



## (51) International Patent Classification:

*A61K 39/015* (2006.01) *A61P 33/06* (2006.01)*A61K 39/39* (2006.01)

## (21) International Application Number:

PCT/JP2020/041583

## (22) International Filing Date:

06 November 2020 (06.11.2020)

## (25) Filing Language:

English

## (26) Publication Language:

English

## (30) Priority Data:

63/000,639 27 March 2020 (27.03.2020) US

(71) Applicants: **PATH** [US/US]; 2201 Westlake Avenue, Suite 200, Seattle, Washington, 98121 (US). **NATIONAL UNIVERSITY CORPORATION EHIME UNIVERSITY** [JP/JP]; 10-13, Dogo-himata, Matsuyama-shi, Ehime, 7908577 (JP). **SUMITOMO DAINIPPON PHARMA CO., LTD.** [JP/JP]; 6-8, Dosho-machi 2-chome, Chuo-ku, Osaka-shi, Osaka, 5418524 (JP).

(72) Inventors: **KING, C. Richter**; 1840 Park Road NW, Washington, District of Columbia, 20010 (US). **WU, Yimin**; 18133 Coachmans Road, Germantown, Maryland, 20874 (US). **PLIESKATT, Jordan Lee**; 624 N Colum-

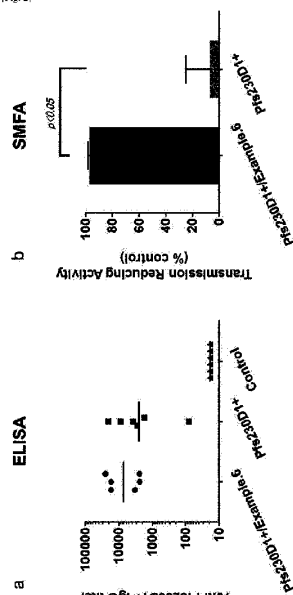
bus Street Alexandria, Virginia, 22314 (US). **LEE, Shwu-Maan**; 17054 Catalpa Court Rockville, Maryland, 20855 (US). **WU, Chia-Kuei**; 6 Elmwood Ct. Rockville, Maryland, 20850 (US). **TSUBOI, Takafumi**; c/o PROTEO-SCIENCE CENTER, NATIONAL UNIVERSITY CORPORATION EHIME UNIVERSITY, 3, Bunkyo-cho, Matsuyama-shi, Ehime, 7908577 (JP). **FUKUSHIMA, Akihisa**; c/o Sumitomo Dainippon Pharma Co., Ltd., 1-98, Kasugadenaka 3-chome, Konohana-ku, Osaka-shi, Osaka, 5540022 (JP).

(74) Agent: **YAMAO, Norihito** et al.; AOYAMA & PARTNERS, Umeda Hankyu Bldg. Office Tower, 8-1, Kaku-da-cho, Kita-ku, Osaka-shi, Osaka, 5300017 (JP).

(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: MALARIA TRANSMISSION-BLOCKING VACCINES

[Fig. 2]



(57) Abstract: Malaria transmission-blocking vaccines with good preservation stability and immunostimulatory action are provided. According the present invention, combination use of a pharmaceutical composition comprising (4E,8E,12E,16E,20E)-N-{2-[(4-[(2-amino-4-[(3S)-1-hydroxyhexan-3-yl]amino)-6-methylpyrimidin-5-yl)methyl]benzyl(methyl)amino]ethyl}-4,8,12,17,21,25-hexamethylhexacos-4,8,12,16,20,24-hexaeneamide, or a pharmaceutically acceptable salt thereof, as a vaccine adjuvant with enhanced specific immune response against antigens and good preservation stability and a malaria vaccine with non-glycosylation, homogeneity, and biological activity allow for the provision of malaria transmission-blocking vaccines with good preservation stability and immunostimulatory action.

**(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))
- with sequence listing part of description (Rule 5.2(a))