Claims

1. An antibody or antigen-binding fragment thereof specifically binding to CTLA4, wherein the antibody comprises a heavy chain variable region, wherein the heavy chain variable region comprises CDR1, CDR2 and CDR3, wherein the CDR1, CDR2 and CDR3 comprise an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to:
(1) SEQ ID NO: 1, SEQ ID NO: 2 and SEQ ID NO: 3, respectively;
(2) SEQ ID NO: 13, SEQ ID NO: 14 and SEQ ID NO: 15, respectively; or
(3) SEQ ID NO: 22, SEQ ID NO: 23 and SEQ ID NO: 24, respectively.

2. The antibody or antigen-binding fragment thereof according to claim 1, wherein the heavy chain variable region comprises CDR1, CDR2 and CDR3, wherein the CDR1 comprises or consists of the sequence as set forth in SEQ ID NO: 1, the CDR2 comprises or consists of the sequence as set forth in SEQ ID NO: 2, and the CDR3 comprises or consists of the sequence as set forth in SEQ ID NO: 3.

3. The antibody or antigen-binding fragment thereof according to claim 1, wherein the heavy chain variable region comprises an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 4, SEQ ID NO: 7, SEQ ID NO: 10, SEQ ID NO: 31, SEQ ID NO: 16, SEQ ID NO: 19, SEQ ID NO: 25 or SEQ ID NO: 28.

4. The antibody or antigen-binding fragment thereof according to claim 3, wherein the heavy chain variable region comprises SEQ ID NO: 4 or consists of SEQ ID NO: 4.

5. The antibody or antigen-binding fragment thereof according to claim 1, wherein the heavy chain comprises:
an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 5;
an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92 %, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 8;
an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 11;
an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 32;
an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 17;

an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 20;
an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 26; or
an amino acid sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 29.

6. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody or antigen-binding fragment thereof is selected from an intact antibody, a single-chain antibody (scFv), a heavy chain antibody, a single domain antibody, a Fab fragment, a Fab' fragment, a F(ab')2, a Fv, a Fd fragment and a bispecific antibody (BsAb).

7. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody or antigen-binding fragment thereof is a heavy chain-only antibody.

8. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody or antigen-binding fragment thereof comprises or consists of two heavy chains.

9. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody or antigen-binding fragment thereof is a single domain antibody.

10. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody is a human antibody, a humanized antibody or a chimeric antibody.

11. The antibody according to claim 1, wherein the antibody or antigen-binding fragment thereof exhibits significant antibody-dependent cell-mediated cytotoxicity (ADCC).

12. A pharmaceutical composition comprising a therapeutically effective amount of the antibody or antigen-binding fragment thereof according to any one of claims 1 to 11 and a pharmaceutically acceptable carrier.

13. An isolated nucleic acid molecule encoding the antibody or antigen-binding fragment thereof according to claim 1.

14. A nucleic acid molecule according to claim 13, wherein the nucleic acid molecule comprises a nucleotide sequence that is at least 70%, 75%, 80%, 85%, 88%, 90%, 92%, 95%, 97%, 98%, 99% or 100% identical to SEQ ID NO: 6, SEQ ID NO: 9, SEQ ID NO: 12, SEQ ID NO: 18, SEQ ID NO: 21, SEQ ID NO: 27, SEQ ID NO: 30 or SEQ ID NO: 33.

15. An expression vector comprising the nucleic acid molecule according to claim 13 or 14.

16. A host cell expressing the antibody or antigen-binding fragment thereof according to any one of claims 1 to 11, and/or comprising the nucleic acid molecule according to claim 13 or 14 or the expression vector according to claim 33.

17. Use of the antibody or antigen-binding fragment thereof according to any one of claim 1 in the preparation of a medicament for treating a disease or condition, wherein the disease or condition is cancer or an autoimmune disease.

18. The use according to claim 17, wherein the cancer is selected from the group consisting of colorectal cancer, colon cancer, renal cell carcinoma, breast cancer, epithelial squamous cell carcinoma, melanoma, myeloma, gastric cancer, brain cancer, lung cancer, pancreatic cancer, cervical cancer, ovarian cancer, liver cancer, bladder cancer, prostate cancer, testicular cancer, thyroid cancer, head and neck cancer, leukemia and lymphoma.

19. The use according to claim 17 or 18, wherein the antibody or antigen-binding fragment thereof is for administration in combination with one or more additional chemotherapeutic agents, radiotherapeutic agents, cytokines or other antibodies.

20. A kit comprising

a) the antibody or antigen-binding fragment thereof according to any one of claims 1 to 11 or the pharmaceutical composition of claim 12; and

b) instructions for use.