

Claims

[1] ~~An antibody that binds specifically to human HLA/NY-ESO or a binding fragment thereof comprising:~~

~~a heavy chain CDRH1 consisting of the amino acid sequence as shown in SEQ ID NO: 54,~~

~~a heavy chain CDRH2 consisting of the amino acid sequence as shown in SEQ ID NO: 55,~~

~~a heavy chain CDRH3 consisting of the amino acid sequence as shown in SEQ ID NO: 56,~~

~~a light chain CDRL1 consisting of the amino acid sequence as shown in SEQ ID NO: 57 or a light chain CDRL1 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 57 in which amino acid 7 is W and/or amino acid 8 is K,~~

~~a light chain CDRL2 consisting of the amino acid sequence as shown in SEQ ID NO: 58, and~~

~~a light chain CDRL3 consisting of the amino acid sequence as shown in SEQ ID NO: 59 or a light chain CDRL3 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 59 in which amino acid 2 is A or S.~~

[2] ~~The antibody according to Claim 1 comprising CDRH1 to CDRH3 and CDRL1 to CDRL3 of one or more groups selected from the group consisting of the groups (i) to (v) below or a binding fragment thereof:~~

~~(i) a heavy chain CDRH1 consisting of the amino acid sequence as shown in SEQ ID NO: 54,~~

~~a heavy chain CDRH2 consisting of the amino acid sequence as shown in SEQ ID NO: 55,~~

~~a heavy chain CDRH3 consisting of the amino acid sequence as shown in SEQ ID NO: 56,~~

~~a light chain CDRL1 consisting of the amino acid sequence as shown in SEQ ID NO: 57,~~

~~a light chain CDRL2 consisting of the amino acid sequence as shown in SEQ ID NO:~~

58, and

~~a light chain CDRL3 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~59;~~

~~(ii) a heavy chain CDRH1 consisting of the amino acid sequence as shown in SEQ ID~~

~~NO: 54,~~

~~a heavy chain CDRH2 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~55,~~

~~a heavy chain CDRH3 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~56,~~

~~a light chain CDRL1 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 57 in which amino acid 7 is W,~~

~~a light chain CDRL2 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~58, and~~

~~a light chain CDRL3 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~59;~~

~~(iii) a heavy chain CDRH1 consisting of the amino acid sequence as shown in SEQ ID~~

~~NO: 54,~~

~~a heavy chain CDRH2 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~55,~~

~~a heavy chain CDRH3 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~56,~~

~~a light chain CDRL1 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~57,~~

~~a light chain CDRL2 consisting of the amino acid sequence as shown in SEQ ID NO:~~

~~58, and~~

~~a light chain CDRL3 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 59 in which amino acid 2 is A;~~

~~(iv) a heavy chain CDRH1 consisting of the amino acid sequence as shown in SEQ ID~~

~~NO: 54,~~

~~a heavy chain CDRH2 consisting of the amino acid sequence as shown in SEQ ID NO:~~

55,

a heavy chain CDRH3 consisting of the amino acid sequence as shown in SEQ ID NO:

56,

a light chain CDRL1 consisting of the amino acid sequence as shown in SEQ ID NO:

57,

a light chain CDRL2 consisting of the amino acid sequence as shown in SEQ ID NO:

58, and

a light chain CDRL3 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 59 in which amino acid 2 is S; and

(v) a heavy chain CDRH1 consisting of the amino acid sequence as shown in SEQ ID NO: 54,

a heavy chain CDRH2 consisting of the amino acid sequence as shown in SEQ ID NO: 55,

a heavy chain CDRH3 consisting of the amino acid sequence as shown in SEQ ID NO: 56,

a light chain CDRL1 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 57 in which amino acid 7 is W and amino acid 8 is K,

a light chain CDRL2 consisting of the amino acid sequence as shown in SEQ ID NO: 58, and

a light chain CDRL3 consisting of the amino acid sequence as shown in SEQ ID NO: 59.

[3] The antibody or the binding fragment thereof according to Claim 1 comprising a heavy chain variable region consisting of an amino acid sequence having 95% or higher sequence identity to an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 27 or the amino acid sequence as shown in SEQ ID NO: 38 or 39 and a light chain variable region consisting of an amino acid sequence having 95% or higher sequence identity to an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 27 or SEQ ID NO: 52 or the amino acid sequence as shown in SEQ ID NO: 40.

[4] The antibody or the binding fragment thereof according to Claim 1 comprising:

~~(H1) a heavy chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 6;~~

~~(H2) a heavy chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 18;~~

~~(H3) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 29;~~

~~(H4) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 26;~~

~~(H5) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 27;~~

~~(H6) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 28;~~

~~(H7) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 36;~~

~~(H8) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 47;~~

~~(H9) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 48;~~

~~(H10) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 50;~~

~~(H11) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 51;~~

~~(H12) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 52;~~

~~(H13) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 53;~~

~~(H14) a heavy chain variable region: consisting of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 30; or~~

~~(H15) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 156; and~~

~~(L1) a light chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 8;~~

~~(L2) a light chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 20;~~

~~(L3) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 29;~~

~~(L4) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 26;~~

~~(L5) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 27;~~

~~(L6) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 28;~~

~~(L7) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 36;~~

~~(L8) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 47;~~

~~(L9) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 48;~~

~~(L10) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 50;~~

~~(L11) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 51;~~

~~(L12) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 52;~~

~~(L13) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 53;~~

~~(L14) a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 30; or~~

~~(L15) a light chain variable region consisting of an amino acid sequence of amino acids 161 to 271 of the amino acid sequence as shown in SEQ ID NO: 156.~~

[5] The antibody or the binding fragment thereof according to Claim 4 comprising:

(H1L1) a heavy chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 6 and a light chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 8,

(H2L2) a heavy chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 18 and a light chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 20,

(H3L3) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 29 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 29,

(H4L4) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 26 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 26,

(H5L5) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 27 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 27,

(H6L6) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 28 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 28,

(H7L7) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 36 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 36,

(H8L8) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 47 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino

acid sequence as shown in SEQ ID NO: 47,

(H9L9) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 48 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 48,

(H10L10) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 50 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 50,

(H11L11) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 51 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 51,

(H12L12) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 52 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 52,

(H13L13) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 53 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 53,

(H14L14) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 30 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 30, or

(H15L14) a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 156 and a light chain variable region consisting of an amino acid sequence of amino acids 161 to 271 of the amino acid sequence as shown in SEQ ID NO: 156.

[6] The antibody or the binding fragment thereof according to any one of Claims 1 to 5,

which is scFv.

[7] The antibody or the binding fragment thereof according to Claim 6, which is

(s1) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 70,~~

(s2) ~~scFv comprising a heavy chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 18 and a light chain variable region consisting of the amino acid sequence as shown in SEQ ID NO: 20,~~

(s3) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 29,~~

(s4) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 26,~~

(s5) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 27,~~

(s6) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 28,~~

(s7) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 36,~~

(s8) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 47,~~

(s9) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 48,~~

(s10) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 50,~~

(s11) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 51,~~

(s12) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 52,~~

(s13) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 53,~~

(s14) ~~scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino~~

~~acid sequence as shown in SEQ ID NO: 30, or~~

~~(s15) scFv consisting of an amino acid sequence of amino acids 21 to 271 of the amino acid sequence as shown in SEQ ID NO: 156.~~

[8] ~~A polynucleotide encoding the antibody or the binding fragment thereof according to any one of Claims 1 to 7.~~

[9] ~~A vector comprising the polynucleotide according to Claim 8.~~

[10] ~~A host cell comprising the polynucleotide according to Claim 8 or the vector according to Claim 9.~~

[11] ~~A method for producing an antibody that binds specifically to human HLA/NY-ESO or a binding fragment thereof comprising: (i) a step of culturing the host cell according to Claim 10; and (ii) a step of purifying an antibody or a binding fragment thereof from the culture product obtained in step (i).~~

[12] ~~An antibody that binds specifically to human HLA/NY-ESO or a binding fragment thereof, which is obtained by the method according to Claim 11.~~

[13] ~~An antibody that has the properties (i) or (ii) below and binds to HLA-A2/NY-ESO or a binding fragment thereof:~~

~~(i) binding to a site on HLA-A2/NY-ESO recognized by the antibody or the binding fragment thereof according to Claim 7; or~~

~~(ii) binding to human HLA-A2/NY-ESO competitively with the antibody or the binding fragment thereof according to Claim 7.~~

[14] ~~A pharmaceutical composition comprising, as an active ingredient, the antibody or the binding fragment thereof according to any one of Claims 1 to 7, 12, and 13, the polynucleotide according to Claim 8, the vector according to Claim 9, or the cell according to Claim 10.~~

[15] ~~A molecule that binds specifically to human HLA/NY-ESO comprising the antibody or the binding fragment thereof according to any one of Claims 1 to 7, 12, and 13.~~

[16] ~~The molecule according to Claim 15, which is a multispecific antibody.~~

[17] ~~The molecule according to Claim 15, which is a bispecific antibody.~~

[18] ~~The molecule according to any one of Claims 15 to 17, which comprises an antibody that binds specifically to CD3 or a binding fragment thereof.~~

[19] ~~The molecule according to Claim 18, wherein the antibody that binds specifically to~~

CD3 or the binding fragment thereof comprises:

~~(CCH1) a heavy chain CDRH1 consisting of the amino acid sequence as shown in SEQ ID NO: 141;~~

~~(CCH2) a heavy chain CDRH2 consisting of the amino acid sequence as shown in SEQ ID NO: 142 or a heavy chain CDRH2 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 142 in which amino acid 3 is N or S;~~

~~(CCH3) a heavy chain CDRH3 consisting of the amino acid sequence as shown in SEQ ID NO: 143;~~

~~(CCL1) a light chain CDRL1 consisting of the amino acid sequence as shown in SEQ ID NO: 144;~~

~~(CCL2) a light chain CDRL2 consisting of the amino acid sequence as shown in SEQ ID NO: 145 or a light chain CDRL2 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 145 in which amino acid 2 is N; and~~

~~(CCL3) a light chain CDRL3 consisting of the amino acid sequence as shown in SEQ ID NO: 146.~~

[20] ~~The molecule according to Claim 19, wherein the antibody that binds specifically to CD3 or the binding fragment thereof comprises:~~

~~(CH1) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 136;~~

~~(CH2) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 137;~~

~~(CH3) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 147;~~

~~(CH4) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 138;~~

~~(CH5) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 139;~~

~~(CH6) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 140;~~

~~(CH7) a heavy chain variable region consisting of an amino acid sequence of amino~~

acids 272 to 389 of the amino acid sequence as shown in SEQ ID NO: 155;

~~(CH8) a heavy chain variable region consisting of an amino acid sequence of amino acids 277 to 394 of the amino acid sequence as shown in SEQ ID NO: 156; or~~

~~(CH9) a heavy chain variable region consisting of an amino acid sequence of amino acids 277 to 394 of the amino acid sequence as shown in SEQ ID NO: 157; and~~

~~(CL1) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 136;~~

~~(CL2) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 241 of the amino acid sequence as shown in SEQ ID NO: 137;~~

~~(CL3) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 147;~~

~~(CL4) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 241 of the amino acid sequence as shown in SEQ ID NO: 138;~~

~~(CL5) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 139;~~

~~(CL6) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 140;~~

~~(CL7) a light chain variable region consisting of an amino acid sequence of amino acids 405 to 511 of the amino acid sequence as shown in SEQ ID NO: 155;~~

~~(CL8) a light chain variable region consisting of an amino acid sequence of amino acids 410 to 516 of the amino acid sequence as shown in SEQ ID NO: 156; or~~

~~(CL9) a light chain variable region consisting of an amino acid sequence of amino acids 410 to 516 of the amino acid sequence as shown in SEQ ID NO: 157.~~

[21] ~~The molecule according to Claim 20, wherein the antibody that binds specifically to CD3 or the binding fragment thereof comprises:~~

~~(CH1CL1) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 136 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 136;~~

~~(CH2CL2) a heavy chain variable region consisting of an amino acid sequence of~~

amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 137 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 241 of the amino acid sequence as shown in SEQ ID NO: 137;

~~(CH3CL3) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 147 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 147;~~

~~(CH4CL4) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 138 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 241 of the amino acid sequence as shown in SEQ ID NO: 138;~~

~~(CH5CL5) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 139 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 139;~~

~~(CH6CL6) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 140 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 140;~~

~~(CH7CL7) a heavy chain variable region consisting of an amino acid sequence of amino acids 272 to 389 of the amino acid sequence as shown in SEQ ID NO: 155 and a light chain variable region consisting of an amino acid sequence of amino acids 405 to 511 of the amino acid sequence as shown in SEQ ID NO: 155;~~

~~(CH8CL8) a heavy chain variable region consisting of an amino acid sequence of amino acids 277 to 394 of the amino acid sequence as shown in SEQ ID NO: 156 and a light chain variable region consisting of an amino acid sequence of amino acids 410 to 516 of the amino acid sequence as shown in SEQ ID NO: 156; or~~

~~(CH9CL9) a heavy chain variable region consisting of an amino acid sequence of amino acids 277 to 394 of the amino acid sequence as shown in SEQ ID NO: 157 and a light chain variable region consisting of an amino acid sequence of amino acids 410 to 516 of the~~

amino acid sequence as shown in SEQ ID NO: 157.

[22] The molecule according to any one of Claims 18 to 21, wherein the antibody that binds specifically to CD3 or the binding fragment thereof is scFv.

[23] The molecule according to Claim 22, wherein scFv comprises:

(CS1) scFv consisting of an amino acid sequence of amino acids 2 to 243 of the amino acid sequence as shown in SEQ ID NO: 136;

(CS2) scFv consisting of an amino acid sequence of amino acids 2 to 241 of the amino acid sequence as shown in SEQ ID NO: 137;

(CS3) scFv consisting of an amino acid sequence of amino acids 2 to 243 of the amino acid sequence as shown in SEQ ID NO: 147;

(CS4) scFv consisting of an amino acid sequence of amino acids 2 to 241 of the amino acid sequence as shown in SEQ ID NO: 138;

(CS5) scFv consisting of an amino acid sequence of amino acids 2 to 243 of the amino acid sequence as shown in SEQ ID NO: 139;

(CS6) scFv consisting of an amino acid sequence of amino acids 2 to 243 of the amino acid sequence as shown in SEQ ID NO: 140;

(CS7) scFv consisting of an amino acid sequence of amino acids 272 to 511 of the amino acid sequence as shown in SEQ ID NO: 155;

(CS8) scFv consisting of an amino acid sequence of amino acids 277 to 516 of the amino acid sequence as shown in SEQ ID NO: 156; or

(CS9) scFv consisting of an amino acid sequence of amino acids 277 to 516 of the amino acid sequence as shown in SEQ ID NO: 157.

[24] The molecule according to any one of Claims 18 to 23 comprising: a first polypeptide comprising scFv that binds specifically to human HLA/NY-ESO, scFv that binds specifically to CD3, and an Fe region (i) in that order from the N terminus toward the C terminus; and a second polypeptide comprising an Fe region (ii), wherein the first polypeptide is associated with the second polypeptide at the Fe region (i) and the Fe region (ii).

[25] The molecule according to Claim 24, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 1, which is scFv.

[26] ~~The molecule according to Claim 24, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 2, which is scFv.~~

[27] ~~The molecule according to Claim 24, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 3, which is scFv.~~

[28] ~~The molecule according to Claim 24, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 4, which is scFv.~~

[29] ~~The molecule according to Claim 24, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 5, which is scFv.~~

[30] ~~The molecule according to any one of Claims 19 to 24, wherein the scFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 18, which is scFv.~~

[31] ~~The molecule according to any one of Claims 19 to 24, wherein the scFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 19, which is scFv.~~

[32] ~~The molecule according to any one of Claims 19 to 24, wherein the scFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 20 or 21, which is scFv.~~

[33] ~~The molecule according to any one of Claims 19 to 24, wherein the scFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 23, which is scFv.~~

[34] ~~The molecule according to any one of Claims 24 to 33 comprising an amino acid sequence selected from the group consisting of an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 85, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 87, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 88, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO:~~

~~89, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 90, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 91, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 92, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 93, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 94, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 95, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 96, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 86, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 149, and an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 150.~~

[35] ~~The molecule according to any one of Claims 24 to 33, which comprises an amino acid sequence selected from the group consisting of an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 155, an amino acid sequence of amino acids 21 to 516 of the amino acid sequence as shown in SEQ ID NO: 156, and an amino acid sequence of amino acids 21 to 516 of the amino acid sequence as shown in SEQ ID NO: 157.~~

[36] ~~The molecule according to any one of Claims 24 to 34, wherein the first polypeptide comprises an amino acid sequence of amino acids 529 to 745 of the amino acid sequence as shown in SEQ ID NO: 85, 87, 88, 89, 90, 91, 92, 93, 94, 95, 96, 86, 149, or 150.~~

[37] ~~The molecule according to any one of Claims 24 to 33 and 35, wherein the first polypeptide comprises an amino acid sequence of amino acids 529 to 745 of the amino acid sequence as shown in SEQ ID NO: 155, an amino acid sequence of amino acids 534 to 750 of the amino acid sequence as shown in SEQ ID NO: 156, or an amino acid sequence of amino acids 534 to 750 of the amino acid sequence as shown in SEQ ID NO: 157.~~

[38] ~~The molecule according to Claim 34 or 36, wherein the first polypeptide consists of an amino acid sequence selected from the group consisting of an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 85, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 87, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO:~~

~~88, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 89, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 90, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 91, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 92, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 93, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 94, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 95, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 96, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 86, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 149, and an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 150.~~

[39] ~~The molecule according to Claim 35 or 37, wherein the first polypeptide consists of an amino acid sequence selected from the group consisting of an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 155, an amino acid sequence of amino acids 20 to 750 of the amino acid sequence as shown in SEQ ID NO: 156, and an amino acid sequence of amino acids 20 to 750 of the amino acid sequence as shown in SEQ ID NO: 157.~~

[40] ~~The molecule according to any one of Claims 24 to 39, wherein the second polypeptide comprises an amino acid sequence of amino acids 20 to 246 of the amino acid sequence as shown in SEQ ID NO: 84.~~

[41] ~~The molecule according to any one of Claims 18 to 23 comprising a first polypeptide, a second polypeptide, and a third polypeptide, wherein~~

~~the first polypeptide comprises scFv that binds specifically to human HLA/NY-ESO, scFv that binds specifically to CD3, and an Fe region (i) in that order from the N terminus toward the C terminus,~~

~~the second polypeptide comprises an immunoglobulin heavy chain comprising an Fe region (ii), and~~

~~the third polypeptide comprises an immunoglobulin light chain; and~~

~~the second polypeptide is associated with the third polypeptide, and~~

~~the first polypeptide is associated with the second polypeptide in the Fe regions.~~

[42] ~~The molecule according to Claim 41, wherein the seFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 1, which is seFv.~~

[43] ~~The molecule according to Claim 41, wherein the seFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 2, which is seFv.~~

[44] ~~The molecule according to Claim 41, wherein the seFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 3, which is seFv.~~

[45] ~~The molecule according to Claim 41, wherein the seFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 4, which is seFv.~~

[46] ~~The molecule according to Claim 41, wherein the seFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 5, which is seFv.~~

[47] ~~The molecule according to any one of Claims 42 to 46, wherein the seFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 18, which is seFv.~~

[48] ~~The molecule according to any one of Claims 42 to 46, wherein the seFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 19, which is seFv.~~

[49] ~~The molecule according to any one of Claims 42 to 46, wherein the seFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 20 or 21, which is seFv.~~

[50] ~~The molecule according to any one of Claims 42 to 46, wherein the seFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 23, which is seFv.~~

[51] ~~The molecule according to any one of Claims 41 to 50, wherein the second polypeptide~~

~~comprises an amino acid sequence of amino acids 20 to 242 of the amino acid sequence as shown in SEQ ID NO: 99.~~

[52] ~~The molecule according to any one of Claims 41 to 51, wherein the third polypeptide comprises the amino acid sequence as shown in SEQ ID NO: 100.~~

[53] ~~The molecule according to any one of Claims 41 to 52, wherein the first polypeptide comprises an amino acid sequence selected from the group consisting of an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 85, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 87, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 88, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 89, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 90, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 91, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 92, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 93, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 94, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 95, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 96, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 86, an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 149, and an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO: 150.~~

[54] ~~The molecule according to any one of Claims 41 to 53, wherein the first polypeptide consists of an amino acid sequence selected from the group consisting of an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 85, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 87, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 88, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 89, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 90, an amino acid sequence of amino acids 20 to 745~~

~~of the amino acid sequence as shown in SEQ ID NO: 91, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 92, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 93, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 94, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 95, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 96, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 86, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 149, and an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 150.~~

[55] ~~The molecule according to any one of Claims 18 to 23 comprising a first polypeptide that comprises scFv that binds specifically to human HLA/NY-ESO, a heavy chain variable region and constant region CH1 of the antibody that binds specifically to CD3, and an immunoglobulin Fe region (i) in that order from the N terminus toward the C terminus, a second polypeptide that comprises a hinge region and an Fe region (ii) of the immunoglobulin, and a third polypeptide that comprises an antibody light chain consisting of a variable region and a constant region, wherein the first polypeptide is associated with the second polypeptide at the Fe region (i) and the Fe region (ii), and the first polypeptide is associated with the third polypeptide in the heavy chain variable region and the constant region CH1 of the antibody.~~

[56] ~~The molecule according to Claim 55, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 1, which is scFv.~~

[57] ~~The molecule according to Claim 55, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 2, which is scFv.~~

[58] ~~The molecule according to Claim 55, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 3, which is scFv.~~

[59] ~~The molecule according to Claim 55, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding~~

fragment thereof according to Claim 4, which is scFv.

[60] The molecule according to Claim 55, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 5, which is scFv.

[61] The molecule according to any one of Claims 18 to 21, wherein the antibody that binds specifically to CD3 or the binding fragment thereof is Fab.

[62] The molecule according to any one of Claims 56 to 61, wherein the Fab that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 18, which is Fab.

[63] The molecule according to any one of Claims 56 to 61, wherein the Fab that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 19, which is Fab.

[64] The molecule according to any one of Claims 56 to 61, wherein the Fab that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 20 or 21, which is Fab.

[65] The molecule according to any one of Claims 55 to 64, wherein the first polypeptide comprises an amino acid sequence of amino acids 21 to 394 of the amino acid sequence as shown in SEQ ID NO: 160.

[66] The molecule according to any one of Claims 55 to 65, wherein the first polypeptide comprises the amino acid sequence according to any one of (i) to (iii) below:

(i) an amino acid sequence of amino acids 20 to 724 of the amino acid sequence as shown in SEQ ID NO: 160;

(ii) an amino acid sequence of amino acids 20 to 719 of the amino acid sequence as shown in SEQ ID NO: 197; and

(iii) an amino acid sequence of amino acids 20 to 719 of the amino acid sequence as shown in SEQ ID NO: 198.

[67] The molecule according to any one of Claims 55 to 66, wherein the second polypeptide comprises an amino acid sequence of amino acids 20 to 246 of the amino acid sequence as shown in SEQ ID NO: 84.

[68] The molecule according to any one of Claims 56 to 67, wherein the third polypeptide

~~comprises an amino acid sequence of amino acids 21 to 127 of the amino acid sequence as shown in SEQ ID NO: 161.~~

[69] ~~The molecule according to any one of Claims 56 to 68, wherein the third polypeptide comprises an amino acid sequence of amino acids 21 to 233 of the amino acid sequence as shown in SEQ ID NO: 161.~~

[70] ~~The molecule according to any one of Claims 15 to 69, wherein 1 or 2 amino acids are deleted from the carboxyl terminus of the amino acid sequence of at least one polypeptide included in the molecule.~~

[71] ~~A polynucleotide comprising a nucleotide sequence encoding an amino acid sequence included in the molecule according to any one of Claims 15 to 70.~~

[72] ~~A vector comprising the polynucleotide according to Claim 71.~~

[73] ~~A host cell comprising the polynucleotide according to Claim 71 or the vector according to Claim 72.~~

[74] ~~A method for producing a molecule that binds specifically to human HLA/NY-ESO and human CD3 comprising: (i) a step of culturing the host cell according to Claim 73; and (ii) a step of purifying an antibody or a binding fragment thereof from the culture product obtained in the step (i).~~

[75] ~~A molecule that binds specifically to human HLA/NY-ESO and human CD3, which is obtained by the method according to Claim 74.~~

[76] ~~A pharmaceutical composition comprising, as an active ingredient, the molecule according to any one of Claims 15 to 70, the polynucleotide according to Claim 71, the vector according to Claim 72, or the host cell according to Claim 73.~~

[77] ~~The pharmaceutical composition according to Claim 14 or 76, which is an anti-cancer agent.~~

[78] ~~The pharmaceutical composition according to Claim 77, wherein cancer is one or more cancers selected from the group consisting of renal cancer, melanoma, squamous cell carcinoma, basal cell cancer, conjunctival cancer, oral cavity cancer, laryngeal cancer, pharyngeal cancer, thyroid gland cancer, lung cancer (non-small cell lung cancer (adenocarcinoma, epidermoid cancer, large cell cancer), and small cell lung cancer), breast cancer, esophageal cancer, gastric cancer, duodenal carcinoma, small bowel cancer, large bowel cancer, rectal cancer, appendiceal~~

~~cancer, anal cancer, liver cancer, gallbladder cancer, bile duct cancer, pancreatic cancer, adrenal cancer, bladder cancer, prostate cancer, uterine cancer, vaginal cancer, liposarcoma, angiosarcoma, chondrosarcoma, rhabdomyosarcoma, Ewing's sarcoma, osteosarcoma, undifferentiated pleomorphic sarcoma, myxofibrosarcoma, malignant peripheral nerve sheath tumor, retroperitoneal sarcoma, synovial sarcoma, uterine sarcoma, gastrointestinal stromal tumor, leiomyosarcoma, epithelioid sarcoma, B-cell lymphoma, T/NK-cell lymphoma, Hodgkin's lymphoma, myelogenous leukemia, lymphatic leukemia, myeloproliferative disorder, myelodysplastic syndrome, multiple myeloma, testicular carcinoma, and ovarian cancer.~~

[79] ~~The pharmaceutical composition according to any one of Claims 76 to 78, which is used in combination with another agent.~~

Claims

[1] An antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof comprising:

a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 53 and a light chain variable region consisting of an amino acid sequence of amino acids 156 to 266 of the amino acid sequence as shown in SEQ ID NO: 53, or

a heavy chain variable region consisting of an amino acid sequence of amino acids 21 to 140 of the amino acid sequence as shown in SEQ ID NO: 156 and a light chain variable region consisting of an amino acid sequence of amino acids 161 to 271 of the amino acid sequence as shown in SEQ ID NO: 156.

[2] The antibody or the binding fragment thereof according to Claim 1, which is scFv.

[3] The antibody or the binding fragment thereof according to Claim 2, which is scFv consisting of an amino acid sequence of amino acids 21 to 266 of the amino acid sequence as shown in SEQ ID NO: 53,

or

scFv consisting of an amino acid sequence of amino acids 21 to 271 of the amino acid sequence as shown in SEQ ID NO: 156.

[4] A polynucleotide encoding the antibody or the binding fragment thereof according to any one of Claims 1 to 3.

[5] A vector comprising the polynucleotide according to Claim 4.

[6] A host cell comprising the polynucleotide according to Claim 4 or the vector according to Claim 5.

[7] A method for producing an antibody that binds specifically to human HLA/NY-ESO or a binding fragment thereof comprising: (i) a step of culturing the host cell according to Claim 6; and (ii) a step of purifying an antibody or a binding fragment thereof from the culture product obtained in step (i).

[8] An antibody that binds specifically to human HLA/NY-ESO or a binding fragment thereof, which is obtained by the method according to Claim 7.

[9] An antibody that has the properties (i) or (ii) below and binds to HLA-A2/NY-ESO or a binding fragment thereof:

(i) binding to a site on HLA-A2/NY-ESO recognized by the antibody or the binding fragment thereof according to Claim 3; or

(ii) binding to human HLA-A2/NY-ESO competitively with the antibody or the binding fragment thereof according to Claim 3.

[10] A pharmaceutical composition comprising, as an active ingredient, the antibody or the binding fragment thereof according to any one of Claims 1 to 3, 8, and 9, the polynucleotide according to Claim 4, the vector according to Claim 5, or the cell according to Claim 6.

[11] A molecule that binds specifically to human HLA/NY-ESO comprising the antibody or the binding fragment thereof according to any one of Claims 1 to 3, 8, and 9.

[12] The molecule according to Claim 11, which is a multispecific antibody.

[13] The molecule according to Claim 11, which is a bispecific antibody.

[14] The molecule according to any one of Claims 11 to 13, which comprises an antibody that binds specifically to CD3 or a binding fragment thereof.

[15] The molecule according to Claim 14, wherein the antibody that binds specifically to CD3 or the binding fragment thereof comprises:

(CCH1) a heavy chain CDRH1 consisting of the amino acid sequence as shown in SEQ ID NO: 141;

(CCH2) a heavy chain CDRH2 consisting of the amino acid sequence as shown in SEQ ID NO: 142 or a heavy chain CDRH2 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 142 in which amino acid 3 is N or S;

(CCH3) a heavy chain CDRH3 consisting of the amino acid sequence as shown in SEQ ID NO: 143;

(CCL1) a light chain CDRL1 consisting of the amino acid sequence as shown in SEQ ID NO: 144;

(CCL2) a light chain CDRL2 consisting of the amino acid sequence as shown in SEQ ID NO: 145 or a light chain CDRL2 consisting of an amino acid sequence derived from the amino acid sequence as shown in SEQ ID NO: 145 in which amino acid 2 is N; and

(CCL3) a light chain CDRL3 consisting of the amino acid sequence as shown in SEQ

ID NO: 146.

[16] The molecule according to Claim 15, wherein the antibody that binds specifically to CD3 or the binding fragment thereof comprises:

(CH1) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 136,

(CH2) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 137,

(CH3) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 147,

(CH4) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 138,

(CH5) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 139,

(CH6) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 140,

(CH7) a heavy chain variable region consisting of an amino acid sequence of amino acids 272 to 389 of the amino acid sequence as shown in SEQ ID NO: 155,

(CH8) a heavy chain variable region consisting of an amino acid sequence of amino acids 277 to 394 of the amino acid sequence as shown in SEQ ID NO: 156; or

(CH9) a heavy chain variable region consisting of an amino acid sequence of amino acids 277 to 394 of the amino acid sequence as shown in SEQ ID NO: 157; and

(CL1) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 136,

(CL2) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 241 of the amino acid sequence as shown in SEQ ID NO: 137,

(CL3) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 147,

(CL4) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 241 of the amino acid sequence as shown in SEQ ID NO: 138,

(CL5) a light chain variable region consisting of an amino acid sequence of amino

acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 139.

(CL6) a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 140.

(CL7) a light chain variable region consisting of an amino acid sequence of amino acids 405 to 511 of the amino acid sequence as shown in SEQ ID NO: 155.

(CL8) a light chain variable region consisting of an amino acid sequence of amino acids 410 to 516 of the amino acid sequence as shown in SEQ ID NO: 156, or

(CL9) a light chain variable region consisting of an amino acid sequence of amino acids 410 to 516 of the amino acid sequence as shown in SEQ ID NO: 157.

[17] The molecule according to Claim 16, wherein the antibody that binds specifically to CD3 or the binding fragment thereof comprises:

(CH1CL1) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 136 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 136;

(CH2CL2) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 137 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 241 of the amino acid sequence as shown in SEQ ID NO: 137;

(CH3CL3) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 147 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 147;

(CH4CL4) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 138 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 241 of the amino acid sequence as shown in SEQ ID NO: 138;

(CH5CL5) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 139 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino

acid sequence as shown in SEQ ID NO: 139;

(CH6CL6) a heavy chain variable region consisting of an amino acid sequence of amino acids 2 to 119 of the amino acid sequence as shown in SEQ ID NO: 140 and a light chain variable region consisting of an amino acid sequence of amino acids 135 to 243 of the amino acid sequence as shown in SEQ ID NO: 140;

(CH7CL7) a heavy chain variable region consisting of an amino acid sequence of amino acids 272 to 389 of the amino acid sequence as shown in SEQ ID NO: 155 and a light chain variable region consisting of an amino acid sequence of amino acids 405 to 511 of the amino acid sequence as shown in SEQ ID NO: 155;

(CH8CL8) a heavy chain variable region consisting of an amino acid sequence of amino acids 277 to 394 of the amino acid sequence as shown in SEQ ID NO: 156 and a light chain variable region consisting of an amino acid sequence of amino acids 410 to 516 of the amino acid sequence as shown in SEQ ID NO: 156; or

(CH9CL9) a heavy chain variable region consisting of an amino acid sequence of amino acids 277 to 394 of the amino acid sequence as shown in SEQ ID NO: 157 and a light chain variable region consisting of an amino acid sequence of amino acids 410 to 516 of the amino acid sequence as shown in SEQ ID NO: 157.

[18] The molecule according to any one of Claims 14 to 17, wherein the antibody that binds specifically to CD3 or the binding fragment thereof is scFv.

[19] The molecule according to Claim 18, wherein scFv comprises:

(CS1) scFv consisting of an amino acid sequence of amino acids 2 to 243 of the amino acid sequence as shown in SEQ ID NO: 136;

(CS2) scFv consisting of an amino acid sequence of amino acids 2 to 241 of the amino acid sequence as shown in SEQ ID NO: 137;

(CS3) scFv consisting of an amino acid sequence of amino acids 2 to 243 of the amino acid sequence as shown in SEQ ID NO: 147;

(CS4) scFv consisting of an amino acid sequence of amino acids 2 to 241 of the amino acid sequence as shown in SEQ ID NO: 138;

(CS5) scFv consisting of an amino acid sequence of amino acids 2 to 243 of the amino acid sequence as shown in SEQ ID NO: 139;

(CS6) scFv consisting of an amino acid sequence of amino acids 2 to 243 of the amino acid sequence as shown in SEQ ID NO: 140;

(CS7) scFv consisting of an amino acid sequence of amino acids 272 to 511 of the amino acid sequence as shown in SEQ ID NO: 155;

(CS8) scFv consisting of an amino acid sequence of amino acids 277 to 516 of the amino acid sequence as shown in SEQ ID NO: 156; or

(CS9) scFv consisting of an amino acid sequence of amino acids 277 to 516 of the amino acid sequence as shown in SEQ ID NO: 157.

[20] The molecule according to any one of Claims 14 to 19 comprising: a first polypeptide comprising scFv that binds specifically to human HLA/NY-ESO, scFv that binds specifically to CD3, and an Fc region (i) in that order from the N terminus toward the C terminus; and a second polypeptide comprising an Fc region (ii), wherein the first polypeptide is associated with the second polypeptide at the Fc region (i) and the Fc region (ii).

[21] The molecule according to Claim 20, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 1, which is scFv.

[22] The molecule according to Claim 20, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 2, which is scFv.

[23] The molecule according to Claim 20, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 3, which is scFv.

[24] The molecule according to any one of Claims 20 to 23, wherein the scFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 15, which is scFv.

[25] The molecule according to any one of Claims 20 to 23, wherein the scFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 16, which is scFv.

[26] The molecule according to any one of Claims 20 to 23, wherein the scFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment

thereof according to Claim 17, which is scFv.

[27] The molecule according to any one of Claims 20 to 23, wherein the scFv that binds specifically to CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 18 or 19, which is scFv.

[28] The molecule according to any one of claims 20 to 27 comprising an amino acid sequence of amino acids 21 to 511 of the amino acid sequence as shown in SEQ ID NO:96.

[29] The molecule according to any one of Claims 20 to 27, which comprises an amino acid sequence selected from the group consisting of an amino acid sequence of amino acids 21 to 516 of the amino acid sequence as shown in SEQ ID NO: 156, and an amino acid sequence of amino acids 21 to 516 of the amino acid sequence as shown in SEQ ID NO: 157.

[30] The molecule according to any one of Claims 20 to 29, wherein the first polypeptide comprises an amino acid sequence of amino acids 529 to 745 of the amino acid sequence as shown in SEQ ID NO: 96.

[31] The molecule according to any one of Claims 20 to 29, wherein the first polypeptide comprises an amino acid sequence of amino acids 534 to 750 of the amino acid sequence as shown in SEQ ID NO: 156, or an amino acid sequence of amino acids 534 to 750 of the amino acid sequence as shown in SEQ ID NO: 157.

[32] The molecule according to Claim 28 or 30, wherein the first polypeptide consists of an amino acid sequence of an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 96.

[33] The molecule according to Claim 29 or 31, wherein the first polypeptide consists of an amino acid sequence of amino acids 20 to 750 of the amino acid sequence as shown in SEQ ID NO: 156, or an amino acid sequence of amino acids 20 to 750 of the amino acid sequence as shown in SEQ ID NO: 157.

[34] The molecule according to any one of Claims 20 to 33, wherein the second polypeptide comprises an amino acid sequence of amino acids 20 to 246 of the amino acid sequence as shown in SEQ ID NO: 84.

[35] The molecule according to any one of Claims 14 to 17 comprising a first polypeptide that comprises scFv that binds specifically to human HLA/NY-ESO, a heavy chain variable region and constant region CH1 of the antibody that binds specifically to CD3, and an

immunoglobulin Fc region (i) in that order from the N terminus toward the C terminus, a second polypeptide that comprises a hinge region and an Fc region (ii) of the immunoglobulin, and a third polypeptide that comprises an antibody light chain consisting of a variable region and a constant region, wherein the first polypeptide is associated with the second polypeptide at the Fc region (i) and the Fc region (ii), and the first polypeptide is associated with the third polypeptide in the heavy chain variable region and the constant region CH1 of the antibody.

[36] The molecule according to Claim 35, wherein the third polypeptide comprises an antibody light chain that binds specifically to the CD3, which consists of a variable region and constant region.

[37] The molecule according to Claim 35 or 36, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 1, which is scFv.

[38] The molecule according to Claim 35 or 36, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 2, which is scFv.

[39] The molecule according to Claim 35 or 36, wherein the scFv that binds specifically to human HLA/NY-ESO is the antibody that binds specifically to human HLA/NY-ESO or the binding fragment thereof according to Claim 3, which is scFv.

[40] The molecule according to any one of Claims 35 to 39, wherein the antibody that binds specifically to the CD3 or the binding fragment thereof is Fab.

[41] The molecule according to Claim 40, wherein the Fab that binds specifically to the CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 15, which is Fab.

[42] The molecule according to Claim 40, wherein the Fab that binds specifically to the CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 16, which is Fab.

[43] The molecule according to Claim 40, wherein the Fab that binds specifically to the CD3 is the antibody that binds specifically to CD3 or the binding fragment thereof according to Claim 17, which is Fab.

[44] The molecule according to any one of Claims 35 to 43, wherein the first polypeptide

comprises an amino acid sequence of amino acids 21 to 394 of the amino acid sequence as shown in SEQ ID NO: 160.

[45] The molecule according to any one of Claims 35 to 44, wherein the first polypeptide comprises the amino acid sequence according to (i) or (ii) below:

(i) an amino acid sequence of amino acids 20 to 724 of the amino acid sequence as shown in SEQ ID NO: 160; and

(ii) an amino acid sequence of amino acids 20 to 719 of the amino acid sequence as shown in SEQ ID NO: 197.

[46] The molecule according to any one of Claims 35 to 45, wherein the second polypeptide comprises an amino acid sequence of amino acids 20 to 246 of the amino acid sequence as shown in SEQ ID NO: 84.

[47] The molecule according to any one of Claims 35 to 46, wherein the third polypeptide comprises an amino acid sequence of amino acids 21 to 127 of the amino acid sequence as shown in SEQ ID NO: 161.

[48] The molecule according to any one of Claims 35 to 47, wherein the third polypeptide comprises an amino acid sequence of amino acids 21 to 233 of the amino acid sequence as shown in SEQ ID NO: 161.

[49] The molecule according to any one of Claims 11 to 48, wherein 1 or 2 amino acids are deleted from the carboxyl terminus of the amino acid sequence of at least one polypeptide included in the molecule.

[50] A polynucleotide comprising a nucleotide sequence encoding an amino acid sequence included in the molecule according to any one of Claims 11 to 49.

[51] A vector comprising the polynucleotide according to Claim 50.

[52] A host cell comprising the polynucleotide according to Claim 50 or the vector according to Claim 51.

[53] A method for producing a molecule that binds specifically to human HLA/NY-ESO and human CD3 comprising: (i) a step of culturing the host cell according to Claim 52; and (ii) a step of purifying an antibody or a binding fragment thereof from the culture product obtained in the step (i).

[54] A molecule that binds specifically to human HLA/NY-ESO and human CD3, which

is obtained by the method according to Claim 53.

[55] A pharmaceutical composition comprising, as an active ingredient, the molecule according to any one of Claims 11 to 49 and 54, the polynucleotide according to Claim 50, the vector according to Claim 51, or the host cell according to Claim 52.

[56] The pharmaceutical composition according to Claim 10 or 55, which is an anti-cancer agent.

[57] The pharmaceutical composition according to Claim 56, wherein cancer is one or more cancers selected from the group consisting of renal cancer, melanoma, squamous cell carcinoma, basal cell cancer, conjunctival cancer, oral cavity cancer, laryngeal cancer, pharyngeal cancer, thyroid gland cancer, lung cancer (non-small cell lung cancer (adenocarcinoma, epidermoid cancer, large cell cancer), and small cell lung cancer), breast cancer, esophageal cancer, gastric cancer, duodenal carcinoma, small bowel cancer, large bowel cancer, rectal cancer, appendiceal cancer, anal cancer, liver cancer, gallbladder cancer, bile duct cancer, pancreatic cancer, adrenal cancer, bladder cancer, prostate cancer, uterine cancer, vaginal cancer, liposarcoma, angiosarcoma, chondrosarcoma, rhabdomyosarcoma, Ewing's sarcoma, osteosarcoma, undifferentiated pleomorphic sarcoma, myxofibrosarcoma, malignant peripheral nerve sheath tumor, retroperitoneal sarcoma, synovial sarcoma, uterine sarcoma, gastrointestinal stromal tumor, leiomyosarcoma, epithelioid sarcoma, B cell lymphoma, T/NK-cell lymphoma, Hodgkin's lymphoma, myelogenic leukemia, lymphatic leukemia, myeloproliferative disorder, myelodysplastic syndrome, multiple myeloma, testicular carcinoma, and ovarian cancer.

[58] The pharmaceutical composition according to any one of claims 10 and 55 to 57, which is used in combination with another agent.

[59] A multispecific molecule that binds specifically to human HLA/NY-ESO and human CD3 comprising a first polypeptide comprising scFv that binds specifically to human HLA/NY-ESO, scFv that binds specifically to CD3, and the Fc region (i) in that order from the N terminus toward the C terminus; and a second polypeptide comprising the Fc region (ii), wherein the first polypeptide is associated with the second polypeptide in the Fc region (i) and the Fc region (ii), and the first polypeptide comprises an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 96, an amino acid sequence of amino acids 20 to 745 of the amino acid sequence as shown in SEQ ID NO: 155, an amino acid sequence of

amino acids 20 to 750 of the amino acid sequence as shown in SEQ ID NO: 156, or an amino acid sequence of amino acids 20 to 750 of the amino acid sequence as shown in SEQ ID NO: 157, or an amino acid sequence thereof wherein 1 or 2 amino acids are deleted from the carboxyl terminus of the amino acid sequence, and

the second polypeptide comprises an amino acid sequence of amino acids 20 to 246 of the amino acid sequence as shown in SEQ ID NO:84 or an amino acid sequence thereof wherein 1 or 2 amino acids are deleted from the carboxyl terminus of the amino acid sequence.

[60] A multispecific molecule that binds specifically to human HLA/NY-ESO and human CD3 comprising the first polypeptide that comprises scFv that binds specifically to human HLA/NY-ESO, heavy chain variable region and constant region CH1 of the antibody that binds specifically to CD3, and the immunoglobulin Fc region (i) in that order from the N terminus toward the C terminus, the second polypeptide that comprises the hinge region and the Fc region (ii) of the immunoglobulin, and the third polypeptide that comprises an antibody light chain consisting of a variable region and a constant region, wherein the first polypeptide is associated with the second polypeptide in the Fc region (i) and in the Fc region (ii), and the first polypeptide is associated with the third polypeptide in the heavy chain variable region and the constant region CH1 of the antibody, and

the first polypeptide comprises an amino acid sequence of amino acids 20 to 724 of the amino acid sequence as shown in SEQ ID NO: 160 or an amino acid sequence of amino acids 20 to 719 of the amino acid sequence as shown in SEQ ID NO: 197, or an amino acid sequence thereof wherein 1 or 2 amino acids are deleted from the carboxyl terminus of the amino acid sequence, and

the second polypeptide comprises comprises an amino acid sequence of amino acids 20 to 246 of the amino acid sequence as shown in SEQ ID NO:84, and

the third polypeptide comprises an amino acid sequence of amino acids 21 to 127 of the amino acid sequence as shown in SEQ ID NO:161, or an amino acid sequence of amino acids 21 to 233 of the amino acid sequence as shown in SEQ ID NO:161.

[61] A polynucleotide comprising a nucleotide sequence encoding an amino acid sequence included in the molecule according to any one of Claims 59 or 60.

[62] A vector comprising the polynucleotide according to Claim 61.

[63] A host cell comprising the polynucleotide according to Claim 61 or the vector according to Claim 62.

[64] A method for producing a multispecific molecule that binds specifically to human HLA/NY-ESO and human CD3 comprising: (i) a step of culturing the host cell according to Claim 63; and (ii) a step of purifying an antibody or a binding fragment thereof from the culture product obtained in the step (i).

[65] A multispecific molecule that binds specifically to human HLA/NY-ESO and human CD3, which is obtained by the method according to Claim 64.

[66] A pharmaceutical composition comprising, as an active ingredient, the molecule according to any one of Claims 59, 60 or 65, the polynucleotide according to Claim 61, the vector according to Claim 62, or the host cell according to Claim 63.

[67] The pharmaceutical composition according to Claim 66, which is an anti-cancer agent.

[68] The pharmaceutical composition according to Claim 67, wherein cancer is one or more cancers selected from the group consisting of renal cancer, melanoma, squamous cell carcinoma, basal cell cancer, conjunctival cancer, oral cavity cancer, laryngeal cancer, pharyngeal cancer, thyroid gland cancer, lung cancer (non-small cell lung cancer (adenocarcinoma, epidermoid cancer, large cell cancer), and small cell lung cancer), breast cancer, esophageal cancer, gastric cancer, duodenal carcinoma, small bowel cancer, large bowel cancer, rectal cancer, appendiceal cancer, anal cancer, liver cancer, gallbladder cancer, bile duct cancer, pancreatic cancer, adrenal cancer, bladder cancer, prostate cancer, uterine cancer, vaginal cancer, liposarcoma, angiosarcoma, chondrosarcoma, rhabdomyosarcoma, Ewing's sarcoma, osteosarcoma, undifferentiated pleomorphic sarcoma, myxofibrosarcoma, malignant peripheral nerve sheath tumor, retroperitoneal sarcoma, synovial sarcoma, uterine sarcoma, gastrointestinal stromal tumor, leiomyosarcoma, epithelioid sarcoma, B cell lymphoma, T/NK-cell lymphoma, Hodgkin's lymphoma, myelogenic leukemia, lymphatic leukemia, myeloproliferative disorder, myelodysplastic syndrome, multiple myeloma, testicular carcinoma, and ovarian cancer.

[69] The pharmaceutical composition according to any one of claims 66 to 68, which is used in combination with another agent.

[70] The pharmaceutical composition according to any one of claims 66 to 69, which

comprises another agent.