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

(19) World Intellectual Property Organization
International Bureau

(43) International Publication Date
08 October 2020 (08.10.2020)

WIPO | PCT

(10) International Publication Number
WO 2020/205778 A1

(51) International Patent Classification:
A61K 39/00 (2006.01) *C12N 5/00* (2006.01)
C07K 14/705 (2006.01)

(21) International Application Number:
PCT/US2020/025796

(22) International Filing Date:
30 March 2020 (30.03.2020)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/827,018 30 March 2019 (30.03.2019) US

(71) Applicant: **BIONTECH US INC.** [US/US]; 40 Erie Street, Suite 110, Cambridge, Massachusetts 02139 (US).

(72) Inventors: **ANG, Robert**; 40 Erie Street, Suite 110, Cambridge, Massachusetts 02139 (US). **JUNEJA, Vikram**; 40 Erie Street, Suite 110, Cambridge, Massachusetts 02139 (US). **GAYNOR, Richard**; 40 Erie Street, Suite 110, Cambridge, Massachusetts 02139 (US).

(74) Agent: **GHOSH, Sanjukta**; 650 Page Mill Road, Palo Alto, California 94304 (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, 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,

(54) **Title:** COMPOSITIONS AND METHODS FOR PREPARING T CELL COMPOSITIONS AND USES THEREOF

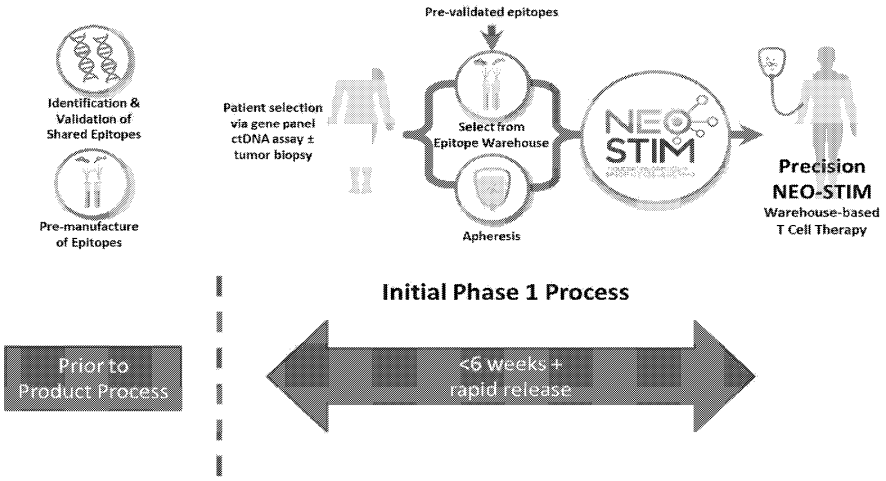


FIG. 1A

(57) **Abstract:** Provided herein are compositions and methods for preparing T cell compositions and uses thereof, including methods for treating cancer in a subject in need thereof by administering T cells induced with peptides comprising an epitope sequence from a library of epitope sequences, wherein each epitope sequence in the library is matched to a protein encoded by an HLA allele and binds to a protein encoded by an HLA allele of the subject, is immunogenic according to an immunogenic assay, is presented by antigen presenting cells according to a mass spectrometry assay, and stimulates T cells to be cytotoxic according to a cytotoxicity assay.

WO 2020/205778 A1

[Continued on next page]

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))*