WHAT IS CLAIMED IS:

1. A composition, comprising NK cells modified to express all or part of a single chain or any combination of CD3ζ, CD3δ, CD3ε, or CD3γ.

2. The composition of claim 1, wherein the NK cells are modified to express one of more of the TCRα chain, the TCRβ chain, the TCRγ chain, and the TCRδ chain.

3. The composition of any one of claims 1 or 2, wherein any one or more of the CD3ζ, CD3ε, CD3δ, and CD3γ are heterologously linked to one or more intracellular signaling domains.

4. The composition of claim 3, wherein the intracellular signaling domain is selected from the group consisting of CD28, DAP10, CD16, NKG2D, DAP12, 2B4, 4-1BB, CD2, and a combination thereof.

5. The composition of any one of claims 3 or 4, wherein the intracellular signaling domain comprises an amino acid sequence at least about 85% identical to SEQ ID NO: 117; or at least about 85% identical to SEQ ID NO: 115; or at least about 85% identical to SEQ ID NO: 116.

6. The composition of any one of claims 1-5, wherein the composition further comprises one or more bispecific or multi-specific antibodies, wherein the bispecific or multi-specific antibody comprises an anti-CD3 antibody.

7. The composition of claim 6, wherein the NK cells express the antibody; and/or wherein the NK cells are complexed with the antibody.

8. The composition of any one of the preceding claims, wherein the NK cells are modified to express one or more heterologous proteins, optionally wherein the heterologous protein is an engineered antigen receptor, a cytokine, a homing receptor, or a chemokine receptor, optionally wherein the engineered antigen receptor is a chimeric antigen receptor and/or engineered T cell receptor, optionally wherein the engineered antigen receptor is an engineered T cell receptor, and wherein the engineered T cell receptor targets a NY-ESO antigen, optionally wherein:

    (a) the T cell receptor comprises a sequence at least 85% identical to SEQ ID NO: 25 and a sequence at least 85% identical to SEQ ID NO: 26; or

(b) the engineered antigen receptor is an engineered T cell receptor, and wherein the engineered T cell receptor targets a PRAME antigen, optionally wherein:

(i) the target PRAME antigen epitope is SLLQHLIGL (SEQ ID NO: 131) and/or QLLALLPSL (SEQ ID NO: 132); and/or

(ii) the T cell receptor comprises: a sequence at least 85% identical to SEQ ID NO: 135 and a sequence at least 85% identical to SEQ ID NO: 136; or a sequence at least 85% identical to SEQ ID NO: 139 and a sequence at least 85% identical to SEQ ID NO: 140; or a sequence at least 85% identical to SEQ ID NO: 143 and a sequence at least 85% identical to SEQ ID NO: 144.

9. The composition of claim 8, wherein:

(a) the heterologous protein is a cytokine; and/or

(b) the cytokine is selected from the group consisting of IL-15, IL-12, IL-2, IL-18, IL-21, IL-23, IL-7, GMCSF, or a combination thereof, optionally wherein the cytokine is membrane-bound, optionally wherein the membrane-bound cytokine comprises a transmembrane domain from CD8, CD28, CD27, B7H3, IgG1, IgG4, CD4, DAP10, or DAP12; and/or

(c) the bispecific antibody comprises an antibody that targets a cancer antigen.

10. A composition comprising a complex, comprising:

(1) NK cells modified to express all or part of the CD3 receptor complex and optionally modified to express the T-cell receptor (TCR) αβ chains or the TCR γδ chains; and

(2) a bispecific or multi-specific antibody, wherein the bispecific or multi-specific antibody comprises an anti-CD3 antibody that is bound to CD3 on the NK cells.

11. The composition of claim 10, wherein the NK cells are modified to express TCR αβ chains that are at least 85% identical to SEQ ID NO: 25 and SEQ ID NO: 26, the TCR αβ chains target a NY-ESO antigen, and the bispecific antibody is Blinatumomab; and/or wherein any one or more of CD3ζ, CD3ε, CD3δ, and CD3γ are heterologously

linked to one or more intracellular signaling domains, optionally wherein the intracellular signaling domain:

(a) is selected from the group consisting of CD28, DAP10, CD16, NKG2D, DAP12, 2B4, 4-1BB, CD2, DNAM, and a combination thereof; and/or

(b) comprises an amino acid sequence at least about 85% identical to SEQ ID NO: 117; or at least about 85% identical to SEQ ID NO: 115; or at least about 85% identical to SEQ ID NO: 116.

12. Use of the composition of any one of claims 1-11 in the manufacture of a medicament for treating cancer in an individual.

13. Use of the composition of claim 10 or 11 in the manufacture of a medicament for redirecting the specificity of NK cells against a cancer antigen for treatment of an individual with a bispecific or multi-specific anti-CD3 antibody, wherein the antibody and NK cells optionally express all or part of a CD3 receptor complex and optionally express part or all of TCR αβ chains or the TCR γδ chains.

14. The use according to claim 13, wherein:

(a) the NK cells are modified to express full length CD3ζ, CD3ε, CD3δ, and/or CD3γ; and/or

(b) any one or more of CD3ζ, CD3ε, CD3δ, and CD3γ are heterologously linked to one or more intracellular signaling domains, optionally wherein:

(i) the intracellular signaling domain is selected from the group consisting of CD28, DAP10, CD16, NKG2D, DAP12, 2B4, 4-1BB, CD2, DNAM, and a combination thereof; and/or

(ii) the intracellular signaling domain comprises an amino acid sequence at least about 85% identical to SEQ ID NO: 117; or at least about 85% identical to SEQ ID NO: 115; or at least about 85% identical to SEQ ID NO: 116; and/or

(c) the use further comprises the step of modifying NK cells to express part or all of the TCR αβ chains or the TCR γδ chains; and/or

(d) the TCR αβ chains or the TCR γδ chains are targeted to an NY-ESO antigen; and/or

(e) the TCR chains are TCR αβ chains, and are at least 85% identical to SEQ ID NO: 25 and SEQ ID NO: 26; and/or

(f) the TCR αβ chains or the TCR γδ chains are targeted to a PRAME antigen, optionally wherein:

(i) the target PRAME antigen epitope is SLLQHLIGL (SEQ ID NO: 131) and/or QLLALLPSL (SEQ ID NO: 132); and/or

(ii) the TCR chains comprise a sequence at least 85% identical to SEQ ID NO: 135 and a sequence at least 85% identical to SEQ ID NO: 136; or at least 85% identical to SEQ ID NO: 139 and a sequence at least 85% identical to SEQ ID NO: 140; or at least 85% identical to SEQ ID NO: 143 and a sequence at least 85% identical to SEQ ID NO: 144; and/or

(g) the use further comprises the step of modifying the NK cells to express one or more additional heterologous proteins.

15. A polynucleotide or polypeptide comprising a sequence at least 85% identical to any one or more of SEQ ID NOs: 118-123.

16. The composition of any one of claims 1-11 for use in therapy.