WHAT IS CLAIMED IS:

1. A composition comprising a peptide that immunospecifically binds to MHC class I polypeptide-related sequence A (MICA), wherein the peptide comprises complementarity determining region (CDR) 3 of the V_H of antibody ID 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, and CDR3 of the V_L of antibody ID 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions.

2. The composition of claim 1, wherein the peptide comprises complementarity determining region (CDR) 3 of the V_H of antibody ID 11 shown in Table 1, and CDR3 of the V_L of antibody ID 11shown in Table 1.

3. The compositions of any one of claims 1-2, wherein the peptide comprises CDR2 of the V_H of antibody ID 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or CDR2 of the V_L of antibody ID 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or both.

4. The composition of claim 3, wherein the peptide comprises complementarity determining region CDR2 of the V_H of antibody ID 11 shown in Table 1, or CDR2 of the V_L of antibody ID 11 shown in Table 1, or both.

5. The compositions of any one of claims 1-4, wherein the peptide comprises CDR1 of the V_H of antibody ID 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or CDR1 of the V_L of antibody ID 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or both.

6. The composition of claim 5, wherein the peptide comprises complementarity determining region CDR1 of the V_H of antibody ID 11 shown in Table 1, or CDR1 of the V_L of antibody ID 11 shown in Table 1, or both.

7. The composition of any one of claims 1-6, wherein the peptide is an antibody or antibody fragment comprising:

a V_H chain with identity to SEQ ID NO:150, wherein regions corresponding to CDR1, CDR2, and CDR3 comprise CDR1, CDR2, and CDR3 of the V_H of antibody ID 11 shown in table 1 having 5 or fewer conservative amino acid substitutions within the CDR1, CDR2, and CDR3 regions, and regions within SEQ ID NO:150 corresponding to FR1, FR2, FR3, FR4, comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to FR1, FR2, FR3, FR4 of the V_H of antibody ID 11 shown in table 1; and

a V_L chain with identity to SEQ ID NO:152 wherein regions corresponding to CDR1, CDR2, and CDR3 comprise CDR1, CDR2, and CDR3 of the V_L of antibody ID 11 shown in table 1 having 5 or fewer conservative amino acid substitutions within the CDR1, CDR2, and CDR3 regions, and regions within SEQ ID NO:152 corresponding to FR1, FR2, FR3, FR4, comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to FR1, FR2, FR3, FR4 of the V_L of antibody ID 11 shown in table 1.

8. The composition of claim 7, wherein the peptide is an antibody or antibody fragment comprising a V_H chain comprising SEQ ID NO:150 and a V_L chain comprising SEQ ID NO:152.

9. The composition of any one of claims 1-8 further comprising an anti-cancer therapeutic.

10. The composition of any one of claims 1-9, formulated as a pharmaceutical composition.

11. A method of treating cancer in a subject, the method comprising administering to a subject a composition of any one of claims 1-10.

12. The composition of any one of claims 1-8 further comprising an histone deacetylase inhibitor (HDAC) selected from the group consisting of hydroxamic acid, vorinostat, suberoylanilide hydroxamic acid (SAHA, trichostatin A (TSA), LAQ824, panobinostat (LBH589), belinostat (PXD101), ITF2357 italfarmaco SpA, cyclic

tetrapeptide, depsipeptide (romidepsin, FK228), benzamide; entinostat (SNDX-275/MS-275), MGCD0103, short-chain aliphatic acids, valproic acid, phenyl butyrate, AN-9, pivanex, CHR-3996, and CHR-2845.

13. The composition of any one of claims 1-8 further comprising a proteasome inhibitor selected from the group consisting of bortezomib, NPI-0052, carfilzomib (PR-171), CEP 18770, and MLN9708.

14. The composition of any one of claims 1-8 further comprising one or more additional agents selected from the group consisting of anti-CTLA-4 antibody or peptide, an anti-PD-1 antibody or peptide, an anti-PDL-1 antibody or peptide, an anti-OX40 antibody or peptide, an anti-GITR antibody or peptide, an anti-LAG-3 antibody or peptide, and an anti-TIM-3 antibody or peptide

15. The composition of any one of claims 1-8 further comprising one or more additional agents used for the treatment of cancer selected from the group consisting of chemotherapy, radiation therapy, cytokines, chemokines and other biologic signaling molecules, tumor specific vaccines, cellular cancer vaccines (e.g., GM-CSF transduced cancer cells), tumor specific monoclonal antibodies, autologous and allogeneic stem cell rescue (e.g., to augment graft versus tumor effects), molecular targeted therapies, anti-angiogenic therapy, and gene therapy.

16. A composition comprising a nucleic acid encoding a peptide that immunospecifically bind to MHC class I polypeptide-related sequence A (MICA), or an epitope thereon, wherein the peptide is an antibody or antibody fragment comprising:

a V_H chain with identity to SEQ ID NO: 2, 77, 96, 113, 131 or 150 wherein regions corresponding to CDR1, CDR2, and CDR3 comprise CDR1, CDR2, and CDR3 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11 shown in table 1 having 5 or fewer conservative amino acid substitutions within the CDR1, CDR2, and CDR3 regions, and regions within SEQ ID NO:2, 77, 96, 113, 131 or 150 corresponding to FR1, FR2, FR3, FR4, comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%,

97%, 98, 99%, or 100% identity to FR1, FR2, FR3, FR4 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11shown in table 1; and

a V_L chain with identity to SEQ ID NO:11, 79, 98, 115, 133, 152 or 170 wherein regions corresponding to CDR1, CDR2, and CDR3 comprise CDR1, CDR2, and CDR3 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in table 1 having 5 or fewer conservative amino acid substitutions within the CDR1, CDR2, and CDR3 regions, and regions within SEQ ID NO:11 79, 98, 115, 133 or 152corresponding to FR1, FR2, FR3, FR4, comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to FR1, FR2, FR3, FR4 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in table 1.

17. A composition comprising a nucleic acid encoding a peptide that immunospecifically bind to MHC class I polypeptide-related sequence A (MICA), or an epitope thereon, wherein the nucleic acid comprises nucleotide sequence having at least about 75%, 80%, 90%, 95%, 99% or more, or complete (100%) sequence identity to SEQ ID NO: 149 .

18. A composition comprising a nucleic acid encoding a peptide that immunospecifically bind to MHC class I polypeptide-related sequence A (MICA), or an epitope thereon, wherein the nucleic acid comprises nucleotide sequence having at least about 75%, 80%, 90%, 95%, 99% or more, or complete (100%) sequence identity to SEQ ID NO: 151.

19. An isolated nucleic acid comprising the nucleotide sequence having at least about 75%, 80%, 90%, 95%, 99% or more, or complete (100%) sequence identity to SEQ ID NO: 149.

20. An isolated nucleic acid comprising the nucleotide sequence having at least about 75%, 80%, 90%, 95%, 99% or more, or complete (100%) sequence identity to SEQ ID NO: 151.

21. An isolated nucleic acid comprising a nucleotide sequence that encodes a peptide having an amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity SEQ ID NO:150.

22. An isolated nucleic acid comprising a nucleotide sequence that encodes a peptide having an amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity SEQ ID NO: 152.

23. A chimeric antigen receptor (CAR) comprising a peptide that immunospecifically binds to MHC class I polypeptide-related sequence A (MICA), wherein the peptide comprises complementarity determining region CDR3 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, and CDR3 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions.

24. The chimeric antigen receptor (CAR) of claim 23, wherein the peptide comprises CDR3 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11shown in Table 1, and CDR3 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1.

25. The chimeric antigen receptor (CAR) of any one of claims 23-24, wherein the peptide comprises CDR2 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11or shown in Table 1 having 5 or fewer conservative amino acid substitutions, or CDR2 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or both.

26. The chimeric antigen receptor (CAR) of claim 25, wherein the peptide comprises CDR2 of the V_H of antibody ID 1, 6, 7, 8, 9or 11 shown in Table 1, or CDR2 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1, or both.

27. The chimeric antigen receptor (CAR) of any one of claims 23-26, wherein the peptide comprises CDR1 of the V_H of antibody ID 1, 6, 7, 8, 9, or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or CDR1 of the V_L

of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or both.

28. The chimeric antigen receptor (CAR) of claim 27, wherein the peptide comprises CDR1 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1, or CDR1 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1, or both.

29. The chimeric antigen receptor (CAR) of any one of claims 23-27, wherein the peptide is an antibody or antibody fragment comprising:

a V_H chain with identity to SEQ ID NO:2, 77, 96, 113, 131 or 150 wherein regions corresponding to CDR1, CDR2, and CDR3 comprise CDR1, CDR2, and CDR3 of the V_H of antibody ID-1, 6, 7, 8 or 9 shown in table 1 having 5 or fewer conservative amino acid substitutions within the CDR1, CDR2, and CDR3 regions, and regions within SEQ ID NO:2, 149, 168, 186, or 204 corresponding to FR1, FR2, FR3, FR4, comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to FR1, FR2, FR3, FR4 of the V_H of antibody ID-1, 6, 7, 8 or 9 shown in table 1; and

a V_L chain with identity to SEQ ID NO:11, 79, 98, 115, 133, or 152 wherein regions corresponding to CDR1, CDR2, and CDR3 comprise CDR1, CDR2, and CDR3 of the V_L of antibody 1 shown in table 1 having 5 or fewer conservative amino acid substitutions within the CDR1, CDR2, and CDR3 regions, and regions within SEQ ID NO:11 151, 170, 189, or 206 corresponding to FR1, FR2, FR3, FR4, comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to FR1, FR2, FR3, FR4 of the V_L of antibody 1 shown in table 1.

30. The chimeric antigen receptor (CAR) of claim 29, wherein the peptide is an antibody or antibody fragment comprising a V_H chain comprising SEQ ID NO:2, 77, 96, 113, 131 or 150 and a V_L chain comprising SEQ ID NO:11, 79, 98, 115, 133, or 152.

31. The chimeric antigen receptor (CAR) of claim 23, further comprising an extracellular hinge domain, a T cell receptor transmembrane domain, and an intracellular T cell receptor signaling domain.

32. The chimeric antigen receptor (CAR) of claim 23 wherein the peptide comprises a CD137 (4-IBB) signaling domain and a CD3-ζ chain.

33. A nucleic acid molecule encoding the chimeric antigen receptor (CAR) of any of claims 21-30.

34. A human T cell harboring the nucleic acid molecule of claim 33.

35. A method of treating cancer in a subject, the method comprising administering to a subject T cell of claim 34, wherein the T cell is an autologous T cell modified to express the chimeric antigen receptor (CAR) .

36. A vector encoding a peptide that comprises complementarity determining region CDR3 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, and CDR3 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11shown in Table 1 having 5 or fewer conservative amino acid substitutions.

37. The vector of claim 36, wherein the peptide comprises CDR3 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1, and CDR3 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1.

38. The vector of any one of claims 36-37, wherein the peptide comprises CDR2 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11shown in Table 1 having 5 or fewer conservative amino acid substitutions, or CDR2 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or both.

39. The vector of claim 38, wherein the peptide comprises CDR2 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1, or CDR2 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1, or both.

40. The vector of any one of claims 36-39, wherein the peptide comprises CDR1 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or CDR1 of the V_L of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1 having 5 or fewer conservative amino acid substitutions, or both.

41. The vector of claim 40, wherein the peptide comprises CDR1 of the V_H of antibody ID 1, 6, 7, 8, 9 or 11 shown in Table 1, or CDR1 of the V_L of antibody ID 11, 6, 7, 8, 9 or 11 shown in Table 1, or both.

42. The vector of any one of claims 36-41, wherein the peptide is an antibody or antibody fragment comprising:

a V_H chain with identity to SEQ ID NO:2, 77, 96, 113, 131 or 150 wherein regions corresponding to CDR1, CDR2, and CDR3 comprise CDR1, CDR2, and CDR3 of the V_H of antibody ID-1, 6, 7, 8 or 9 shown in table 1 having 5 or fewer conservative amino acid substitutions within the CDR1, CDR2, and CDR3 regions, and regions within SEQ ID NO:2, 149, 168, 186, or 204 corresponding to FR1, FR2, FR3, FR4, comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to FR1, FR2, FR3, FR4 of the V_H of antibody ID-1, 6, 7, 8 or 9 shown in table 1; and

a V_L chain with identity to SEQ ID NO:11, 79, 98, 115, 133, or 152 wherein regions corresponding to CDR1, CDR2, and CDR3 comprise CDR1, CDR2, and CDR3 of the V_L of antibody 1 shown in table 1 having 5 or fewer conservative amino acid substitutions within the CDR1, CDR2, and CDR3 regions, and regions within SEQ ID NO:11 151, 170, 189, or 206 corresponding to FR1, FR2, FR3, FR4, comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to FR1, FR2, FR3, FR4 of the V_L of antibody 1 shown in table 1.

43. The vector of claim 42, wherein the peptide is an antibody or antibody fragment comprising a V_H chain comprising SEQ ID NO:2, 77, 96, 113, 131 or 150 and a V_L chain comprising SEQ ID NO:11, 79, 98, 115, 133, or 152.

44. The vector of any of claims 36-43 wherein the vector is an adenoviral vector.

45. An antibody or fragment thereof that immunospecifically binds to MHC class I polypeptide-related sequence A (MICA), wherein the antibody or fragment thereof comprises

a heavy chain variable (V_H) comprising V_H CDR1, V_H CDR2, and V_H CDR3 as shown in the V_H of sequence of SEQ ID NO: 150; and

a light chain variable (V_L) comprising V_L CDR1, V_L CDR2, and V_L CDR3 as shown in the V_L of sequence of SEQ ID NO: 152.

46. The antibody or fragment of claim 45, wherein the V_H region comprises

a V_H CDR1 comprising SEQ ID NO: 154;

a V_H CDR2 comprising SEQ ID NO: 156; and

a V_H CDR3 comprising SEQ ID NO: 158;

or a variant thereof having 5 or fewer conservative amino acid substitutions in VH CDR1 , CDR2, and/or CDR3; and

47 The antibody or fragment of claim 46, wherein the V_l region comprises

a V_L CDR1 comprising SEQ ID NO: 161,

a V_L CDR2 comprising SEQ ID NO: 163, and

a V_L CDR3 comprising SEQ ID NO: 165,

or a variant thereof having 5 or fewer conservative amino acid substitutions in V_L CDR1 , CDR2, and/or CDR3.

48. The antibody or fragment of claim 47, wherein the V_H region comprises the amino acid sequence shown in SEQ ID NO: 150 or a variant thereof with 5 or fewer conservative amino acid substitutions in residues that are not within a CDR and the V_L region comprises the amino acid sequence shown in SEQ ID NO: 152 or a variant thereof with 5 or fewer conservative amino acid substitutions in residues that are not within a CDR.

49. The antibody or fragment of claim 48, wherein the antibody comprises a V_H as shown in the V_H of sequence of SEQ ID NO: 150; and a light chain variable (V_L) as shown in the V_L of sequence of SEQ ID NO: 152.

50. The antibody or fragment of any one of claims 45 to 49, wherein the antibody is human, humanized or chimeric.

51. An antibody or fragment thereof that immunospecifically binds to MHC class I polypeptide-related sequence A (MICA), wherein the antibody comprises

a heavy chain variable (V_H) CDR1 comprising the amino acid sequence shown in SEQ ID NO: 154,

a V_H CDR2 comprising the amino acid sequence shown in SEQ ID NO: 156, and

a V_H CDR3 comprising the amino acid sequence shown in SEQ ID NO: 158, or a variant thereof having 5 or fewer conservative amino acid substitutions in.

52. The antibody or fragment of claim 51, wherein the antibody comprises

a light chain variable region (V_L) CDR1 comprising the amino acid sequence shown in SEQ ID NO: 161,

a V_L CDR2 comprising the amino acid sequence shown in SEQ ID NO: 163, and

a V_L CDR3 comprising the amino acid sequence shown in SEQ ID NO: 165, or a variant thereof having 5 or fewer conservative amino acid substitutions in V_L CDR1 , CDR2, and/or CDR3.

53. An isolated antibody or fragment thereof comprising a heavy chain variable region (V_H) and a light chain variable region (V_L), wherein the V_H region comprises the amino acid sequence of SEQ ID NO: 150 and the V_L region comprises the amino acid sequence of SEQ ID NO: 152.

54. The vector of any of claims 36-43 wherein the vector is a plasmid or a viral vector.

55. The vector of claim 54, wherein the viral vector is selected from the group consisting of poxvirus, adenovirus, retrovirus, herpesvirus, and adeno-associated virus.

56. The vector of any of claims 36-43 wherein the vector is an expression vector.

Claims

1. An antibody or antigen binding fragment thereof that immunospecifically binds to MHC class I polypeptide-related sequence A (MICA), wherein the antibody comprises

a heavy chain variable region (V_H) CDR1 comprising the amino acid sequence shown in SEQ ID NO: 154,

a V_H CDR2 comprising the amino acid sequence shown in SEQ ID NO: 156, and

a V_H CDR3 comprising the amino acid sequence shown in SEQ ID NO: 158,

or a variant thereof having 5 or fewer conservative amino acid substitutions in V_H CDR1, V_H CDR2 and/or V_H CDR3.

2. The antibody or antigen binding fragment of claim 1, wherein the antibody or antigen binding fragment comprises

a light chain variable region (V_L) CDR1 comprising the amino acid sequence shown in SEQ ID NO: 161,

a V_L CDR2 comprising the amino acid sequence shown in SEQ ID NO: 163, and

a V_L CDR3 comprising the amino acid sequence shown in SEQ ID NO: 165,

or a variant thereof having 5 or fewer conservative amino acid substitutions in V_L CDR1, CDR2, and/or CDR3.

3. The antibody or antigen binding fragment of claims 1 or 2, wherein the V_H region comprises

a V_H CDR1 comprising SEQ ID NO: 154;

a V_H CDR2 comprising SEQ ID NO: 156; and

a V_H CDR3 comprising SEQ ID NO: 158.

4. The antibody or antigen binding fragment of any one of claims 1-3, wherein the V_L region comprises

a V_L CDR1 comprising SEQ ID NO: 161,

a V_L CDR2 comprising SEQ ID NO: 163, and

a V_L CDR3 comprising SEQ ID NO: 165.

5. The antibody or antigen binding fragment of any one of claims 1-4, wherein the FR1, FR2, FR3, FR4 regions of the V_H region comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to the corresponding FR1, FR2, FR3, FR4 regions of the V_H set forth in SEQ ID NO: 150.

6. The antibody or antigen binding fragment of any one of claims 2-5, wherein the FR1, FR2, FR3, FR4 regions of the V_L region comprise amino acid sequences with at least 80%, 85%, 90%, 95%, 96%, 97%, 98, 99%, or 100% identity to the corresponding FR1, FR2, FR3, FR4 of the V_L set forth in SEQ ID NO: 152.

7. The antibody or antigen binding fragment of any one of claims 1-6, wherein the V_H region comprises the amino acid sequence shown in SEQ ID NO: 150, or a variant thereof having 5 or fewer conservative amino acid substitutions in residues that are not within a CDR.

8. The antibody or antigen binding fragment of any one of claims 1-7, comprising a V_L region comprising the amino acid sequence shown in SEQ ID NO: 152, or a variant thereof having 5 or fewer conservative amino acid substitutions in residues that are not within a CDR.

9. The antibody or antigen binding fragment of any one of claims 1-8, comprising a V_H region having the amino acid sequence shown in SEQ ID NO: 150; and a V_L having the amino acid sequence shown in SEQ ID NO: 152.

10. The antibody or antigen binding fragment of any one of claims 1-9, wherein the antibody or antigen binding fragment is human, humanized or chimeric.

11. A pharmaceutical composition comprising the antibody or antigen binding fragment of any one of claims 1-10.

12. The pharmaceutical composition of claim 11, comprising one or more additional agents.

13. The composition of 12, comprising one or more additional agents used for the treatment of cancer selected from the group consisting of chemotherapy, radiation therapy, cytokines, chemokines and other biologic signaling molecules, tumor specific vaccines, cellular cancer vaccines (e.g., GM-CSF transduced cancer cells), tumor specific monoclonal antibodies, autologous and allogeneic stem cell rescue (e.g., to augment graft versus tumor effects), molecular targeted therapies, anti-angiogenic therapy, and gene therapy.

14. The pharmaceutical composition of claim 12, wherein the one or more additional agents comprise: an histone deacetylase inhibitor (HDAC) selected from the group consisting of hydroxamic acid, vorinostat, suberoylanilide hydroxamic acid (SAHA, trichostatin A (TSA), LAQ824, panobinostat (LBH589), belinostat (PXD101), ITF2357 italfarmaco SpA, cyclic tetrapeptide, depsipeptide (romidepsin, FK228), benzamide; entinostat (SNDX-275/MS-275), MGCD0103, short-chain aliphatic acids, valproic acid, phenyl butyrate, AN-9, pivanex, CHR-3996, and CHR-2845; a proteasome inhibitor selected from the group consisting of bortezomib, NPI-0052, carfilzomib (PR-171), CEP 18770, and MLN9708; anti-CTLA-4 antibody or peptide; an anti-PD-1 antibody or peptide; an anti-PDL-1 antibody or peptide; an anti-OX40 antibody or peptide; an anti-GITR antibody or peptide; an anti-LAG-3 antibody or peptide; and an anti-TIM-3 antibody or peptide.

15. The pharmaceutical composition of any one of claims 11-14, for use in the treatment of cancer in a subject.

16. An isolated nucleic acid that encodes the antibody or antigen binding fragment of any one of claims 1-10.

17. The isolated nucleic acid of claim 16, comprising a nucleotide sequence having at least about 75%, 80%, 90%, 95%, 99% or 100% identity to SEQ ID NO: 149.

18. The isolated nucleic acid of claims 16 or 17, comprising a nucleotide sequence having at least about 75%, 80%, 90%, 95%, 99% or 100% sequence identity to SEQ ID NO: 151.

19. A vector comprising the nucleic acid of any one of claims 16-18.

20. The vector of claim 19, wherein the vector is a plasmid or viral vector.