WHAT IS CLAIMED IS:

1. An antibody or antigen-binding fragment thereof that binds to 4-1BB (TNF Receptor Superfamily Member 9) comprising:

a heavy chain variable region (VH) comprising complementarity determining regions (CDRs) 1, 2, and 3, wherein the VH CDR1 region comprises an amino acid sequence that is at least 80% identical to a selected VH CDR1 amino acid sequence, the VH CDR2 region comprises an amino acid sequence that is at least 80% identical to a selected VH CDR2 amino acid sequence, and the VH CDR3 region comprises an amino acid sequence that is at least 80% identical to a selected VH CDR3 amino acid sequence; and

a light chain variable region (VL) comprising CDRs 1, 2, and 3, wherein the VL CDR1 region comprises an amino acid sequence that is at least 80% identical to a selected VL CDR1 amino acid sequence, the VL CDR2 region comprises an amino acid sequence that is at least 80% identical to a selected VL CDR2 amino acid sequence, and the VL CDR3 region comprises an amino acid sequence that is at least 80% identical to a selected VL CDR3 amino acid sequence,

wherein the selected VH CDRs 1, 2, and 3 amino acid sequences and the selected VL CDRs, 1, 2, and 3 amino acid sequences are one of the following:

(1) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 1, 2, 3, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 4, 5, 6, respectively;

(2) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 7, 8, 9, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 10, 11, 12, respectively;

(3) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 13, 14, 15, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 16, 17, 18, respectively;

(4) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 19, 20, 21, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 22, 23, 24, respectively;

(5) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 25, 26, 27, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 28, 29, 30, respectively;

(6) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 31, 32, 33, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 34, 35, 36, respectively;

(7) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 37, 38, 39, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 40, 41, 42, respectively;

(8) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 43, 44, 45, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 46, 47, 48, respectively;

(9) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 49, 50, 51, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 52, 53, 54, respectively;

(10) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 55, 56, 57, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 58, 59, 60, respectively;

(11) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 61, 62, 63, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 64, 65, 66, respectively;

(12) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 67, 68, 69, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 70, 71, 72, respectively;

(13) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 73, 74, 75, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 76, 77, 78, respectively;

(14) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 79, 80, 81, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 82, 83, 84, respectively;

(15) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 85, 86, 87, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 88, 89, 90, respectively;

(16) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 91, 92, 93, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 94, 95, 96, respectively;

(17) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 97, 98, 99, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 100, 101, 102, respectively;

(18) the selected VH CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 103, 104, 105, respectively, and the selected VL CDRs 1, 2, 3 amino acid sequences are set forth in SEQ ID NOs: 106, 107, 108, respectively.

2. The antibody or antigen-binding fragment thereof of claim 1, characterized by one or more of the following:

(1) the VH comprises CDRs 1, 2, 3 with the amino acid sequences set forth in SEQ ID NOs: 1, 2, and 3 respectively, and the VL comprises CDRs 1, 2, 3 with the amino acid sequences set forth in SEQ ID NOs: 4, 5, and 6, respectively;

(2) the VH comprises CDRs 1, 2, 3 with the amino acid sequences set forth in SEQ ID NOs: 7, 8, and 9, respectively, and the VL comprises CDRs 1, 2, 3 with the amino acid sequences set forth in SEQ ID NOs: 10, 11, and 12, respectively;

(3) the VH comprises CDRs 1, 2, 3 with the amino acid sequences set forth in SEQ ID NOs: 13, 14, and 15, respectively, and the VL comprises CDRs 1, 2, 3 with the amino acid sequences set forth in SEQ ID NOs: 16, 17, and 18, respectively;

(4) the antibody or antigen-binding fragment specifically binds to human 4-1BB;

(5) the antibody or antigen-binding fragment is a humanized antibody or antigen-binding fragment thereof; and

(6) the antibody or antigen-binding fragment is a single-chain variable fragment (scFv);

(7) the antibody is a IgG1 antibody; or

(8) the antibody is a human IgG1 antibody.

3. An antibody or antigen-binding fragment thereof that binds to 4-1BB comprising a heavy chain variable region (VH) comprising an amino acid sequence that is at least 90% identical to a selected VH sequence, and a light chain variable region (VL) comprising an amino acid sequence that is at least 90% identical to a selected VL sequence, wherein the selected VH sequence and the selected VL sequence are one of the following:

(1) the selected VH sequence is SEQ ID NOs: 221, 222, 223, 224, or 243, and the selected VL sequence is SEQ ID NOs: 225, 226, 227, 228, or 244;

(2) the selected VH sequence is SEQ ID NOs: 229, 230, 231, or 245, and the selected VL sequence is SEQ ID NOs: 232, 233, 234, 235, or 246;

(3) the selected VH sequence is SEQ ID NO: 236, 237, 238, or 247, and the selected VL sequence is SEQ ID NO: 239, 240, 241, 242, or 248;

(4) the selected VH sequence is SEQ ID NO: 249, and the selected VL sequence is SEQ ID NO: 250;

(5) the selected VH sequence is SEQ ID NO: 251, and the selected VL sequence is SEQ ID NO: 252;

(6) the selected VH sequence is SEQ ID NO: 253, and the selected VL sequence is SEQ ID NO: 254;

(7) the selected VH sequence is SEQ ID NO: 255, and the selected VL sequence is SEQ ID NO: 256;

(8) the selected VH sequence is SEQ ID NO: 257, and the selected VL sequence is SEQ ID NO: 258;

(9) the selected VH sequence is SEQ ID NO: 259, and the selected VL sequence is SEQ ID NO: 260;

(10) the selected VH sequence is SEQ ID NO: 261, and the selected VL sequence is SEQ ID NO: 262;

(11) the selected VH sequence is SEQ ID NO: 263, and the selected VL sequence is SEQ ID NO: 264;

(12) the selected VH sequence is SEQ ID NO: 265, and the selected VL sequence is SEQ ID NO: 266;

(13) the selected VH sequence is SEQ ID NO: 267, and the selected VL sequence is SEQ ID NO: 268;

(14) the selected VH sequence is SEQ ID NO: 269, and the selected VL sequence is SEQ ID NO: 270;

(15) the selected VH sequence is SEQ ID NO: 271, and the selected VL sequence is SEQ ID NO: 272;

(16) the selected VH sequence is SEQ ID NO: 273, and the selected VL sequence is SEQ ID NO: 274;

(17) the selected VH sequence is SEQ ID NO: 275, and the selected VL sequence is SEQ ID NO: 276; or

(18) the selected VH sequence is SEQ ID NO: 277, and the selected VL sequence is SEQ ID NO: 278.

4. The antibody or antigen-binding fragment thereof of claim 3, characterized by one or more of the following:

(1) wherein the VH comprises the sequence of SEQ ID NO: 236 and the VL comprises the sequence of SEQ ID NO: 240; or, wherein the VH comprises the sequence of SEQ ID NO: 221 and the VL comprises the sequence of SEQ ID NO: 225;

(2) the antibody or antigen-binding fragment specifically binds to human 4-1BB;

(3) the antibody or antigen-binding fragment is a humanized antibody or antigen-binding fragment thereof;

(4) the antibody or antigen-binding fragment is a single-chain variable fragment (scFv);

(5) the antibody is a IgG1 antibody; or

(6) the antibody is a human IgG1 antibody.

5. An antibody-drug conjugate comprising the antibody or antigen-binding fragment thereof of any one of claims 1-4 covalently bound to a therapeutic agent.

6. The antibody drug conjugate of claim 5, wherein the therapeutic agent is a cytotoxic or cytostatic agent.

7. A nucleic acid comprising a polynucleotide encoding a polypeptide comprising:

(1) an immunoglobulin heavy chain or a fragment thereof comprising a heavy chain variable region (VH) comprising complementarity determining regions (CDRs) 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 1, 2, and 3, respectively, and wherein the VH, when paired with a light chain variable region (VL) comprising the amino acid sequence set forth in SEQ ID NO: 225, 226, 227, 228, or 244 binds to 4-1BB;

(2) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 4, 5, and 6, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 221, 222, 223, 224, or 243 binds to 4-1BB;

(3) an immunoglobulin heavy chain or a fragment thereof comprising a heavy chain variable region (VH) comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 7, 8, and 9, respectively, and wherein the VH, when paired with a light chain variable region (VL) comprising the amino acid sequence set forth in SEQ ID NO: 232, 233, 234, 235, or 246 binds to 4-1BB;

(4) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 10, 11, and 12, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 229, 230, 231, or 245 binds to 4-1BB;

(5) an immunoglobulin heavy chain or a fragment thereof comprising a heavy chain variable region (VH) comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 13, 14, and 15, respectively, and wherein the VH, when paired with a light chain variable region (VL) comprising the amino acid sequence set forth in SEQ ID NO: 239, 240, 241, 242, or 248 binds to 4-1BB;

(6) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs:

16, 17, and 18, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 236, 237, 238, or 247 binds to 4-1BB;

(7) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 19, 20, 21, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 250 binds to 4-1BB;

(8) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 22, 23, 24, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 249 binds to 4-1BB;

(9) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 25, 26, 27, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 252 binds to 4-1BB;

(10) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 28, 29, 30, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 251 binds to 4-1BB;

(11) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 31, 32, 33, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 254 binds to 4-1BB;

(12) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 34, 35, 36, respectively, and wherein the VL, when paired with a

VH comprising the amino acid sequence set forth in SEQ ID NO: 253 binds to 4-1BB;

(13) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 37, 38, 39, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 256 binds to 4-1BB;

(14) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 40, 41, 42, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 255 binds to 4-1BB;

(15) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 43, 44, 45, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 258 binds to 4-1BB;

(16) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 46, 47, 48, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 257 binds to 4-1BB;

(17) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 49, 50, 51, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 260 binds to 4-1BB;

(18) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 52, 53, 54, respectively, and wherein the VL, when paired with a

VH comprising the amino acid sequence set forth in SEQ ID NO: 259 binds to 4-1BB;

(19) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 55, 56, 57, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 262 binds to 4-1BB;

(20) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 58, 59, 60, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 261 binds to 4-1BB;

(21) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 61, 62, 63, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 264 binds to 4-1BB;

(22) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 64, 65, 66, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 263 binds to 4-1BB;

(23) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 67, 68, 69, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 266 binds to 4-1BB;

(24) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 70, 71, 72, respectively, and wherein the VL, when paired with a

VH comprising the amino acid sequence set forth in SEQ ID NO: 265 binds to 4-1BB;

(25) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 73, 74, 75, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 268 binds to 4-1BB;

(26) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 76, 77, 78, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 267 binds to 4-1BB;

(27) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 79, 80, 81, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 270 binds to 4-1BB;

(28) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 82, 83, 84, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 269 binds to 4-1BB;

(29) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 85, 86, 87, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 272 binds to 4-1BB;

(30) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 88, 89, 90, respectively, and wherein the VL, when paired with a

VH comprising the amino acid sequence set forth in SEQ ID NO: 271 binds to 4-1BB;

(31) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 91, 92, 93, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 274 binds to 4-1BB;

(32) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 94, 95, 96, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 273 binds to 4-1BB;

(33) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 97, 98, 99, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 276 binds to 4-1BB;

(34) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 100, 101, 102, respectively, and wherein the VL, when paired with a VH comprising the amino acid sequence set forth in SEQ ID NO: 275 binds to 4-1BB;

(35) an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 103, 104, 105, respectively, and wherein the VH, when paired with a VL comprising the amino acid sequence set forth in SEQ ID NO: 278 binds to 4-1BB; or

(36) an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 106, 107, 108, respectively, and wherein the VL, when paired with

a VH comprising the amino acid sequence set forth in SEQ ID NO: 277 binds to 4-1BB.

8. The nucleic acid of claim 7, characterized by one of the following:

(1) the nucleic acid comprises a polynucleotide encoding a polypeptide comprising an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 1, 2, and 3, respectively;

(2) the nucleic acid comprises a polynucleotide encoding a polypeptide comprising an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 4, 5, and 6, respectively;

(3) the nucleic acid comprises a polynucleotide encoding a polypeptide comprising an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 7, 8, and 9, respectively;

(4) the nucleic acid comprises a polynucleotide encoding a polypeptide comprising an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 10, 11, and 12, respectively;

(5) the nucleic acid comprises a polynucleotide encoding a polypeptide comprising an immunoglobulin heavy chain or a fragment thereof comprising a VH comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 13, 14, and 15, respectively; or

(6) the nucleic acid comprises a polynucleotide encoding a polypeptide comprising an immunoglobulin light chain or a fragment thereof comprising a VL comprising CDRs 1, 2, and 3 comprising the amino acid sequences set forth in SEQ ID NOs: 16, 17, and 18, respectively.

9. The nucleic acid of claim 7, characterized by one or more of the following:

(1) the VH when paired with a VL specifically binds to human 4-1BB, or the VL when paired with a VH specifically binds to human 4-1BB;

(2) the immunoglobulin heavy chain or the fragment thereof is a humanized immunoglobulin heavy chain or a fragment thereof, and the immunoglobulin light chain or the fragment thereof is a humanized immunoglobulin light chain or a fragment thereof;

(3) the nucleic acid encodes a single-chain variable fragment (scFv); or

(4) the nucleic acid is cDNA.

10. A vector comprising,

(1) one or more of the nucleic acids of claim 7; or

(2) two of the nucleic acids of claim 7, wherein the vector encodes the VL region and the VH region that together bind to 4-1BB.

11. A pair of vectors, wherein each vector comprises one of the nucleic acids of claim 7, wherein together the pair of vectors encodes the VL region and the VH region that together bind to 4-1BB.

12. A cell comprising,

(1) one or two or more of the nucleic acids of anyone of claims 7-9; or

(2) the vector of claim 10, or

(3) the pair of vectors of claim 11.

13. The cell of claim 12, characterized by one or both of the following:

(1) the cell is a CHO cell; or

(2) the cell comprises two of the nucleic acids, wherein the two nucleic acids together encode the VL region and the VH region that together bind to 4-1BB.

14. A method of producing an antibody or an antigen-binding fragment thereof, the method comprising

(a) culturing the cell of claim 12 under conditions sufficient for the cell to produce the antibody or the antigen-binding fragment; and

(b) collecting the antibody or the antigen-binding fragment produced by the cell.

15. Use of the antibody or antigen-binding fragment thereof of any one of claims 1-4 or the antibody-drug conjugate of claim 5 or 6 in the manufacture a medicament, wherein the medicament is used for:

(1) treating a subject having a cancer;

(2) decreasing the rate of tumor growth in a subject in need thereof; or

(3) killing a tumor cell in a subject in need thereof.

16. Use of claim 15, characterized by one or more of the following:

(1) the subject has a solid tumor;

(2) the cancer is breast cancer, oropharyngeal cancer, ovarian cancer, B cell lymphoma, or Non-Hodgkin's lymphoma; or

(3) the cancer is non-small cell lung cancer (NSCLC), melanoma, B-cell non-Hodgkin lymphoma, colorectal cancer, or multiple myeloma.

17. A pharmaceutical composition comprising the antibody or antigen-binding fragment thereof of any one of claims 1-4 or the antibody-drug conjugate of claim 5 or 6, and a pharmaceutically acceptable carrier.

18. An IgG1 antibody or antigen-binding fragment thereof that binds to 4-1BB comprising:

a heavy chain variable region (VH) comprising complementarity determining regions (CDRs) 1, 2, and 3, wherein the VH CDR1 region comprises an amino acid sequence that is at least 80% identical to a selected VH CDR1 amino acid sequence, the VH CDR2 region comprises an amino acid sequence that is at least 80% identical to a selected VH CDR2 amino acid sequence, and the VH CDR3 region comprises an amino acid sequence that is at least 80% identical to a selected VH CDR3 amino acid sequence; and

a light chain variable region (VL) comprising CDRs 1, 2, and 3, wherein the VL CDR1 region comprises an amino acid sequence that is at least 80% identical to a

selected VL CDR1 amino acid sequence, the VL CDR2 region comprises an amino acid sequence that is at least 80% identical to a selected VL CDR2 amino acid sequence, and the VL CDR3 region comprises an amino acid sequence that is at least 80% identical to a selected VL CDR3 amino acid sequence,

wherein the selected VH CDRs 1, 2, and 3 amino acid sequences and the selected VL CDRs, 1, 2, and 3 amino acid sequences are selected from one of the antibodies as set forth in Table 3.

19. Use of an anti-4-1BB IgG1 antibody or antigen-binding fragment thereof with an anti-PD-1 antibody or antigen-binding fragment thereof or an anti-CTLA4 antibody or antigen-binding fragment thereof in the manufacture a medicament for treating a subject having a cancer.

20. Use of claim 19, characterized by one of the following:

(1) the anti-PD-1 antibody is an anti-PD-1 IgG4 antibody;

(2) the anti-PD-1 antibody is pembrolizumab;

(3) the anti-CTLA4 antibody is an anti-CTLA IgG1 antibody or an anti-CTLA IgG2 antibody; or

(4) the anti-CTLA4 antibody is ipilimumab or tremelimumab.