

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
10 March 2022 (10.03.2022)



(10) International Publication Number
WO 2022/051448 A1

(51) International Patent Classification:

A61P 35/00 (2006.01) C07K 16/28 (2006.01)
A61K 39/395 (2006.01)

NY 10591 (US). **SANOFI BIOTECHNOLOGY** [FR/FR];
54 Rue La Boetie, 75008 Paris (FR).

(21) International Application Number:

PCT/US2021/048785

(72) **Inventors:** **CHEN, Chieh-I**; C/o Regeneron Pharmaceuticals, Inc., 777 Old Saw Mill River Road, Tarrytown, NY 10591 (US). **SASANE, Medha, R.**; C/o Sanofi, 55 Corporate Drive, Bridgewater, NJ 08807 (US). **BURY-MAYNARD, Denise, P.**; C/o Sanofi, 55 Corporate Drive, Bridgewater, NJ 08807 (US).

(22) International Filing Date:

02 September 2021 (02.09.2021)

(25) Filing Language:

English

(26) Publication Language:

English

(74) **Agent:** **EL HIOUM, Dianna, G.** et al.; Fox Rothschild LLP, 997 Lenox Drive, Lawrenceville, NJ 08648-2311 (US).

(30) Priority Data:

63/074,282 03 September 2020 (03.09.2020) US
63/161,519 16 March 2021 (16.03.2021) US
63/186,375 10 May 2021 (10.05.2021) US
21315132.7 29 July 2021 (29.07.2021) EP

(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,

(71) **Applicants:** **REGENERON PHARMACEUTICALS, INC.** [US/US]; 777 Old Saw Mill River Road, Tarrytown,

(54) **Title:** METHODS OF TREATING CANCER PAIN BY ADMINISTERING A PD-I INHIBITOR

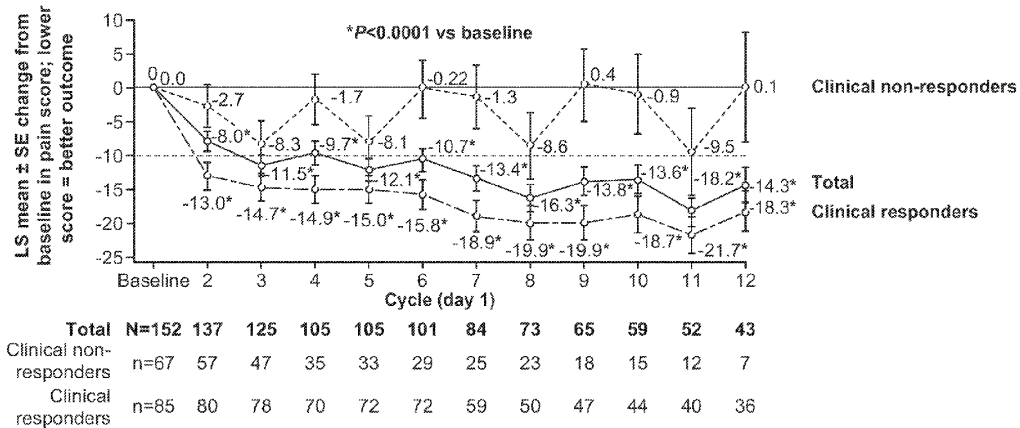


FIG. 1

(57) **Abstract:** The present disclosure provides methods of treating or inhibiting cancer pain in a patient in need thereof, including selecting a patient with cancer, and administering to the patient a therapeutically effective amount of a programmed death 1 (PD-1) inhibitor. The present disclosure also provides methods of reducing analgesic use in a patient in need thereof, including selecting a patient with cancer, and administering to the patient a therapeutically effective amount of a PD-1 inhibitor, wherein the patient is being treated with background analgesic therapy prior to administration of the PD-1 inhibitor. In some embodiments, the disclosed methods concurrently lead to tumor regression, pain reduction, and reduced use of analgesic therapy.

[Continued on next page]

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).

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