CLAIMS

1. A fusion protein comprising:

(a) a chimeric antigen receptor (CAR) comprising an intracellular signaling domain which comprises an OX40 ligand (OX40L), and an extracellular antigen binding domain that binds to CD5; and

(b) interleukin (IL)-15.

2. The fusion protein of claim 1, wherein the extracellular antigen binding domain is an antigen binding fragment of an anti-CD5 antibody.

3. The fusion protein of claim 2, wherein the antigen-binding fragment is an Fab fragment, an F(ab') fragment, an F(ab')2 fragment or an Fv fragment.

4. The fusion protein of claim 2, wherein the extracellular antigen binding domain comprises a heavy chain variable region comprising HCDR1 having the amino acid sequence of SEQ ID NO: 26, HCDR2 having the amino acid sequence of SEQ ID NO: 28, and HCDR3 having the amino acid sequence of SEQ ID NO: 30.

5. The fusion protein of claim 4, wherein the heavy chain variable region comprises the amino acid sequence of SEQ ID NO: 32.

6. The fusion protein of claim 2, wherein the extracellular antigen binding domain further comprises a light chain variable region comprising LCDR1 having the amino acid sequence of SEQ ID NO: 34, LCDR2 having the amino acid sequence of SEQ ID NO: 36, and LCDR3 having the amino acid sequence of SEQ ID NO: 38.

7. The fusion protein of claim 6, wherein the light chain variable region comprises the amino acid sequence of SEQ ID NO: 40.

8. The fusion protein of claim 2, wherein the extracellular antigen binding domain comprises the amino acid sequence of SEQ ID NO: 7

9. The fusion protein of claim 1, wherein the intracellular signaling domain further comprises at least one domain selected from the group consisting of CD28, CD3-zeta, OX40, and 4-1BB.

10. The fusion protein of claim 9, wherein the intracellular signaling domain further comprises CD28 and CD3-zeta.

11. The fusion protein of claim 10, wherein the intracellular signaling domain comprises CD28, OX40L, and CD3-zeta, which are arranged in order from a cell membrane toward an inside of the cell.

12. The fusion protein of claim 1, wherein the fusion protein further comprises a self-cleaving peptide located between the chimeric antigen receptor and the IL-15.

13. The fusion protein of claim 12, wherein the self-cleaving peptide comprises the amino acid sequence of SEQ ID NO: 21.

14. A nucleic acid molecule encoding the fusion protein of any one of claims 1 to

13.

15. An immune cell expressing the nucleic acid molecule of claim 14.

16. An immune cell expressing:

(a) a chimeric antigen receptor (CAR) comprising an intracellular signaling domain which comprises an OX40 ligand (OX40L), and an extracellular antigen binding domain that binds to CD5; and

(b) interleukin (IL)-15.

17. The immune cell of claim 16, wherein the immune cell is a natural killer cell.

18. Use of a composition in the manufacture of a medicament for preventing or treating a CD5-positive tumor, comprising the immune cell of claim 15 or 16 as an active ingredient.