CLAIMS

1. An antibody or an antigen-binding fragment thereof, which is capable of binding to human Tigit, comprising:

(a) a heavy chain variable region (VH) comprising one, two or three CDR amino acid sequences selected from SEQ ID NOs 3, 4, 5 or 13; and / or

(b) a light chain variable region (VL) comprising one, two or three CDR amino acid sequences selected from SEQ ID NOs: 6, 7 or 8.

2. The antibody or the antigen-binding fragment of Claim 1, comprising:

(a) a heavy chain variable region (VH) comprising a VH-CDR1 amino acid sequence of SEQ ID NO 3, a VH-CDR2 amino acid sequence of SEQ ID NO 4 and a VH-CDR3 amino acid sequence of SEQ ID NO 5; and a light chain variable region (VL) comprising a VL-CDR1 amino acid sequence of SEQ ID NO 6, a VL-CDR2 amino acid sequence of SEQ ID NO 7 and a VL-CDR3 amino acid sequence of SEQ ID NO 8; or

(b) a heavy chain variable region (VH) comprising a VH-CDR1 amino acid sequence of SEQ ID NO 3, a VH-CDR2 amino acid sequence of SEQ ID NO 13 and a VH-CDR3 amino acid sequence of SEQ ID NO 5; and a light chain variable region (VL) comprising a VL-CDR1 amino acid sequence of SEQ ID NO 6, a VL-CDR2 amino acid sequence of SEQ ID NO 7 and a VL-CDR3 amino acid sequence of SEQ ID NO 8.

3. The antibody or the antigen-binding fragment of Claim 1, wherein the antibody is a humanized antibody molecule.

4. The antibody or the antigen-binding fragment of Claim 1, comprising a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NOs 9, 14, or 19.

5. The antibody or the antigen-binding fragment of Claim 1, comprising a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 11, 16 or 21.

6. The antibody or the antigen-binding fragment of Claim 1, comprising:

(a) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 9, and a light chain variable domain having at

least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 11;

(b) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 9, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 16;

(c) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 9, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 21;

(d) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 14, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 11;

(e) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 14, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 16;

(f) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 14, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 21;

(g) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 19, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 11;

(h) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 19, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 16; or

(i) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 19, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 21.

7. The antibody or the antigen-binding fragment of Claim 1, comprising:

(a) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 9, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 11;

(b) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 14, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 16; or

(c) a heavy chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 19, and a light chain variable domain having at least 95%, 96%, 97%, 98%, 99% or 100% sequence identity with the amino acid sequence of SEQ ID NO 21.

8. The antibody or the antigen-binding fragment of Claim 1, comprising:

(a) a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO 9, and a light chain variable domain comprising the amino acid sequence of SEQ ID NO 11;

(b) a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO 14, and a light chain variable domain comprising the amino acid sequence of SEQ ID NO 16; or

(c) a heavy chain variable domain comprising the amino acid sequence of SEQ ID NO 19, and a light chain variable domain comprising the amino acid sequence of SEQ ID NO 21.

9. The antibody or the antigen-binding fragment of any one of Claims 1-8, wherein the antibody comprises one or more of:

(a) a heavy chain with a T to A mutation at position 24 of SEQ ID NO 14;

(b) a heavy chain with a I to V mutation at position 37 of SEQ ID NO 14;

(c) a light chain with a V to I mutation at position 58 of SEQ ID NO 16.

10. The antibody or the antigen-binding fragment of Claim 1, wherein the antigen-binding fragment is a Fab, F(ab')2, Fv, or a single chain Fv (ScFv).

11. The antibody or the antigen-binding fragment of Claim 1, comprising a heavy chain constant region of the subclass of IgG1, IgG2, IgG3, or IgG4 or a variant thereof, and a light chain constant region of the type of kappa or lambda or a variant thereof.

12. A pharmaceutical composition, comprising the antibody or the antigen-binding fragment of any one of Claims 1-11, and a pharmaceutically acceptable excipient.

13. The composition of claim 12, further comprising second therapeutic agent.

14. A method of stimulating an immune response in a subject, comprising administrating to a subject in need thereof the antibody or antigen-binding fragment of any one of claims 1-11 in an amount effective to stimulate the immune respond.

15. A method for treating a cancer or a tumor, comprising administrating to a subject in need thereof the antibody or the antigen-binding fragment of any one of Claims 1-11 in an amount effective to treat the cancer or tumor.

16. The method of Claim 15, wherein the antibody or the antigen-binding fragment is administrated in combination with a second therapeutic agent or procedure, wherein the second therapeutic agent or procedure is selected from a chemotherapy, a targeted therapy, an oncolytic drug, a cytotoxic agent, an immune-based therapy, a cytokine, a surgical procedure, a radiation procedure, an activator of a costimulatory molecule, an inhibitor of an inhibitory molecule, a vaccine, or a cellular immunotherapy.

17. A method of treating an infectious disease, comprising administering to a subject in need thereof an antibody of Claim 1 in an amount effective to treat the infectious disease.

18. The method of Claim 17, wherein the infectious disease is a viral infection.

19. Use of the anti-Tigit antibody molecules of any one of Claim 1-11 in manufacturing medicine for treating a cancer, a tumor or an infectious disease.