CLAIMS

1. A chimeric antigen receptor comprising:
   i. an antigen binding region, wherein the antigen binding region specifically binds ROR-1 and wherein the antigen binding region comprises a light chain variable domain and a heavy chain variable domain;
      (a) wherein the light chain variable domain comprises a CDR L1 as set forth in SEQ ID NO:43, a CDR L2 as set forth in SEQ ID NO:44 and a CDR L3 as set forth in SEQ ID NO:45; and the heavy chain variable domain comprises a CDR H1 as set forth in SEQ ID NO:46, a CDR H2 as set forth in SEQ ID NO:47, and a CDR H3 as set forth in SEQ ID NO:48; or
      (b) wherein the light chain variable domain comprises a CDR L1 as set forth in SEQ ID NO:49, a CDR L2 as set forth in SEQ ID NO:50 and a CDR L3 as set forth in SEQ ID NO:51; and the heavy chain variable domain comprising a CDR H1 as set forth in SEQ ID NO:52, a CDR H2 as set forth in SEQ ID NO:53, and a CDR H3 as set forth in SEQ ID NO:54;
   ii. a spacer domain, wherein the spacer domain comprises SEQ ID NO:29 or SEQ ID NO:41;
   iii. a transmembrane domain; and
   iv. an intracellular domain.

2. The chimeric antigen receptor of claim 1, wherein the spacer domain is between 14 and 120 amino acids in length.

3. The chimeric antigen receptor of claim 1 or 2, wherein the light chain variable domain is coupled to the N-terminus or the C-terminus of the heavy chain variable domain.

4. The chimeric antigen receptor of claim 3, wherein the light chain variable domain is covalently coupled to the heavy chain variable domain through a polypeptide linker.

5. The chimeric antigen receptor of claim 4, wherein the polypeptide linker comprises an amino acid sequence of SEQ ID NO:24.

6. The chimeric antigen receptor of claim 1, wherein the light chain variable domain comprises an amino acid sequence at least about 90%, 95%, 97%, 98%, 99%, or 100% identical to SEQ ID NO:21.

7. The chimeric antigen receptor of claim 1, wherein the light chain variable domain consists of an amino acid sequence of SEQ ID NO:21.

8. The chimeric antigen receptor of claim 1, wherein the heavy chain variable domain comprises an amino acid sequence at least about 90%, 95%, 97%, 98%, 99%, or 100% identical to SEQ ID NO:27.

9. The chimeric antigen receptor of claim 1, wherein the heavy chain variable domain consists of an amino acid sequence of SEQ ID NO:27.

10. The chimeric antigen receptor of claim 1, wherein the light chain variable domain comprises an amino acid sequence at least about 90%, 95%, 97%, 98%, 99%, or 100% identical to SEQ ID NO:19.

11. The chimeric antigen receptor of claim 1, wherein the light chain variable domain consists of an amino acid sequence of SEQ ID NO:19.

12. The chimeric antigen receptor of claim 1, wherein the light chain variable domain comprises an amino acid sequence at least about 90%, 95%, 97%, 98%, 99%, or 100% identical to SEQ ID NO:20.

13. The chimeric antigen receptor of claim 1, wherein the light chain variable domain consists of an amino acid sequence of SEQ ID NO:20.

14. The chimeric antigen receptor of claim 1, wherein the heavy chain variable domain comprises an amino acid sequence at least about 90%, 95%, 97%, 98%, 99%, or 100% identical to SEQ ID NO:25.

15. The chimeric antigen receptor of claim 1, wherein the heavy chain variable domain consists of an amino acid sequence of SEQ ID NO:25.

16. The chimeric antigen receptor of claim 1, wherein the heavy chain variable domain comprises an amino acid sequence at least about 90%, 95%, 97%, 98%, 99%, or 100% identical to SEQ ID NO:26.

17. The chimeric antigen receptor of claim 1, wherein the heavy chain variable domain consists of an amino acid sequence of SEQ ID NO:26.

18. The chimeric antigen receptor of claim 1, wherein the transmembrane domain comprises a CD8α transmembrane domain, a CD28 transmembrane domain, a CD4 transmembrane domain, a CD3ζ transmembrane domain, or any combination thereof.

19. The chimeric antigen receptor of claim 18, wherein the transmembrane domain is a CD28 transmembrane domain.

20. The chimeric antigen receptor of claim 18, wherein the CD28 transmembrane domain comprises an amino acid sequence of SEQ ID NO:32.

21. The chimeric antigen receptor of claim 18, wherein the CD28 transmembrane domain consists of an amino acid sequence of SEQ ID NO:32.

22. The chimeric antigen receptor of claim 1, wherein the intracellular domain comprises an intracellular co-stimulatory signaling domain, an intracellular T-cell signaling domain, or a combination thereof.

23. The chimeric antigen receptor of claim 22, wherein the intracellular co-stimulatory signaling domain is a 4-1BB intracellular co-stimulatory signaling domain, a CD28 intracellular co-stimulatory signaling domain, a ICOS intracellular co-stimulatory signaling domain, an OX-40 intracellular co-stimulatory signaling domain, or any combination thereof.

24. The chimeric antigen receptor of claim 22, wherein the intracellular costimulatory signaling domain comprises a 4-1BB intracellular co-stimulatory signaling domain.

25. The chimeric antigen receptor of claim 22, the intracellular costimulatory signaling domain comprises a CD28 intracellular co-stimulatory signaling domain and a 4-1BB intracellular co-stimulatory signaling domain.

26. The chimeric antigen receptor of any one of claims 22-25, wherein the intracellular costimulatory signaling domain further comprises an intracellular T-cell signaling domain.

27. The chimeric antigen receptor of claim 26, wherein the intracellular T-cell signaling domain is a CD3ζ intracellular T-cell signaling domain.

28. The chimeric antigen receptor of claim 27, wherein the CD3ζ intracellular T-cell signaling domain comprises an amino acid sequence of SEQ ID NO:34.

29. The chimeric antigen receptor of claim 27, wherein the CD3ζ intracellular T-cell signaling domain consists of an amino acid sequence of SEQ ID NO:34.

30. The chimeric antigen receptor of claim 1, wherein the chimeric antigen receptor binds to a cell expressing ROR-1.

31. A nucleic acid encoding the chimeric antigen receptor of claim 1.

32. The nucleic acid of claim 31, wherein the nucleic acid is a viral vector.

33. The nucleic acid of claim 32, wherein the viral vector is a lentiviral vector.

34. A cell comprising the nucleic acid of claim 31.

35. A cell expressing the chimeric antigen receptor of claim 1.

36. The cell of claim 34 or 35, wherein the cell is a T lymphocyte.

37. The cell of claim 36, wherein the T lymphocyte is a CD4+ T lymphocyte or a CD8 + T lymphocyte.

38. The cell of claim 34 or 35, wherein the cell is a natural killer cell.

39. A pharmaceutical composition comprising a therapeutically effective amount of the cell of claim 34 and a pharmaceutically acceptable diluent, carrier, or excipient, wherein the cell is a T lymphocyte or a natural killer cell.

40. The pharmaceutical composition of claim 39, wherein the composition is formulated for intravenous injection.

41. The pharmaceutical composition of claim 39 for use in a method of treating cancer in an individual, wherein the cancer is a ROR-1 expressing cancer.

42. The pharmaceutical composition for the use of claim 41, wherein the cancer comprises a leukemia, a lymphoma, chronic lymphocytic leukemia, adult acute myeloid leukemia, acute lymphoblastic leukemia, a mantle cell lymphoma, ovarian cancer, colon cancer, lung cancer, skin cancer, pancreatic cancer, testicular cancer, bladder cancer, uterine cancer, prostate cancer, or adrenal cancer.

43. The pharmaceutical composition for the use of claim 41, wherein the cancer is a CD19 negative cancer or has reduced CD19 expression as a result of a prior treatment that targets CD19.

44. The pharmaceutical composition for the use of claim 41, wherein the individual has previously been treated with a therapeutic that targets CD19.

45. The pharmaceutical composition for the use of claim 44, wherein the therapeutic that targets CD19 is an antibody that binds to CD19.

46. The pharmaceutical composition for the use of claim 44, wherein the therapeutic that targets CD19 is a chimeric antigen receptor T cell that targets CD19.

47. The pharmaceutical composition for the use of claim 44, wherein the therapeutic that targets CD19 is a chimeric antigen receptor NK cell that targets CD19.

48. The pharmaceutical composition for the use of any one of claims 41 to 47, wherein the cancer expresses ROR1.