



(51) International Patent Classification:

C12N 5/0783 (2010.01) A61K 31/70 (2006.01)
C12N 5/078 (2010.01) A61K 31/52 (2006.01)

(21) International Application Number:

PCT/US2022/012029

(22) International Filing Date:

11 January 2022 (11.01.2022)

(25) Filing Language:

English

(26) Publication Language:

English

(30) Priority Data:

63/136,585 12 January 2021 (12.01.2021) US

(71) Applicant: **THE SCRIPPS RESEARCH INSTITUTE**
[US/US]; 10550 North Torrey Pines Road, La Jolla, CA
92037 (US).

(72) Inventors: **WU, Peng**; 3544 Villanova Avenue, San Diego,
CA 92122 (US). **SHI, Yujie**; 9515 Genesee Avenue, San

Diego, CA 92121 (US). **HOU, Yingqin**; 3957 Nobel Drive,
San Diego, CA 92122 (US).

(74) Agent: **FITTING, Thomas** et al.; The Scripps Research In-
stitute, 10550 North Torrey Pines Road, Mail Drop TPC-8,
La Jolla, CA 92037 (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,

(54) Title: SMALL MOLECULES FOR REPROGRAMING ANTI-TUMOR IMMUNITY OF T CELLS

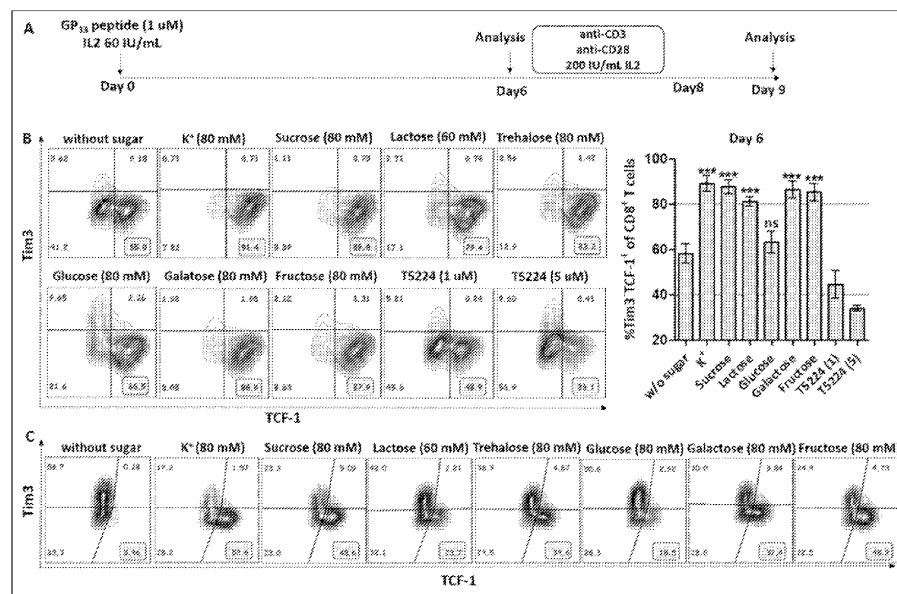


FIG. 1

(57) Abstract: Provided herein are methods for expanding activated T cells to produce T cells with less differentiated status and enhanced in vivo persistence after adoptive transfer. Activated T cells suitable for the methods include, e.g., progenitor exhausted (Tim3-TCF-1⁺), stem memory, and central memory T cells. The invention also provides methods for identifying progenitor exhausted T cells specific to an antigen. Further, the invention provides progenitor exhausted T cells, pharmaceutical compositions, and kits as well as methods for the treatment of cancer or infection using the same.

[Continued on next page]

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))*

(88) Date of publication of the international search report:

25 August 2022 (25.08.2022)