CLAIMS

1. An antibody that binds to Claudin 6 (CLDN6) or antigen-binding fragment thereof wherein the antibody or antigen-binding fragment is selected from a group consisting of

(a) an antibody that binds CLDN6 or antigen-binding fragment thereof comprising:

(i) an HC CDR1 comprising the amino acid sequence of FTFSXYX (SEQ ID NO: 455), wherein X at position 5 is N and X at position 7 is W;

(ii) an HC CDR2 comprising the amino acid sequence of IRLKXDXYAT (SEQ ID NO: 456), wherein X at position 5 is S and X at position 7 is N;

(iii) an HC CDR3 comprising the amino acid sequence of XDGPPSGX (SEQ ID NO: 457), wherein X at position 1 is N and X at position 8 is S;

(iv) an LC CDR1 comprising the amino acid sequence of EXIYSY (SEQ ID NO: 476), wherein X is N;

(v) an LC CDR2 comprising the amino acid sequence of XAK (SEQ ID NO: 477), wherein X at position 1 is N; and

(vi) an LC CDR3 comprising the amino acid sequence of QXHYXVPWT (SEQ ID NO: 454), wherein X at position 2 is H and X at position 5 is T; and

(b) an antibody that binds CLDN6 or antigen-binding fragment thereof comprising the heavy chain (HC) CDR1-3 amino acid sequences of SEQ ID NOs: 23, 24, and 25, and the light chain (LC) CDR1-3 amino acid sequences of SEQ ID NOs: 20, 21, and 22.

2. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody is

(i) a monoclonal antibody, and/or

(ii) a human, chimeric, or humanized antibody.

3. The antibody or antigen-binding fragment thereof according to any of the preceding claims, wherein the antibody is a humanized antibody comprising the heavy chain variable domain sequence as provided in SEQ ID NO: 387 and light chain variable domain sequence as provided in SEQ ID NO: 389.

4. A pharmaceutical composition comprising:
   a) an antibody or antigen-binding fragment thereof according to any of the preceding claims;
   b) a conjugate comprising the antibody or antigen-binding fragment thereof of (a);
   c) a fusion protein comprising the antibody or antigen-binding fragment thereof of (a);
   d) a nucleic acid encoding the antibody or antigen-binding fragment thereof of (a);
   e) a vector comprising the nucleic acid of (d);
   f) a cell comprising the nucleic acid of (d) or the vector of (e); or
   g) a combination thereof;

   and a pharmaceutically acceptable carrier, diluent or excipient.

5. The antibody or antigen-binding fragment thereof according to any of claims 1 to 3 or the pharmaceutical composition according to claim 4 for use in treating cancer.

6. An *in vitro* method for detecting Claudin 6 (CLDN6) in a sample comprising (a) contacting the antibody or antigen-binding fragment thereof according to any of claims 1 to 3 with the sample, and (b) assaying for an immunocomplex comprising the antibody or antigen-binding fragment thereof bound to CLDN6.

7. The antibody or antigen-binding fragment thereof according to any of claims 1 to 3 or the pharmaceutical composition according to claim 4 for use in a method diagnosing *in vivo* a Claudin 6 (CLDN6)-positive cancer in a subject.

8. A method of producing the pharmaceutical composition of claim 4, comprising combining a pharmaceutically acceptable carrier, diluent, or excipient; and any one of items (a)-(g) of claim 4.

9. A nucleic acid comprising a nucleotide sequence encoding
i. an antibody or antigen-binding fragment thereof of any one of claims 1 to 3, or
ii. a fusion protein comprising the antigen-binding protein of any one of claims 1 to 3.

10. A vector comprising the nucleic acid of claim 9.

11. A host cell comprising the nucleic acid of claim 9 or the vector of claim 10.

12. A method of producing an antibody or antigen-binding fragment thereof or a fusion protein thereof that binds to a Claudin 6 (CLDN6) protein, comprising
i. culturing the host cell of claim 11 in a cell culture medium, and
ii. harvesting the antibody or antigen-binding fragment thereof or the fusion protein from the cell culture medium.