CLAIMS

What is claimed is:

1. A polypeptide comprising (i) a transmembrane domain from CTLA4 or PD-1, (ii) an intracellular domain of an endogenous protein expressed on the surface of T cells that triggers the activation and/or proliferation of said T cells, and (iii) an extracellular domain that binds to an antigen, wherein

if the transmembrane domain is from CTLA4, the intracellular domain and extracellular domain of said polypeptide are not from CTLA4; and

if the transmembrane domain is from PD-1, the intracellular domain and extracellular domain of said polypeptide are not from PD-1.

2. The polypeptide of claim 1, wherein said polypeptide is a chimeric antigen receptor (CAR).

3. The polypeptide of claim 1 or claim 2, wherein a T cell expressing said polypeptide is activated or stimulated to proliferate when said polypeptide binds to said antigen.

4. The polypeptide of any of claims 1-3, wherein said polypeptide, when expressed on the surface of a T cell, directs the T cell to kill a cell expressing said antigen.

5. The polypeptide of any of claims 1-4, wherein the CTLA4 transmembrane domain is the polypeptide sequence encoded by exon 3 of a human CTLA4 gene.

6. The polypeptide of any of claims 1-4, wherein the CTLA4 transmembrane domain is or comprises the amino acid sequence of SEQ ID NO: 1.

7. The polypeptide of any of claims 1-4, wherein the CTLA4 transmembrane domain is or comprises the amino acid sequence of SEQ ID NO: 2.

8. The polypeptide of any of claims 1-4, wherein the CTLA4 transmembrane domain is or comprises the amino acid sequence of SEQ ID NO: 3.

9. The polypeptide of any of claims 1-4, wherein the CTLA4 transmembrane domain is or comprises the amino acid sequence of SEQ ID NO: 4.

10. The polypeptide of any of claims 1-4, wherein the CTLA4 transmembrane domain is or comprises the amino acid sequence of SEQ ID NO: 5.

11. The polypeptide of any of claims 1-4, wherein the PD-1 transmembrane domain is or comprises the polypeptide sequence of SEQ ID NO: 6.

12. The polypeptide of any of claims 1-4, wherein the PD-1 transmembrane domain is or comprises the polypeptide sequence of SEQ ID NO: 7.