

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

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
13 June 2024 (13.06.2024)



(10) International Publication Number
WO 2024/123633 A1

(51) International Patent Classification:

A61K 47/24 (2006.01) *A61K 48/00* (2006.01)
A61K 9/00 (2006.01) *A61P 11/00* (2006.01)
A61K 9/12 (2006.01) *C12N 15/68* (2006.01)
A61K 9/127 (2006.01) *C12N 15/85* (2006.01)
A61K 31/7105 (2006.01) *C12N 15/88* (2006.01)
A61K 38/17 (2006.01)

(21) International Application Number:

PCT/US2023/082205

(22) International Filing Date:

01 December 2023 (01.12.2023)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/431,166 08 December 2022 (08.12.2022) US
63/485,863 17 February 2023 (17.02.2023) US

(71) Applicant: **RECODE THERAPEUTICS, INC.** [US/US];
1140 O'Brien Drive, Menlo Park, California 94025 (US).

(72) Inventors: **CEFALU, Joseph S.**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **HENNIG, Mirko**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **ALFAIFI, Ali Ahmed**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **MOHAPATRA, Sakya Sing**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **ISHIMARU, Daniella**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **KHARITONOV, Vladimir Grigor'evich**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **BAEK, Julia Jung-Un**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **LI, Shuang**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **LOCKHART, David J.**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US). **WUSTMAN, Brandon A.**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US).

(54) Title: LIPID NANOPARTICLE COMPOSITIONS AND USES THEREOF

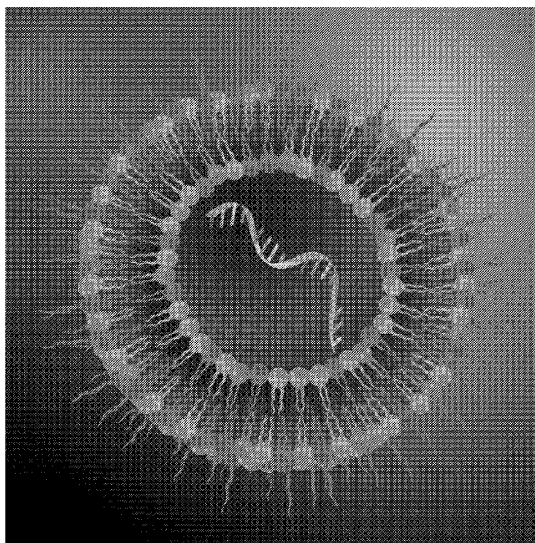


FIG.29

(57) Abstract: Provided are aerosolized pharmaceutical compositions including aerosol particles, the aerosol particles comprising lipid nanoparticles (LNPs). Also provided herein are liquid pharmaceutical compositions for use in making aerosolized pharmaceutical compositions. Also provided herein are methods of administering the aerosolized pharmaceutical compositions. Also provided herein are kits including a lipid nanoparticle composition including one or more of a phospholipid, an ionizable lipid, a PEG-lipid, a sterol.

[Continued on next page]



WO 2024/123633 A1

(US). **WANG, Yufeng**; c/o ReCode Therapeutics, Inc., 1140 O'Brien Drive, Menlo Park, California 94025 (US).

(74) **Agent: WHITTLE, James** et al.; Mintz Levin Cohn Ferris Glovsky and Popeo, PC, One Financial Center, Boston, Massachusetts 02111 (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, CV, CZ, DE, DJ, DK, DM, DO, DZ, EC, EE, EG, ES, FI, GB, GD, GE, GH, GM, GT, HN, HR, HU, ID, IL, IN, IQ, IR, IS, IT, JM, JO, JP, KE, KG, KH, KN, KP, KR, KW, KZ, LA, LC, LK, LR, LS, LU, LY, MA, MD, MG, MK, MN, MU, 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, CV, GH, GM, KE, LR, LS, MW, MZ, NA, RW, SC, 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, ME, 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))