

CLAIMS:

1. An isolated antibody that specifically binds to human TIGIT, the antibody comprising:
 - (a) a VH comprising the CDRH1, CDRH2, and CDRH3 amino acid sequences of the VH amino acid sequence of SEQ ID NO: 7; and
 - (b) a VL comprising the CDRL1, CDRL2, and CDRL3 amino acid sequences of the VL amino acid sequence of SEQ ID NO: 9,
wherein the VH comprises lysine at amino acid position 12, serine at amino acid position 16, lysine at amino acid position 73, serine at amino acid position 76, alanine at amino acid position 78, and/or arginine at amino acid positions 83, respectively, and
wherein the VL comprises lysine at amino acid position 45, glycine at amino acid position 57, valine at amino acid position 58, and/or alanine at amino acid positions 80,
in each case numbered according to Kabat.
2. The isolated antibody of claim 1, wherein:
 - (a) the VH comprises lysine, serine, lysine, serine, alanine, and arginine at amino acid positions 12, 16, 73, 76, 78, and 83, respectively, and the VL comprises lysine, glycine, valine, and alanine at amino acid positions 45, 57, 58, and 80, respectively;
 - (b) the VH comprises lysine, serine, and arginine at amino acid positions 12, 16, and 83, respectively, and the VL comprises lysine and alanine at amino acid positions 45 and 80, respectively;
 - (c) the VH comprises lysine, serine, lysine, serine, alanine, and arginine at amino acid positions 12, 16, 73, 76, 78, and 83, respectively, and the VL comprises lysine and alanine at amino acid positions 45 and 80, respectively; or
 - (d) the VH comprises lysine, serine, and arginine at amino acid positions 12, 16, and 83, respectively, and the VL comprises lysine, glycine, valine, and alanine at amino acid positions 45, 57, 58, and 80, respectively,
numbered according to Kabat.

3. The isolated antibody of claim 1 or 2, wherein the antibody comprises the CDRH1, CDRH2, CDRH3, CDRL1, CDRL2, and CDRL3 amino acid sequences of SEQ ID NOs: 1, 2, 3, 4, 5, and 6, respectively.
4. The isolated antibody of any one of claims 1-3, wherein the antibody comprises the VH amino acid sequence of SEQ ID NO: 7 or 8, and/or the VL amino acid sequence of SEQ ID NO: 9 or 10.
5. An isolated antibody that specifically binds to human TIGIT, the antibody comprising a VH comprising the amino acid sequence of SEQ ID NO: 7 or 8, and a VL comprising the amino acid sequence of SEQ ID NO: 9 or 10.
6. The isolated antibody of claim 5, wherein the antibody comprises the VH and VL amino acid sequences of SEQ ID NOs: 7 and 9; 7 and 10; 8 and 9; or 8 and 10, respectively.
7. The isolated antibody of any one of the preceding claims, wherein:
 - (a) the antibody comprises a heavy chain constant region, wherein the heavy chain constant region:
 - (i) is selected from the group consisting of human IgG₁, IgG₂, IgG₃, IgG₄, IgA₁, and IgA₂;
 - (ii) is an IgG₁ heavy chain constant region;
 - (iii) comprises the amino acid sequence of SEQ ID NO: 16;
 - (iv) is an IgG₁ heavy chain constant region comprising an N297A mutation, numbered according to the EU numbering system;
 - (v) is a variant of a wild type heavy chain constant region, wherein the variant heavy chain constant region binds to an FcγR with higher affinity than the wild type heavy chain constant region binds to the FcγR, optionally wherein the FcγR is FcγRIIB or FcγRIIIA;
 - (vi) is an IgG₁ heavy chain constant region comprising S267E and L328F mutations, numbered according to the EU numbering system;

- (v) is an IgG₁ heavy chain constant region comprising at least one mutation selected from the group consisting of S239D, A330L, and I332E mutations, numbered according to the EU numbering system; and/or
- (vi) is an IgG₁ heavy chain constant region comprising S239D, A330L, and I332E mutations, numbered according to the EU numbering system; and/or
- (b) the antibody comprises a light chain constant region comprising the amino acid sequence of SEQ ID NO: 17 or 18.
8. The isolated antibody of any one of the preceding claims, wherein the antibody comprises a heavy chain comprising the amino acid sequence of SEQ ID NO: 11, 12, 19, or 20, and/or a light chain comprising the amino acid sequence of SEQ ID NO: 13, 14, 15, or 21.
9. An isolated antibody that specifically binds to human TIGIT, wherein the antibody comprises a heavy chain comprising the amino acid sequence of SEQ ID NO: 11, 12, 19, or 20, and a light chain comprising the amino acid sequence of SEQ ID NO: 13, 14, 15, or 21.
10. The isolated antibody of claim 9, wherein the heavy chain and light chain comprise the amino acid sequences of SEQ ID NOs: 11 and 13; 11 and 14; 11 and 15; 11 and 21; 12 and 13; 12 and 14; 12 and 15; 12 and 21; 19 and 13; 19 and 14; 19 and 15; 19 and 21; 20 and 13; 20 and 14; 20 and 15; or 20 and 21, respectively.
11. The isolated antibody of any one of the preceding claims, wherein the antibody is multispecific.
12. The isolated antibody of any one of the preceding claims, wherein the isolated antibody is conjugated to a cytotoxic agent, cytostatic agent, toxin, radionuclide, or detectable label.
13. The isolated antibody of any one of the preceding claims, wherein the isolated antibody is conjugated to an antibody.

14. An isolated polynucleotide encoding the VH and/or the VL, or a heavy chain and/or a light chain, of the isolated antibody of any one of the preceding claims.
15. A vector comprising the polynucleotide of claim 14.
16. A recombinant host cell comprising:
- (a) the polynucleotide of claim 14;
 - (b) the vector of claim 15;
 - (c) a polynucleotide encoding the VH and the VL, or a heavy chain and a light chain, of the isolated antibody of any one of claims 1-13;
 - (d) a vector comprising a polynucleotide encoding the VH and the VL, or a heavy chain and a light chain, of the isolated antibody of any one of claims 1-13;
 - (e) a first polynucleotide encoding the VH or a heavy chain of the isolated antibody of any one of claims 1-13, and a second polynucleotide encoding the VL or a light chain of the isolated antibody of any one of claims 1-13; or
 - (f) a first vector comprising a first polynucleotide encoding the VH or a heavy chain of the isolated antibody of any one of claims 1-13, and a second vector comprising a second polynucleotide encoding the VL or a light chain of the isolated antibody of any one of claims 1-13.
17. A pharmaceutical composition comprising the isolated antibody of any one of claims 1-13, the polynucleotide of claim 14, the vector of claim 15, or the host cell of claim 16 and a pharmaceutically acceptable carrier or excipient.
18. A method of producing an isolated antibody, the method comprising culturing the host cell of claim 16 under suitable conditions so that the polynucleotide is expressed and the isolated antibody is produced.
19. A method of producing an isolated antibody, the method comprising expressing in a cell:
- (a) a first polynucleotide encoding the VH of the antibody of any one of claims 1-13 and a second polynucleotide encoding the VL of the antibody of any one of claims 1-13; or

(b) a first polynucleotide encoding a heavy chain of the antibody of any one of claims 1-13 and a second polynucleotide encoding a light chain of the antibody of any one of claims 1-13, under suitable conditions so that the polynucleotides are expressed and the antibody is produced.

20. The isolated antibody of any one of claims 1-13, the polynucleotide of claim 14, the vector of claim 15, the host cell of claim 16, or the pharmaceutical composition of claim 17 for use in medicine.

21. Use of the isolated antibody of any one of claims 1-13, the polynucleotide of claim 14, the vector of claim 15, the host cell of claim 16, or the pharmaceutical composition of claim 17 in the manufacture of a medicament for:

- (a) enhancing an immune response in a subject;
- (b) treating cancer in a subject; or
- (c) treating an infectious disease in a subject.

22. The isolated antibody of any one of claims 1-13, the polynucleotide of claim 14, the vector of claim 15, the host cell of claim 16, or the pharmaceutical composition of claim 17 for use in the treatment of cancer in a subject.

23. The use of claim 21, wherein the medicament is formulated to be administered systemically, intravenously, subcutaneously, intratumorally, or to a tumor draining lymph node.