CLAIMS

What is claimed is:

1. An antibody or antigen-binding fragment thereof which has specificity to the human 5T4 oncofetal trophoblast glycoprotein (5T4) protein and comprises a heavy chain variable region (VH) comprising a VH CDR1, a VH CDR2 and a VH CDR3, and a light chain variable region (VL) comprising a VL CDR1, a VL CDR2, and a VL CDR3, wherein the VH CDR1, VH CDR2, VH CDR3, VL CDR1, VL CDR2 and VL CDR3 comprise, respectively, the amino acid sequences of

SEQ ID NO: 54, 55 (or any one of 60-63, or 266 or 267), 56, 57, 58 and 59;
SEQ ID NO: 123, 124 or 129, 125, 126, 127 and 128; or
SEQ ID NO: 160, 161 or 166, 162, 163, 164 and 165.

2. The antibody or antigen-binding fragment thereof of claim 1, wherein:
the VH CDR1 comprises the amino acid sequence of SEQ ID NO: 54;
the VH CDR2 comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 55, 60-63 and 266-267;
the VH CDR3 comprises the amino acid sequence of SEQ ID NO: 56;
the VL CDR1 comprises the amino acid sequence of SEQ ID NO: 57;
the VL CDR2 comprises the amino acid sequence of SEQ ID NO: 58; and
the VL CDR3 comprises the amino acid sequence of SEQ ID NO: 59.

3. The antibody or antigen-binding fragment thereof of claim 2, wherein the VH comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 3, 215-221 and 248-256, and the VL comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 4 and 222-226.

4. The antibody or antigen-binding fragment thereof of claim 1, wherein:
the VH CDR1 comprises the amino acid sequence of SEQ ID NO: 123;
the VH CDR2 comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 124 and 129;
the VH CDR3 comprises the amino acid sequence of SEQ ID NO: 125;
the VL CDR1 comprises the amino acid sequence of SEQ ID NO: 126;

the VL CDR2 comprises the amino acid sequence of SEQ ID NO: 127; and

the VL CDR3 comprises the amino acid sequence of SEQ ID NO: 128.

5. The antibody or antigen-binding fragment thereof of claim 4, wherein the VH comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 23, 236-241 and 259-261, and the VL comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 24 and 242-247.

6. The antibody or antigen-binding fragment thereof of claim 1, wherein:

the VH CDR1 comprises the amino acid sequence of SEQ ID NO: 160;

the VH CDR2 comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 161 and 166;

the VH CDR3 comprises the amino acid sequence of SEQ ID NO: 162;

the VL CDR1 comprises the amino acid sequence of SEQ ID NO: 163;

the VL CDR2 comprises the amino acid sequence of SEQ ID NO: 164; and

the VL CDR3 comprises the amino acid sequence of SEQ ID NO: 165.

7. The antibody or antigen-binding fragment thereof of claim 6, wherein the VH comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 35, and the VL comprises an amino acid sequence selected from the group consisting of SEQ ID NO: 36.

8. The antibody or fragment thereof of any one of claims 1-7, wherein the antibody or fragment thereof is a bivalent Fab antibody, or a fragment selected from the group consisting of F(ab')2, F(ab)2, Fab', Fab, Fv, and scFv.

9. An antibody-drug conjugate comprising an antibody or fragment thereof of any one of claims 1-8 conjugated to a drug moiety.

10. The antibody-drug conjugate of claim 9, wherein the drug moiety is a cytotoxic or cytostatic agent.

11. The antibody-drug conjugate of claim 10, wherein the drug moiety is a maytansinoid, an auristatin, or a macrocyclic ketone analogue.

12. The antibody-drug conjugate of claim 11, wherein the drug moiety comprises monomethyl auristatin E (MMAE) or monomethyl auristatin F (MMAF).

13. The antibody-drug conjugate of any one of claims 9-12, wherein the drug moiety is attached to the antibody or fragment thereof through a linker that is hydrolyzable under acidic conditions.

14. A multispecific antibody comprising an antigen-binding fragment of any one of claims 1-8 and one or more antibody or antigen-binding fragment having binding specificity to a target antigen that is not 5T4.

15. A chimeric antigen receptor (CAR) comprising an antigen-binding fragment of any one of claims 1-8, a transmembrane domain, a costimulatory domain, and a CD3ξ intracellular domain.

16. One or more polynucleotide(s) encoding the antibody or antigen-binding fragment thereof of any one of claims 1-8 or the CAR of claim 15.

17. The polynucleotide(s) of claim 16, which is one or more mRNA.

18. The polynucleotide(s) of claim 17, wherein the mRNA is chemically modified.

19. A cell comprising the polynucleotide(s) of any one of claims 16-18.

20. A composition comprising the antibody or antigen-binding fragment thereof of any one of claims 1-8, the antibody-drug conjugate of any one of claims 9-13, the multispecific antibody of claim 14, the CAR of claim 15, the polynucleotide(s) of any one of claims 16-18, or the cell of claim 19, and a pharmaceutically acceptable carrier.

21. Use of the antibody or antigen-binding fragment thereof of any one of claims 1-8, the antibody-drug conjugate of any one of claims 9-13, the multispecific antibody of claim 14,

the CAR of claim 15, the polynucleotide(s) of any one of claims 16-18, the cell of claim 19, or the composition of claim 20, for the preparation of a medicament for treating cancer.