

(19) World Intellectual Property
Organization
International Bureau



(10) International Publication Number

WO 2025/189064 A8

(43) International Publication Date
11 September 2025 (11.09.2025)

WIPO | PCT

(51) International Patent Classification:

A61K 47/54 (2017.01) A61K 47/69 (2017.01)
A61K 47/60 (2017.01) A61P 7/00 (2006.01)

(21) International Application Number:

PCT/US2025/018854

(22) International Filing Date:

07 March 2025 (07.03.2025)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/563,003 08 March 2024 (08.03.2024) US

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(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, UY, 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))

(54) Title: LIPID NANOPARTICLES

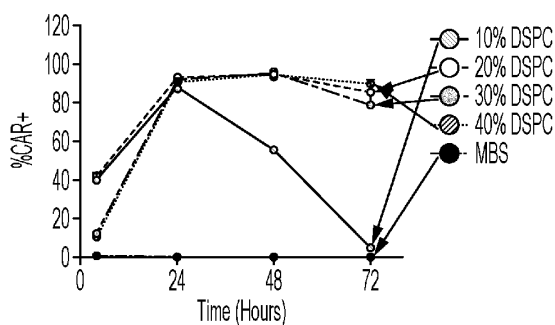


FIG. 1A

(57) Abstract: Provided are lipid nanoparticles, compositions, and methods of making and using the same. The lipid nanoparticles contain ionizable lipids, structural lipids, PEG lipids and specific amounts of helper lipids. The lipid nanoparticles may further contain a cell targeting group coupled to a PEG lipid. The lipid nanoparticles may carry a cargo, e.g., a mRNA. The lipid nanoparticles may be used for transfection of cells, e.g., immune cells or hematopoietic stem cells.

[Continued on next page]

(48) Date of publication of this corrected version:

02 October 2025 (02.10.2025)

(15) Information about Correction:

see Notice of 02 October 2025 (02.10.2025)