

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
21 October 2021 (21.10.2021)



(10) International Publication Number
WO 2021/211760 A1

- (51) **International Patent Classification:**
A61K 39/215 (2006.01) *A61P 31/14* (2006.01)
- (21) **International Application Number:**
PCT/US2021/027355
- (22) **International Filing Date:**
14 April 2021 (14.04.2021)
- (25) **Filing Language:** English
- (26) **Publication Language:** English
- (30) **Priority Data:**
63/009,907 14 April 2020 (14.04.2020) US
63/084,421 28 September 2020 (28.09.2020) US
- (71) **Applicant: THE REGENTS OF THE UNIVERSITY OF CALIFORNIA** [US/US]; 1111 Franklin Street, Twelfth Floor, Oakland, CA 94607-5200 (US).
- (72) **Inventor: BENMOHAMED, Lbachir**; University of California, Irvine, Hewitt Hall Room 2032, Irvine, CA 92697 (US).
- (74) **Agent: NGUYEN, Quan**; Nguyen & Tarbet, 4199 Campus Drive, Suite 550, Irvine, CA 92612 (US).
- (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, BN, BR, BW, BY, BZ, CA, CH, CL, CN, CO, CR, CU, CZ, DE, DJ, DK, DM, DO,

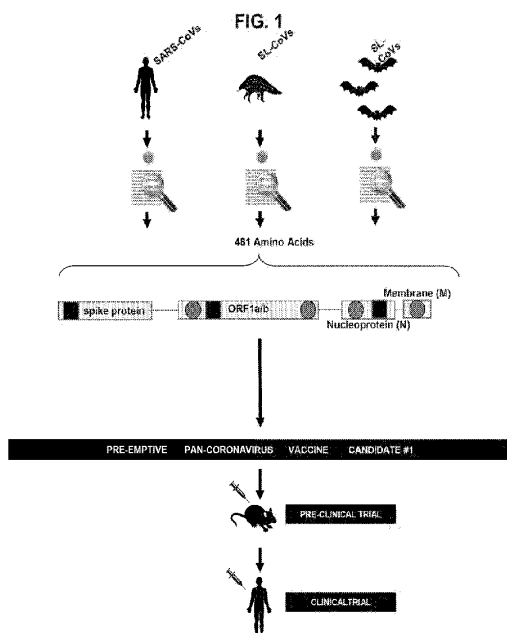
DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IR, IS, IT, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, ME, MG, MK, MN, MW, MX, MY, MZ, NA, NG, NI, NO, NZ, OM, PA, PE, PG, PH, PL, PT, QA, RO, RS, RU, RW, SA, SC, SD, SE, SG, SK, SL, ST, SV, SY, TH, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, WS, 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, RW, SD, SL, ST, SZ, TZ, UG, ZM, ZW), Eurasian (AM, AZ, BY, KG, KZ, 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, KM, 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))

(54) **Title:** LARGE SEQUENCE PAN-CORONAVIRUS VACCINE COMPOSITIONS



(57) **Abstract:** Pan-coronavirus vaccines for inducing efficient, powerful and long-lasting protection against all Coronaviruses infections and diseases, comprising multiple highly conserved large sequences which may comprise one or more conserved B, CD4 and CDS T cell epitopes that help provide multiple targets for the body to develop an immune response for preventing a Coronavirus infection and/or disease. In certain embodiments, the large sequences are conserved proteins or large sequences, e.g., sequences that are highly conserved among human coronaviruses and/or animal coronaviruses (e.g., coronaviruses isolated from animals susceptible to coronavirus infections).



WO 2021/211760 A1