

(19) World Intellectual Property
Organization
International Bureau

(43) International Publication Date
23 July 2020 (23.07.2020)



(10) International Publication Number
WO 2020/150534 A9

(51) International Patent Classification:
A61K 35/12 (2015.01)

(21) International Application Number:
PCT/US2020/013964

(22) International Filing Date:
16 January 2020 (16.01.2020)

(25) Filing Language: English

(26) Publication Language: English

(30) Priority Data:
62/793,277 16 January 2019 (16.01.2019) US
62/839,870 29 April 2019 (29.04.2019) US

(71) Applicant: **BEAM THERAPEUTICS INC.** [US/US]; 26
Landsdowne Street, 2nd Floor, Cambridge, Massachusetts
02139 (US).

(72) Inventors: **GEHRKE, Jason Michael**; 26 Landsdowne
Street, 2nd Floor, Cambridge, Massachusetts 02139 (US).
EDWARDS, Aaron D.; 26 Landsdowne Street, 2nd Floor,

Cambridge, Massachusetts 02139 (US). **MURRAY, Ryan**;
26 Landsdowne Street, 2nd Floor, Cambridge, Massachu-
setts 02139 (US).

(74) Agent: **HUNTER-ENSOR, Melissa**; Greenberg Traurig,
LLP, One International Place, Suite 2000, Boston, MA
02110 (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,

(54) Title: MODIFIED IMMUNE CELLS HAVING ENHANCED ANTI-NEOPLASIA ACTIVITY AND IMMUNOSUPPRESSION
RESISTANCE

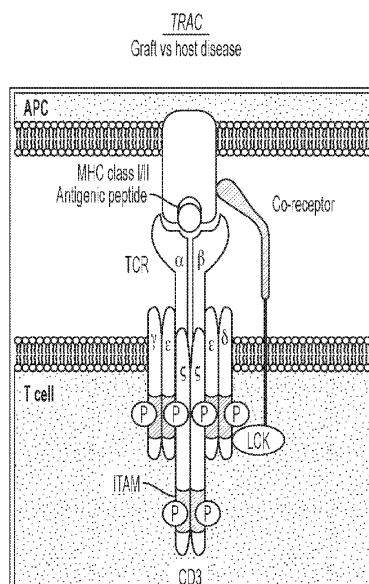


FIG. 1A

(57) Abstract: As described below, the present invention features genetically modified immune cells having enhanced anti-neoplasia activity, resistance to immune suppression, and decreased risk of eliciting a graft versus host reaction, or a combination thereof. The present invention also features methods for producing and using these modified immune effector cells.

[Continued on next page]

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).

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:

- *without international search report and to be republished upon receipt of that report (Rule 48.2(g))*

(48) Date of publication of this corrected version:

13 August 2020 (13.08.2020)

(15) Information about Correction:

see Notice of 13 August 2020 (13.08.2020)