



(51) International Patent Classification:

A61K 39/12 (2006.01) C07K 14/005 (2006.01)
A61P 31/14 (2006.01)

(21) International Application Number:

PCT/US2021/058989

(22) International Filing Date:

11 November 2021 (11.11.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/113,686 13 November 2020 (13.11.2020) US

(71) Applicant: **ICOSAVAX, INC.** [US/US]: 1616 Eastlake Avenue E, Suite 208, Seattle, Washington 98102 (US).

(72) Inventors; and

(71) Applicants: **FELDHaus, Andrew Lawrence**; c/o Icosavax, Inc., 1616 Eastlake Avenue E, Suite 208, Seattle, Washington 98102 (US). **HOLTZMAN, Douglas Andrew**

[US/US]; c/o Icosavax, Inc., 1616 Eastlake Avenue E, Suite 208, Seattle, Washington 98102 (US). **WOLF, Clancey Buchanan** [US/US]; c/o Icosavax, Inc., 1616 Eastlake Avenue E, Suite 208, Seattle, Washington 98102 (US).

(74) Agent: **CHRISTIANSEN II, William T.** et al.; Cooley LLP, 1299 Pennsylvania Avenue, NW, Suite 700, Washington, District of Columbia 20004-2400 (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.

(54) Title: PROTEIN-BASED NANOPARTICLE VACCINE FOR METAPNEUMOVIRUS

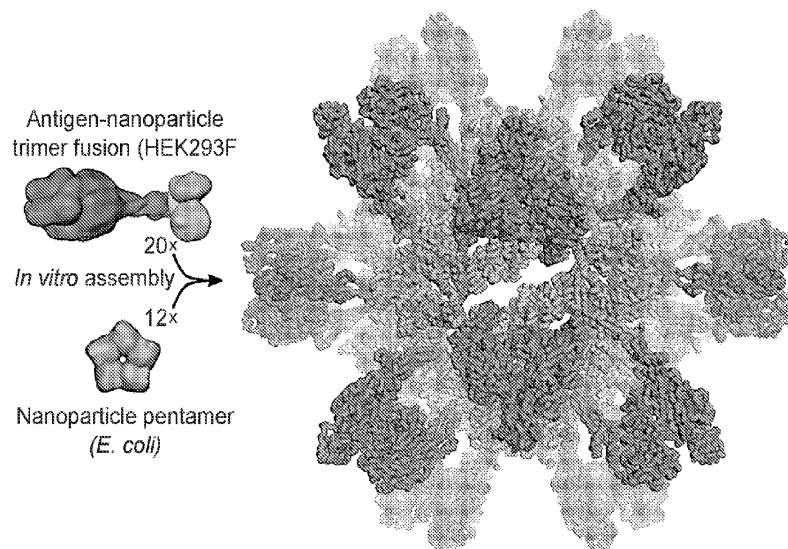


FIG. 1A

(57) Abstract: Provided are virus-like particle vaccines for human metapneumovirus (hMPV) in which the ectodomain of hMPV F protein is linked to, and thereby displayed on, a symmetric protein-based virus-like particle. For example, the vaccine antigen may be a N-terminal fusion of the ectodomain of hMPV F protein to a protein having a multimerization domain for a one- or two-component virus-like particle, such as a two-component icosahedral virus-like particle. Further provided are vaccine compositions, methods of manufacturing, and methods of use, e.g., immunizing a subject to generate a protective immune response to hMPV.

[Continued on next page]

(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).

Declarations under Rule 4.17:

- *as to applicant's entitlement to apply for and be granted a patent (Rule 4.17(ii))*
- *as to the applicant's entitlement to claim the priority of the earlier application (Rule 4.17(iii))*

Published:

- *with international search report (Art. 21(3))*
- *with sequence listing part of description (Rule 5.2(a))*