

WHAT IS CLAIMED IS

1. An isolated polynucleotide encoding a polypeptide comprising an anti-CD19 chimeric antigen receptor (CAR) that is at least 70% identical to SEQ ID NO: 9, wherein the polypeptide does not comprise a rituximab binding site, and wherein the polynucleotide comprises a short EF1a promoter that is capable of expressing the anti-CD19 chimeric antigen receptor (CAR) in a mammalian T cell.
2. The isolated polynucleotide of claim 1, wherein the short EF1a promoter does not comprise an intron comprised by the nucleic acid sequence of SEQ ID NO:15.
3. The isolated polynucleotide of claim 2, wherein the intron comprises the nucleic acid sequence of SEQ ID NO:39.
4. The isolated polynucleotide of any one of the preceding claims, wherein the short EF1a promoter comprises the nucleic acid sequence of SEQ ID NO:16.
5. The isolated polynucleotide of any one of the preceding claims, wherein the polypeptide further comprises a safety switch.
6. The isolated polynucleotide of claim 5, wherein the safety switch is linked to the CD19 CAR using a linker peptide.
7. The isolated polynucleotide of claim 5, wherein the safety switch is linked to the anti-CD19 CAR using a T2A linker.
8. The isolated polynucleotide of any one of claims 5-7, wherein the safety switch comprises an antibody binding site.
9. The isolated polynucleotide of any one of claims 5-7, wherein the safety switch comprises a mutated CD20 mimotope.
10. The isolated polynucleotide of any one of claims 5-9, wherein the polypeptide comprises a CD34 epitope.
11. The isolated polynucleotide of claim 10, wherein the CD34 epitope is a QBEND-10 epitope.
12. The isolated polynucleotide of any one of claims 5-11, wherein the polypeptide further comprises a CD8 hinge/transmembrane domain.

13. The isolated polynucleotide of any one of the preceding claims, comprising a nucleic acid sequence that is at least about 80%, 85%, 90%, 95%, 96%, 98%, 99% or 100% identical to any one of the nucleic acid sequences of SEQ ID NOs: 1-7.

14. The isolated polynucleotide of any one of the preceding claims, wherein the polynucleotide encodes a polypeptide that is at least about 80%, 85%, 90%, 95%, 96%, 98%, 99% or 100% identical to any one of the amino acid sequences of SEQ ID NOs: 8-14.

15. A vector comprising the isolated polynucleotide of any one of the preceding claims.

16. The vector of claim 15, wherein the vector is a retroviral vector, a DNA vector, a plasmid, an RNA vector, an adenoviral vector, an adenovirus associated vector, a lentiviral vector, or any combination thereof.

17. An engineered immune cell comprising the isolated polynucleotide of any one of claims 1-14, wherein the engineered immune cell does not express a rituximab binding site.

18. An engineered immune cell comprising the vector of claim 15 or 16, wherein the engineered immune cell does not express a rituximab binding site.

19. The engineered immune cell of claim 17 or 18, wherein the immune cell is a T cell, tumor infiltrating lymphocyte (TIL), NK cell, TCR-expressing cell, dendritic cell, or NK-T cell.

20. The engineered immune cell of claim 19, wherein the cell is an autologous T cell.

21. The engineered immune cell of claim 19, wherein the cell is an allogeneic T cell.

22. The engineered immune cell of any one of claims 17-21, wherein the cell comprises the polynucleotide that is at least 80%, 85%, 90%, 95%, 96%, 98%, 99% or 100% identical to the nucleic acid sequence of SEQ ID NO: 3.

23. The engineered immune cell of any one of claims 17-22, wherein the cell is resistant to rituximab.

24. A pharmaceutical composition comprising the engineered immune cell of any one of claims 17-23.

25. Use of the engineered immune cell of any one of claims 17-23 in the manufacture of a medicament for treating a disease or disorder in a subject in need thereof.

26. Use of the pharmaceutical composition of claim 24 in the manufacture of a medicament for treating a disease or disorder in a subject in need thereof.

27. The use of claim 25 or 26, wherein the disease or disorder is Non-Hodgkin lymphoma (NHL).

5 **28.** The use of any one of claims 25-27, wherein the subject is one that has been treated or is currently being treated with rituximab.

29. An article of manufacture comprising the engineered immune cell of any one of claims 17-23, or a pharmaceutical composition thereof.