CLAIMS

1. An anti-CA XII antibody or an antigen-binding fragment thereof, binding to carbonic anhydrase 12 (CA XII),

wherein the epitope bound by the antibody

(a) consists of 7 to 14 consecutive amino acids from SEQ ID NO: 2 and comprises the amino acid sequence of SEQ ID NO: 1; or

(b) consists of 14 to 19 consecutive amino acids from SEQ ID NO: 4 and comprises the amino acid sequence of SEQ ID NO: 3.

2. The antibody or antigen-binding fragment according to claim 1, wherein the epitope bound by the antibody consists of the amino acid sequence of SEQ ID NO: 1, 2, 3 or 4.

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

(a) V_H-CDRs comprising the amino acid sequences of SEQ ID NOs: 6 to 8 and V_L-CDRs comprising the amino acid sequences of SEQ ID NOs: 9 to 11;

(b) a heavy chain variable region comprising an amino acid sequence of SEQ ID NO: 12 and a light chain variable region comprising an amino acid sequence of SEQ ID NO: 13; or

(c) V_H-CDRs comprising the amino acid sequences of SEQ ID NOs: 14 to 16 and V_L-CDRs comprising the amino acid sequences of SEQ ID NOs: 17 to 19, optionally wherein the antibody comprises a heavy chain variable region comprising an amino acid sequence of SEQ ID NO: 20 and a light chain variable region comprising an amino acid sequence of SEQ ID NO: 21.

4. The antibody or antigen-binding fragment according to claim 1 or claim 2, wherein the antibody comprises V_H-CDRs comprising the amino acid sequences of SEQ ID NOs: 14, 15 and 28 and V_L-CDRs comprising the amino acid sequences of SEQ ID NOs: 29, 30 and 31, optionally wherein

(a) the V_L-CDR1 comprises an amino acid sequence of SEQ ID NO: 32 or 33, or the V_L-CDR2 comprises an amino acid sequence selected from the group consisting of SEQ ID NOs: 34 to 42;

(b) the antibody further comprises a V_H-framework sequence comprising amino acid sequences of SEQ ID NOs: 43 to 46;

(c) the antibody further comprises a V_L-framework sequence comprising amino acid

sequences of SEQ ID NOs: 47, 48, 51 and 52, optionally wherein the antibody further comprises a V_L-framework sequences comprising an amino acid sequence of SEQ ID NO: 48 which comprise an amino acid sequence of SEQ ID NO: 49 or 50; or

(d) the antibody comprises a V_H-region amino acid sequence comprising an amino acid sequence of SEQ ID NO: 53, and a V_L-region amino acid sequence comprising an amino acid sequence selected from the group consisting of the sequences of SEQ ID NOs: 54 to 63.

5. An anti-CA XII antibody or an antigen-binding fragment thereof, comprising CDR-H1, CDR-H2, CDR-H3, CDR-L1, CDR-L2, and CDR-L3 of an anti-CA XII antibody produced from hydridoma deposited as an accession number KCLRF-BP-00279 or KCLRF-BP-00280.

6. The antibody or antigen-binding fragment according to claim 5, wherein the antibody comprises a heavy chain variable region and a light chain variable region of an anti-CA XII antibody produced from hydridoma deposited as an accession number KCLRF-BP-00279 or KCLRF-BP-00280.

7. The antibody or antigen-binding fragment according to any one of claim 1 to claim 6, wherein

(a) the anti-CA XII antibody is animal antibody, chimeric antibody or humanized antibody;

(b) the antibody has an agonist activity to CA XII; or

(c) the antigen-binding fragment is scFv, $(scFv)_2$, Fab, Fab' or $F(ab')_2$ of the anti- CA-XII antibody.

8. The antibody or antigen-binding fragment according to any one of claim 1 to claim 7, wherein the antibody or the antigen-binding fragment is coupled to a labeling agent, toxin, or anti-tumor agent, optionally wherein

(a) the labeling agent is selected from the group consisting of a radioisotope, a hapten, a fluorescent material, a chromogen, and a dye;

(b) the toxin is a radioisotope, a small molecule, a peptide or a protein;

(c) the antibody or antigen-binding fragment is coupled with a toxin to form a fusion protein; or

(d) the fucoses bound to the antibody or antigen-binding fragment are partly or completely removed.

9. A nucleic acid molecule encoding the antibody or antigen-binding fragment of the antibody that binds to carbonic anhydrase according to any one of claims 1 to 7.

10. A vector introduced by a nucleic acid molecule encoding the antibody or antigen-binding fragment of the antibody that binds to carbonic anhydrase according to any one of claims 1 to 7.

11. A host expressing the antibody or antigen-binding fragment of the antibody that binds to carbonic anhydrase according to any one of claims 1 to 7.

12. The host according to claim 11, wherein the host is a hybridoma cell, optionally wherein the host is a hybridoma cell deposited as an accession number of KCLRF-BP-00280 or KCLRF-BP-00279, and the hybridoma cell produces the antibody or antigen-binding fragment thereof that binds to carbonic anhydrase.

13. A pharmaceutical composition for alleviation or treatment of solid cancer, comprising the antibody or antigen-binding fragment of the antibody that binds to carbonic anhydrase according to any one of claims 1 to 7.

14. Use of the antibody or antigen-binding fragment according to any one of claims 1 to 7 in the manufacture of a medicament for alleviation or treatment of solid cancer.

15. The pharmaceutical composition according to claim 13 or the use of claim 14, wherein

(a) the solid cancer is breast cancer, lung cancer, colon cancer, stomach cancer, prostate cancer, or liver cancer, optionally wherein the solid cancer is a triple-negative breast cancer;

(b) the antibody or antigen-binding fragment is further coupled to a toxin;

(c) the pharmaceutical composition further comprises an anti-cancer chemical drug or other anti-cancer antibody, or wherein the antibody or antigen-binding fragment is to be administered with an anti-cancer chemical drug or other anti-cancer antibody; or

(d) the pharmaceutical composition, or the antibody or antigen-binding fragment, is to be administered with radiotherapy.

16. A composition for detecting a solid cancer, comprising the antibody or antigen-binding fragment of the antibody that binds to carbonic anhydrase according to any one of claims

1 to 7, wherein a sample is determined as the solid cancer if the sample shows a positive reaction to the antibody or antigen-binding fragment.

17. A method for detecting a solid cancer, the method comprising contacting a sample with the antibody or antigen-binding fragment according to any one of claims 1 to 7, wherein the sample is determined as the solid cancer if the sample shows a positive reaction to the antibody or antigen-binding fragment.

18. The composition for detecting a solid cancer according to claim 16 or method of claim 17, wherein

(a) the antibody or the antigen-binding fragment is coupled to a labeling agent;

(b) the solid cancer is breast cancer, lung cancer, colon cancer, stomach cancer, prostate cancer, or liver cancer; or

(c) the positive reaction is determined by detecting enzyme reaction, fluorescence, luminescence or radiation.