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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
16 December 2021 (16.12.2021)

WIPO | PCT

(10) International Publication Number
WO 2021/252803 A1

(51) International Patent Classification:
A61K 47/69 (2017.01) *A61P 35/00* (2006.01)

(21) International Application Number:
PCT/US2021/036878

(22) International Filing Date:
10 June 2021 (10.06.2021)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
63/038,075 11 June 2020 (11.06.2020) US
63/151,591 19 February 2021 (19.02.2021) US

(71) Applicant: **GENENTECH, INC.** [US/US]; 1 DNA Way, South San Francisco, California 94080-4990 (US).

(72) Inventors: **BINDER, Whitney**; c/o Genentech, Inc., 1 DNA Way, South San Francisco, California 94080-4990 (US). **BLANCHETTE, Craig D.**; c/o Genentech, Inc., 1 DNA Way, South San Francisco, California 94080 (US). **DARWISH, Martine A.**; c/o Genentech, Inc., 1 DNA Way, South San Francisco, California 94080 (US). **HANNOUSH, Rami**; c/o Genentech, Inc., 1 DNA Way, South San Francisco, California 94080 (US). **GAO, Xinxin**; c/o Genentech, Inc., 1 DNA Way, South San Francisco, California 94080 (US).

(74) Agent: **XIAO, Jian** et al.; Morrison & Foerster LLP, 755 Page Mill Road, Palo Alto, California 94304-1018 (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, 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.

(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))*
— *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))*

WO 2021/252803 A1

(54) Title: NANOLIPOPROTEIN-POLYPEPTIDE CONJUGATES AND COMPOSITIONS, SYSTEMS, AND METHODS USING SAME

(57) Abstract: The present invention generally relates to nanolipoprotein particle conjugates comprising at least one polypeptide and nanolipoprotein particle conjugates comprising at least one short peptide between 20-60 amino acids in length. Also provided are related compositions and systems, and methods of preparing and using same. In particular, nanolipoprotein particle (NLP) conjugates with antigen-binding fragments (Fabs) are provided, where the NLP comprises a bilayer of membrane-forming lipids encircled by scaffold proteins, and the Fabs are conjugated to one or both bilayer surfaces. In some embodiments, the (NLP) conjugates further comprise a short peptide 20-60 amino acids in length. The conjugates, and related compositions and systems, generally show good stability and manufacturability, retain antigen¬ binding activity, and can enhance antigen-binding potency, providing versatile platforms for delivery of Fab and Fab-based therapeutics and diagnostics, as well as providing stable platforms for delivering other therapeutic and/or diagnostic agents.