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63/220,842 12 July 2021 (12.07.2021) US(71) Applicant: **NKARTA, INC.** [US/US]; 6000 Shoreline Court, Suite 102, South San Francisco, California 94080 (US).(72) Inventors: **RAJANGAM, Kanya, Lakshmi**; 6000 Shoreline Court, Suite 102, South San Francisco, California 94080 (US). **TRAGER, James, Barnaby**; 6000 Shoreline Court, Suite 102, South San Francisco, California 94080 (US). **GUO BUREN, Luxuan**; 6000 Shoreline Court, Suite 102, South San Francisco, California 94080 (US). **GUO, Chao**; 6000 Shoreline Court, Suite 102, South San Francisco, California 94080 (US). **LAZETIC, Alexandra, Leida, Liana**; 6000 Shoreline Court, Suite 102, South San Francisco, California 94080 (US). **PATEL, Nitinkumar, Lakshmanbhai**; 6000 Shoreline Court, Suite 102, South San Francisco, California 94080 (US).(74) Agent: **LOZAN, Vladimir, S.**; KNOBBE, MARTENS, OLSON & BEAR, LLP, 2040 Main Street, 14th Floor, Irvine, California 92614 (US).

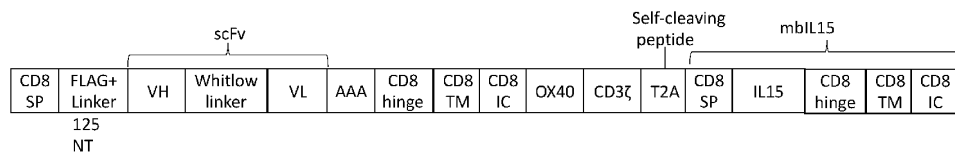
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Declarations under Rule 4.17:

- 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))

(54) Title: BCMA-DIRECTED CELLULAR IMMUNOTHERAPY COMPOSITIONS AND METHODS

Figures 6A

(57) **Abstract:** Provided herein in several embodiments are anti-BCMA binding moieties. These anti-BCMA binding moieties may be used in BCMA-directed chimeric antigen receptors (CARs). Also disclosed herein are immune cell-based compositions comprising the anti-BCMA binding moieties and BCMA-directed CARs. In several embodiments, the immune-cell based compositions also target an additional tumor marker and/or an additional epitope of BCMA. In several embodiments, the BCMA-directed CAR is expressed in a Natural Killer cell. In several embodiments, combinations of BCMA-CAR-expressing NK cells are administered in conjunction with, for example CAR-expressing NK cells and/or CAR-expressing T cells that are directed to an additional cancer marker and/or an additional epitope of BCMA. Also provided for herein are methods and uses of the chimeric antigen receptors in immunotherapy.

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