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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
15 July 2021 (15.07.2021)

WIPO | PCT

(10) International Publication Number
WO 2021/142355 A1

(51) International Patent Classification:
A61K 47/69 (2017.01) *A61K 31/7105* (2006.01)
A61K 47/50 (2017.01) *B82Y 5/00* (2011.01)

(21) International Application Number:
PCT/US2021/012820

(22) International Filing Date:
08 January 2021 (08.01.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/959,790 10 January 2020 (10.01.2020) US
62/960,626 13 January 2020 (13.01.2020) 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, 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,

(54) Title: NANOPARTICLES FOR EXPRESSION OF GENES OF INTEREST AND/OR REGULATION OF SIGNALING PATHWAYS

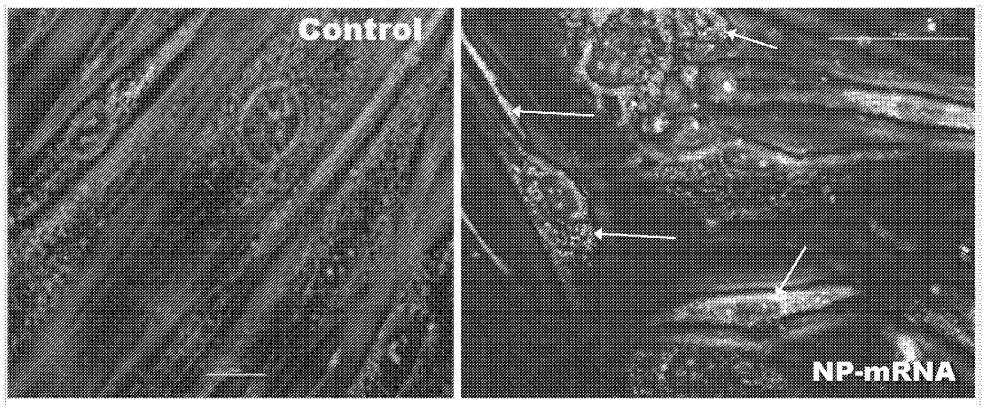


Fig. 2

(57) Abstract: The disclosure provides methods and compositions for delivering RNA constructs to cells for functional expression and/or activity. In some aspects, the disclosure provides a composition comprising a multi-functionalized nanoparticle. The multi-functionalized nanoparticles comprise a core functionalized with at least one RNA molecule, at least one cell penetrating peptide (CPP), and at least one positively charged moiety, each of which is independently attached to the core, optionally with linker moieties. In some embodiments, the RNA molecule is an uncapped mRNA molecule with the 5' end attached to a linker moiety that is attached to the core. The multi-functionalized nanoparticle is substantially neutral, negatively or positively charged. The multi-functionalized nanoparticle can be used in methods of delivering and causing the expression of polypeptides of interest in a cell for various purposes, including vaccination, cancer treatment, extension of telomeres, modification of cellular signaling pathways, and the like.

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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).

Published:
— *with international search report (Art. 21(3))*