

WHAT IS CLAIMED IS:

1. An isolated antibody that specifically binds the extracellular domain of TIGIT, which comprises:
 - (a) a heavy chain CDR1 comprising TSDYAWN (SEQ ID NO:57), a heavy chain CDR2 comprising YISYSGSTSYNPSLRS (SEQ ID NO:58), and a heavy chain CDR3 comprising ARRQVGLGFAY (SEQ ID NO:59), and a light chain CDR1 comprising KASQDVSTAVA (SEQ ID NO:60), a light chain CDR2 comprising SASYRYT (SEQ ID NO:61), and a light chain CDR3 comprising QQHYSTP (SEQ ID NO:62);
 - (b) a heavy chain CDR1 comprising GSSLSSSYMS (SEQ ID NO:7), a heavy chain CDR2 comprising IIGSNGNTYYANWAKG (SEQ ID NO:8), and a heavy chain CDR3 comprising GGYRTSGMDP (SEQ ID NO:9), and a light chain CDR1 comprising QASQSISSYLNW (SEQ ID NO:10), a light chain CDR2 comprising DALKLAS (SEQ ID NO:11), and a light chain CDR3 comprising QQEHSVGNVDN (SEQ ID NO:12); or
 - (c) a heavy chain CDR1 comprising GFSLSSSYMS (SEQ ID NO:13), a heavy chain CDR2 comprising IIGSNGNTYYANWAKG (SQ ID NO:8), and a heavy chain CDR3 comprising GGYRTSGMDP (SEQ ID NO:9); and a light chain CDR1 comprising QASQNIYSDLAW (SEQ ID NO:81), a light chain CDR2 comprising RASTLAS (SEQ ID NO:15), and a light chain CDR3 comprising QQEHLVAWIYN (SEQ ID NO:16).
2. The antibody of claim 1, which comprises:
 - (a) a heavy chain variable region having at least 95% sequence identity to SEQ ID NO:67 and a light chain variable region having at least 95% sequence identity to SEQ ID NO:68;
 - (b) a heavy chain variable region having at least 95% sequence identity to SEQ ID NO:63 and a light chain variable region having at least 95% sequence identity to SEQ ID NO:64;
 - (c) a heavy chain variable region having at least 90% sequence identity to SEQ ID NO:17 and a light chain variable region having at least 90% sequence identity to SEQ ID NO:18;
 - (d) a heavy chain variable region having at least 90% sequence identity to SEQ ID NO:19 and a light chain variable region having at least 90% sequence identity to SEQ ID NO:20;or
 - (e) a heavy chain variable region having at least 90% sequence identity to SEQ ID NO:32 and a light chain variable region having at least 90% sequence identity to SEQ ID NO:20.
3. The antibody of claim 1 or claim 2, which is a monoclonal antibody, a humanized antibody, a human antibody, a chimeric antibody, a bispecific antibody, an IgG1 antibody, an IgG2 antibody, an IgG4 antibody, or an antibody fragment comprising an antigen binding site.

4. The antibody of claim 1 or claim 2, which comprises:
 - (a) a heavy chain amino acid sequence of SEQ ID NO:70 and a light chain amino acid sequence of SEQ ID NO:72;
 - (b) a heavy chain amino acid sequence of SEQ ID NO:82 and a light chain amino acid sequence of SEQ ID NO:72;
 - (c) a heavy chain amino acid sequence of SEQ ID NO:26 and a light chain amino acid sequence of SEQ ID NO:28;
 - (d) a heavy chain amino acid sequence of SEQ ID NO:27 and a light chain amino acid sequence of SEQ ID NO:28;
 - (e) a heavy chain amino acid sequence of SEQ ID NO:29 and a light chain amino acid sequence of SEQ ID NO:30;
 - (f) a heavy chain amino acid sequence of SEQ ID NO:34 and a light chain amino acid sequence of SEQ ID NO:30; or
 - (g) a heavy chain amino acid sequence of SEQ ID NO:56 and a light chain amino acid sequence of SEQ ID NO:30.
5. An antibody comprising:
 - (a) the heavy chain variable region encoded by the plasmid deposited with ATCC as PTA-122346 and/or the light chain variable region encoded by the plasmid deposited with ATCC as PTA-122347; or
 - (b) the heavy chain variable region encoded by the plasmid deposited with ATCC as PTA-122180 and/or the light chain variable region encoded by the plasmid deposited with ATCC as PTA-122181.
6. The antibody according to any one of claims 1-5, which binds human TIGIT, but does not bind:
 - (a) mouse TIGIT;
 - (b) rat TIGIT;
 - (c) cynomolgus monkey TIGIT; and/or
 - (d) rhesus monkey TIGIT.
7. An isolated antibody that competes with the antibody according to any one of claims 1-6 for specific binding to TIGIT.

8. An isolated antibody that binds the same epitope on TIGIT as the antibody according to any one of claims 1-6.
9. An isolated antibody that binds an epitope on TIGIT that overlaps with the epitope on TIGIT bound by the antibody according to any one of claims 1-6.
10. The antibody according to any one of claims 1-9, which:
 - (a) inhibits binding of TIGIT to poliovirus receptor (PVR);
 - (b) inhibits or blocks the interaction between TIGIT and PVR;
 - (c) inhibits TIGIT signaling;
 - (d) inhibits TIGIT activation;
 - (e) inhibits phosphorylation of TIGIT; and/or
 - (f) decreases cell surface expression of TIGIT.
11. The antibody according to any one of claims 1-10, which induces and/or enhances an immune response.
12. The antibody of claim 11, wherein the immune response is directed to a tumor or tumor cell.
13. The antibody according to any one of claims 1-9, which:
 - (a) increases cell-mediated immunity;
 - (b) increases T-cell activity;
 - (c) increases cytolytic T-cell (CTL) activity;
 - (d) increases natural killer (NK) cell activity;
 - (e) increases IL-2 production and/or the number of IL-2-producing cells;
 - (f) increases IFN-gamma production and/or the number of IFN-gamma-producing cells;
 - (g) increases a Th1-type immune response;
 - (h) decreases IL-4 production and/or the number of IL-4-producing cells;
 - (i) decreases IL-10 and/or the number of IL-10-producing cells;
 - (j) decreases a Th2-type immune response;
 - (k) inhibits and/or decreases the suppressive activity of regulatory T-cells (Tregs); and/or
 - (l) inhibits and/or decreases the suppressive activity of myeloid-derived suppressor cells (MDSCs).

14. An isolated antibody that specifically binds human TIGIT, wherein the antibody binds an epitope comprising:
 - (a) amino acids within SEQ ID NO:79;
 - (b) amino acids within SEQ ID NO:80;
 - (c) amino acids within SEQ ID NO:79 and SEQ ID NO:80;
 - (d) amino acids Q62 and I109 of SEQ ID NO:4;
 - (e) amino acids Q62 and T119 of SEQ ID NO:4;
 - (f) amino acids Q64 and I109 of SEQ ID NO:4;
 - (g) amino acids Q64 and T119 of SEQ ID NO:4;
 - (h) amino acids Q62, Q64, and I109 of SEQ ID NO:4;
 - (i) amino acids Q62, Q64, and T119 of SEQ ID NO:4;
 - (j) amino acids Q62, I109, and T119 of SEQ ID NO:4;
 - (k) amino acids Q64, I109, and T119 of SEQ ID NO:4; or
 - (l) amino acids Q62, Q64, I109, and T119 of SEQ ID NO:4.
15. The antibody of claim 14, wherein the antibody binds an epitope comprising at least one of amino acids N58, E60, Q62, Q64, L65, F107, I109, H111, T117, T119, and G120 of SEQ ID NO:4.
16. A polypeptide comprising a sequence selected from the group consisting of: SEQ ID NO:17, SEQ ID NO:18, SEQ ID NO:19, SEQ ID NO:20, SEQ ID NO:21, SEQ ID NO:22, SEQ ID NO:23, SEQ ID NO:24, SEQ ID NO:25, SEQ ID NO:26, SEQ ID NO:27, SEQ ID NO:28, SEQ ID NO:29, SEQ ID NO:30, SEQ ID NO:32, SEQ ID NO:33, SEQ ID NO:34, SEQ ID NO:55, SEQ ID NO:56, SEQ ID NO:63, SEQ ID NO:64, SEQ ID NO:67, SEQ ID NO:68, SEQ ID NO:69, SEQ ID NO:70, SEQ ID NO:71, SEQ ID NO:72, SEQ ID NO:82, and SEQ ID NO:83.
17. A heterodimeric agent comprising an antibody according to any one of claims 1-9.
18. A bispecific agent comprising:
 - a) a first arm that specifically binds TIGIT, and
 - b) a second arm,wherein the first arm comprises an antibody according to any one of claims 1-9.

19. The bispecific agent of claim 18, wherein the second arm comprises an antigen-binding site from an antibody.
20. A cell comprising or producing the antibody according to any one of claims 1-9, the heterodimeric agent of claim 17, or the bispecific agent of claim 18 or claim 19.
21. A pharmaceutical composition comprising the antibody according to any one of claims 1-9, the heterodimeric agent of claim 17, or the bispecific agent of claim 18 or claim 19 and a pharmaceutically acceptable carrier.
22. An isolated polynucleotide molecule comprising a polynucleotide that encodes the antibody according to any one of claims 1-9, the heterodimeric agent of claim 17, or the bispecific agent of claim 18 or claim 19.
23. An isolated polynucleotide comprising a polynucleotide sequence selected from the group consisting of: SEQ ID NO:65, SEQ ID NO:66, SEQ ID NO:73, SEQ ID NO:74, SEQ ID NO:75, SEQ ID NO:76, and SEQ ID NO:84.
24. A vector comprising the polynucleotide of claim 22 or claim 23.
25. The antibody according to any one of claims 1-9, the heterodimeric agent of claim 17, or the bispecific agent of claim 18 or claim 19 for use in inducing, activating, promoting, increasing, enhancing, or prolonging an immune response in a subject, wherein a therapeutically effective amount of the antibody, the heterodimeric agent, or the bispecific agent is to be administered to the subject.
26. The antibody, the heterodimeric agent, or the bispecific agent for use according to claim 25, wherein the immune response is against a tumor or cancer.
27. Use of the antibody according to any one of claims 1-9, the heterodimeric agent of claim 17, or the bispecific agent of claim 18 or claim 19 in the manufacture of a medicament to inhibit growth of a tumor in a subject, wherein a therapeutically effective amount of the antibody, the heterodimeric agent, or the bispecific agent is to be administered to the subject.

28. The use of claim 27, wherein the tumor or tumor cell is selected from the group consisting of colorectal tumor, ovarian tumor, pancreatic tumor, lung tumor, liver tumor, breast tumor, kidney tumor, prostate tumor, gastrointestinal tumor, melanoma, cervical tumor, bladder tumor, glioblastoma, and head and neck tumor.
29. Use of the antibody according to any one of claims 1-9, the heterodimeric agent of claim 17, or the bispecific agent of claim 18 or claim 19 in the manufacture of a medicament to treat cancer in a subject, wherein a therapeutically effective amount of the antibody, the heterodimeric agent, or the bispecific agent is to be administered to the subject.
30. The use of claim 29, wherein the cancer is selected from the group consisting of colorectal cancer, ovarian cancer, pancreatic cancer, lung cancer, liver cancer, breast cancer, kidney cancer, prostate cancer, gastrointestinal cancer, melanoma, cervical cancer, bladder cancer, glioblastoma, and head and neck cancer.
31. The antibody, the heterodimeric agent, or the bispecific agent for use according to claim 25 or 26, or the use according to any one of claims 27-30, wherein at least one additional therapeutic agent is to be further administered.
32. A plasmid deposited with ATCC and selected from the group consisting of assigned designation numbers PTA-122180, PTA-122181, PTA-122346, and PTA-122347.