WHAT IS CLAIMED IS:

1. A bispecific anti-HER2 antibody comprising a first immunoglobulin antigen-binding domain and a second immunoglobulin antigen-binding domain, wherein (i) the first and second immunoglobulin antigen-binding domains specifically bind to distinct HER2 antibody binding sites, (ii) the first immunoglobulin antigen-binding domain binds to a first HER2 antibody binding site which comprises an epitope within domain II of HER2, and (iii) the first HER2 antibody binding site is distinct from the antibody binding site of pertuzumab;

and wherein the first immunoglobulin antigen-binding domain comprises a heavy chain (HC) variable region (VH) and a light chain (LC) variable region (VL) comprising:

(a) a variable heavy chain CDR-1 (VH-CDR1) identical to SEQ ID NO: 1;

(b) a variable heavy chain CDR-2 (VH-CDR2) identical to SEQ ID NO: 2;

(c) a variable heavy chain CDR-3 (VH-CDR3) identical to SEQ ID NO: 3;

(d) a variable light chain CDR-1 (VL-CDR1) identical to SEQ ID NO: 4;

(e) a variable light chain CDR-2 (VL-CDR2) identical to SEQ ID NO: 5; and

(f) a variable light chain CDR-3 (VL-CDR3) identical to SEQ ID NO: 6.

2. A bispecific anti-HER2 antibody comprising a first immunoglobulin antigen binding-domain and a second immunoglobulin antigen-binding domain, wherein the first immunoglobulin antigen-binding domain comprises a VH and a VL, wherein

(a) the VH comprises the amino acids of SEQ ID NO:15;

(b) the VL comprises the amino acids of SEQ ID NO:16;

and wherein the first and second immunoglobulin antigen-binding domains specifically bind to distinct HER2 epitopes.

3. The bispecific anti-HER2 antibody according to claim 1, wherein the first immunoglobulin antigen binding domain and/or the second immunoglobulin antigen-binding domain comprises or consists of (a) a VH further comprising a HC constant region or a fragment

thereof and a VL further comprising a LC constant region or a fragment thereof; (b) a single chain Fv ("scFv"); (c) a diabody; (d) a minibody; (e) an F(ab')2; or (f) an F(ab).

4. The bispecific anti-HER2 antibody according to claim 3, wherein (a) the HC constant region or fragment thereof is an IgG constant region; and/or (b) the LC constant region is a kappa constant region or a lambda constant region.

5. The bispecific anti-HER2 antibody according to claim 1, wherein:

(a) the second immunoglobulin antigen-binding domain specifically binds to the same HER2 epitope as the trastuzumab antibody;

(b) the second immunoglobulin antigen-binding domain competitively inhibits HER2 binding by the trastuzumab antibody; or

(c) the second immunoglobulin antigen-binding domain comprises at least one, at least two, at least three, at least four, at least five, or at least six complementarity determining regions (CDRs) comprising the amino acids of any one of SEQ ID NOs: 54 to 59.

6. The bispecific anti-HER2 antibody according to claim 5, wherein the second immunoglobulin antigen-binding domain is an scFv comprising:

(i) a VH-CDR1 comprising the amino acids of SEQ ID NO:54;

(ii) a VH-CDR2 comprising the amino acids of SEQ ID NO:55;

(iii) a VH-CDR3 comprising the amino acids of SEQ ID NO:56;

(iv) a VL-CDR1 comprising the amino acids of SEQ ID NO:57;

(v) a VL-CDR2 comprising the amino acids of SEQ ID NO:58; and

(vi) a VL-CDR3 comprising the amino acids of SEQ ID NO:59.

7. The bispecific anti-HER2 antibody according to claim 6, wherein

(a) the second immunoglobulin antigen-binding domain is covalently linked to the carboxy-terminus of the HC of the first immunoglobulin antigen-binding domain;

(b) the second immunoglobulin antigen-binding domain is covalently linked to the amino-terminus of the HC of the first immunoglobulin antigen-binding domain; or,

(c) the second immunoglobulin antigen binding domain is covalently intercalated in the polypeptide chain of the HC of the first immunoglobulin antigen-binding domain.

8. The bispecific anti-HER2 antibody according to claim 1, wherein the heavy chain comprises a constant region comprising an Fc domain and wherein the Fc domain comprises at least one mutation capable of reducing or enhancing the ADCC activity of the bispecific antibody.

9. A bispecific anti-HER2 antibody comprising a first and a second polypeptide chain associated with each other, wherein the first polypeptide chain is selected from:

(1) $[TZ_S]$-$[L_1]$-$[_BVH]$-$[_BCH]$-$[Fc_x]$

(2) $[_BVH]$-$[_BCH]$-$[Fc_x]$-$[L_2]$-$[TZ_S]$

(3) $[_BVH]$-$[_BCH]$-$[L_3]$-$[TZ_S]$-$[L_4]$-$[Fc_x]$

wherein

TZs is an scFv that binds the same epitope as trastuzumab;

L_1, L_2, L_3, and L_4 are peptide linkers;

Fc_x is an Fc domain;

$_BVH$ and $_BCH$ are the VH and CH1 regions, respectively, of an antibody capable of binding to a HER2 epitope distinct from the epitope recognized by the trastuzumab antibody;

and wherein the second chain comprises $[_BVL]$-[CL] wherein $_BVL$ is the VL region of an antibody capable of binding to a HER2 epitope distinct from the epitope recognized by the trastuzumab antibody, and CL is a IgG light chain constant region selected from the group consisting of a human kappa constant region and a human lambda constant region;

and wherein the $_BVL$ comprises

(i) a variable light chain CDR-1 (VL-CDR1) identical to SEQ ID NO: 4;

(ii) a variable light chain CDR-2 (VL-CDR2) identical to SEQ ID NO: 5; and,

(iii) a variable light chain CDR-3 (VL-CDR3) identical to SEQ ID NO: 6;

and wherein [TZ_S] comprises

(i) a VH-CDR1 comprising the amino acids of SEQ ID NO:54;

(ii) a VH-CDR2 comprising the amino acids of SEQ ID NO:55;

(iii) a VH-CDR3 comprising the amino acids of SEQ ID NO:56;

(iv) a VL-CDR1 comprising the amino acids of SEQ ID NO:57;

(v) a VL-CDR2 comprising the amino acids of SEQ ID NO:58; and

(vi) a VL-CDR3 comprising the amino acids of SEQ ID NO:59;

and wherein the [Fcx] comprises

(i) at least one amino acid substitution introducing a derivatizable group; and/or,

(ii) at least one mutation capable of enhancing the ADCC activity of the bispecific antibody;

and wherein [$_B$VH] comprises

(i) a variable heavy chain CDR-1 (VH-CDR1) identical to SEQ ID NO: 1;

(ii) a variable heavy chain CDR-2 (VH-CDR2) identical to SEQ ID NO: 2; and

(iii) a variable heavy chain CDR-3 (VH-CDR3) identical to SEQ ID NO: 3.

10. An antibody-drug conjugate (ADC) comprising the bispecific HER2 antibody according to claim 1 and least one, two, three, or four therapeutic moieties, and optionally comprising at least one spacer, wherein a therapeutic moiety is chemically conjugated to the side chain of an amino acid at a specific position in the Fc region of the bispecific antibody and wherein the specific position is selected from the group consisting of 239, 248, 254, 258, 273, 279, 282, 284, 286, 287, 289, 297, 298, 312, 324, 326, 330, 335, 337, 339, 350, 355, 356, 359, 360, 361, 375, 383, 384, 389, 398, 400, 413, 415, 418, 422, 435, 440, 441, 442, 443, 446, an insertion between positions 239 and 240, and combinations thereof, wherein the amino acid position numbering is according to the EU index as set forth in Kabat.

11. The ADC according to claim 10, wherein the specific positions are 239, 442, or both, wherein the amino acid position numbering is according to the EU index as set forth in Kabat.

12. An ADC comprising the bispecific HER2 antibody according to claim 1, wherein said antibody comprises:

(i) a first polypeptide chain comprising the amino acids of SEQ ID NO: 32 and a second polypeptide chain comprising the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises a therapeutic moiety covalently linked to a cysteine amino acid at position 239, wherein the amino acid position numbering is according to the EU index as set forth in Kabat;

(ii) a first polypeptide chain comprising the amino acids of SEQ ID NO:33 and a second polypeptide chain comprising the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises two therapeutic moieties covalently linked to cysteine amino acids respectively located at positions 239 and 442, wherein the amino acid position numbering is according to the EU index as set forth in Kabat;

(iii) a first polypeptide chain comprising the amino acids of SEQ ID NO:36 and a second polypeptide chain comprising the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises a therapeutic moiety covalently linked to a cysteine amino acid at position 239, wherein the amino acid position numbering is according to the EU index as set forth in Kabat;

(iv) a first polypeptide chain comprising the amino acids of SEQ ID NO:37 and a second polypeptide chain comprising the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises two therapeutic moieties covalently linked to cysteine amino acids respectively located at positions 239 and 442, wherein the amino acid position numbering is according to the EU index as set forth in Kabat;

(v) a first polypeptide chain comprising the amino acids of SEQ ID NO:40 and a second polypeptide chain comprising the amino acids of SEQ ID NO:42, wherein

the first polypeptide chain comprises a therapeutic moiety covalently linked to a cysteine amino acid at position 239, wherein the amino acid position numbering is according to the EU index as set forth in Kabat; or,

(vi) a first polypeptide chain comprising the amino acids of SEQ ID NO:41 and a second polypeptide chain comprising the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises two therapeutic moieties covalently linked to cysteine amino acids respectively located at positions 239 and 442, wherein the amino acid position numbering is according to the EU index as set forth in Kabat.

(vii) a first polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:32 and a second polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises a therapeutic moiety covalently linked to a cysteine amino acid inserted between positions 239 and 240, wherein the amino acid position numbering is according to the EU index as set forth in Kabat;

(viii) a first polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:71 and a second polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises two therapeutic moieties covalently linked to a cysteine amino inserted between positions 239 and 240 and a cysteine amino acid located at position 442, wherein the amino acid position numbering is according to the EU index as set forth in Kabat;

(ix) a first polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:74 and a second polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises a therapeutic moiety covalently linked to a cysteine amino acid inserted between positions 239 and 240, wherein the amino acid position numbering is according to the EU index as set forth in Kabat;

(x) a first polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:76 and a second polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises two therapeutic moieties covalently linked to a cysteine amino inserted between positions 239 and 240 and a cysteine amino acid located at position 442, wherein the amino acid position numbering is according to the EU index as set forth in Kabat;

(xi) a first polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:79 and a second polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises a therapeutic moiety covalently linked to a cysteine amino acid inserted between positions 239 and 240, wherein the amino acid position numbering is according to the EU index as set forth in Kabat; or,

(xii) a first polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:81 and a second polypeptide chain comprising or consisting of the amino acids of SEQ ID NO:42, wherein the first polypeptide chain comprises two therapeutic moieties covalently linked to a cysteine amino inserted between positions 239 and 240 and a cysteine amino acid located at position 442, wherein the amino acid position numbering is according to the EU index as set forth in Kabat.

13. The ADC according to claim 10, wherein the therapeutic moiety comprises a cytotoxin, a radioisotope, an immunomodulator, a cytokine, a lymphokine, a chemokine, a growth factor, a tumor necrosis factor, a hormone, a hormone antagonist, an enzyme, an oligonucleotide, a DNA, an RNA, an siRNA, an RNAi, a microRNA, a photoactive therapeutic agent, an anti-angiogenic agent, a pro-apoptotic agent, a peptide, a lipid, a carbohydrate, a chelating agent, or combinations thereof.

14. The ADC according to claim 13, wherein the cytotoxin is a tubulysin, an auristatin, a maytansinoid or a pyrrolobenzodiazepine (PBD).

15. A pharmaceutical composition comprising an ADC according to claim 10, and a pharmaceutically acceptable carrier.

16. Use of the bispecific HER2 antibody according to any one of claims 1 to 9, the ADC according to any one of claims 10 to 14, or the pharmaceutical composition according to claim 15 in the manufacture of a medicament for use in the treatment of a HER2-expressing cancer.

17. The use according to claim 16, wherein the cancer is a low HER2-expressing cancer.

18. Use of the bispecific HER2 antibody according to any one of claims 1 to 9, the ADC according to any one of claims 10 to 14, or the pharmaceutical composition according to claim 15 in the manufacture of a medicament for the use in treatment of cancer resistant to a HER2-targeting therapeutic agent.