(54) Title: PHARMACEUTICAL COMPOSITIONS COMPRISING A POLYPEPTIDE COMPRISING AT LEAST ONE CXXC MOTIF AND HETEROLOGOUS ANTIGENS AND USES THEREOF

(57) Abstract: The invention relates to pharmaceutical compositions using a polypeptide comprising at least one CXXC motif, such as *Giardia* parasite's variable surface proteins (VSP) or a fragment thereof to raise by oral or mucosal vaccination an immune response against a heterologous selected antigen, such as tumor antigen, microbial antigen or other antigen.