CLAIMS

WHAT IS CLAIMED IS:

1. An immune cell comprising a nucleic acid molecule comprising a first polynucleotide encoding a chimeric antigen receptor (CAR) comprising an antibody that specifically recognizes human mesothelin, and a 4-1BB intracellular region, and a second polynucleotide encoding an interleukin 15 (IL-15), and iii) a third polynucleotide encoding CCL19.

2. An immune cell of claim 1, further comprises a polynucleotide encoding gamma-TCR (γTCR) and a polynucleotide encoding delta-TCR (δTCR), optionally wherein the γTCR is V gamma 9 TCR (Vγ9 TCR) and the δTCR is V delta 2 TCR (Vδ2TCR)

3. An immune cell expressing:

a) a chimeric antigen receptor (CAR) comprising an antibody that specifically recognizes human mesothelin, and a 4-1BB intracellular region; and

b) IL-15; and

c) CCL19.

4. The immune cell of any one of claims 1-3, wherein the CAR further comprises a CD8 hinge region, a CD8 transmembrane region and a CD3ζ intracellular region.

5. The immune cell of any one of claims 1-4, wherein the immune cell is a T cell, a natural killer (NK) cell, a B cell, an antigen presenting cell, or a granulocyte, optionally a T cell or an NK cell or wherein the immune cell is derived from an induced pluripotent stem cell (iPSC).

6. The immune cell of any one of claims 1-5, wherein the immune cell does not express alpha TCR (αTCR) and/or beta TCR (βTCR), optionally αβTCR.

7. The immune cell of any one of claims 1-6, wherein the immune cell expresses a γδTCR, optionally wherein the γδTCR comprises Vγ9 TCR and Vδ2TCR.

8. A pharmaceutical composition comprising the immune cell of any one of claims 1-7, and a pharmaceutically acceptable additive.

9. Use of the immune cell of any one of claims 1-7 or the pharmaceutical composition of claim 8 in the manufacture of a medicament for treating a mesothelin-expressing cancer, wherein said immune cell or pharmaceutical composition is to be administered to a subject in need thereof, optionally wherein the mesothelin-expressing cancer is a solid tumor, optionally selected from mesothelioma, colorectal cancer, pancreatic cancer, thymic cancer, bile duct cancer, lung

cancer, skin cancer, breast cancer, prostate cancer, urinary bladder cancer, virginal cancer, neck cancer, uterine cancer, liver cancer, kidney cancer, spleen cancer, tracheal cancer, bronchial cancer, stomach cancer, esophageal cancer, gallbladder cancer, testis cancer, ovarian cancer, and bone cancer.

10. The use of claim 9, wherein the use further comprises an additional therapeutic agent or an additional therapeutic regimen to be administered to the subject, optionally wherein the additional therapeutic agent comprises a chemotherapeutic agent, an immunotherapeutic agent, a targeted therapy, radiation therapy, or a combination thereof, optionally wherein the additional therapeutic regimen comprises a first-line therapy, optionally wherein the additional therapeutic regimen comprises surgery.

11. An *in vitro* method of decreasing tumor cell proliferation comprising contacting the tumor cell with the immune cell of any one of claims 1-7, thereby decreasing the tumor cell proliferation.

12. A kit comprising the immune cell of any one of claims 1-7, or the pharmaceutical composition of claim 8, and instructions of use.

13. The immune cell of any one of claims 1-7 or the pharmaceutical composition of claim 8 for use in medicine.

14. The immune cell of any one of claims 1-7 or the pharmaceutical composition of claim 8 for use in treating a mesothelin-expressing cancer in a subject.