

CLAIMS

1. A CAR-T cell, which comprises one or more chimeric antigen receptors (CARs) targeting one or more antigens expressed on a malignant T cell, wherein the CAR comprises the amino acid sequence

MALPVTALLLPLALLLHAARPDIQMTQTTSSLSASLGDRVTISCSASQGISNYLNW
YQQKPDGTVKLLIYYTSSLHSGVPSRFSGSGSGTDYSLTISNLEPEDIATYYCQ
QYSKLPYTFGGGKLEIKRGGGGSGGGGSGGGGSGGGGSEVQLVESGGGLVK
PGGSLKLSCAASGLTFSSYAMSWVRQTPEKRLEWVASISSGGFTYYPDSVKGR
FTISRDNARNILYLQMSSLRSEDTAMYYCARDEVRGYLDVWGAGTTVTVSPR
ASTTTPAPRPPTPAPTIASQPLSLRPEACRPAAGGAVHTRGLDFACDFWVLVV
VGGVLACYSLLVTVAFIIFWVKRGRKKLLYIFKQPFMRPVQTTQEEDGCSCRF
PEEEEGGCELRVKFSRSADAPAYKQGQNQLYNELNLGRREEYDVLDKRRGRD
PEMGGKPRRKNPQEGLYNELQKDKMAEAYSEIGMKGERRRGKGGHDGLYQGL
STATKDTYDALHMQALPPR,

wherein the CAR-T cell is deficient in a subunit of the T cell receptor complex and is deficient in CD7.

2. The CAR-T cell as recited in claim 1, wherein the subunit of the T cell receptor complex is chosen from TCR α , TCR β , TCR δ , TCR γ , CD3 ϵ , CD3 γ , CD3 δ , and CD3 ζ .
3. The use of a CAR-T cell as recited in any of claims 1, 2, or 5, for the manufacture of a medicament for the treatment of T-cell acute lymphoblastic leukemia/lymphoma.
4. A chimeric antigen receptor (CAR)-comprising T cell (CAR-T cell) that is deficient in a subunit of the T cell receptor complex and is deficient in CD7, comprising a CAR that specifically binds to CD7 antigen, wherein the CAR comprises:
 - a CD8 α signal peptide comprising SEQ ID NO:1;
 - a light chain variable region comprising SEQ ID NO: 21;
 - a peptide linker comprising SEQ ID NO:9;
 - a heavy chain variable region comprising SEQ ID NO: 20;
 - a CD8 α hinge comprising SEQ ID NO:2;

a CD28 transmembrane domain comprising SEQ ID NO:3;
the costimulatory domain comprising 4-1BB, comprising SEQ ID NO: 5 and not a CD28 costimulatory domain; and
a CD3 zeta signaling domain comprising SEQ ID NO:7.

5. The CAR-T cell as recited in claim 1, wherein the antigen expressed on a malignant T cell is CD7.
6. A therapeutic composition comprising a population of CAR-T cells as recited in any of any of claims 1, 2, or 5 and at least one therapeutically acceptable carrier and/or adjuvant.
7. A therapeutic composition comprising a population of CAR-T cells as recited in claim 4 and at least one therapeutically acceptable carrier and/or adjuvant.
8. The use of a CAR-T cell as recited in claim 4 or the therapeutic composition as recited in claim 7 for the manufacture of a medicament for the treatment of T-cell acute lymphoblastic leukemia/lymphoma.