

CLAIMS

1. An anti-BCMA single domain antibody, said single domain antibody is composed of framework regions and complementary determining regions, said complementary determining regions comprise the amino acid sequences of CDR1, CDR2, and CDR3 selected from SEQ ID NOs: 1-66.

2. The anti-BCMA single domain antibody according to claim 1, wherein said amino acid sequence of the complementary determining region has more than 80%, more than 85%, more than 90%, more than 95% or more than 99% identity to the amino acid sequences of CDR1, CDR2, and CDR3 as set forth in any one of SEQ ID NOs: 1-66, preferably, the difference in amino acids is conservative substitution.

3. The anti-BCMA single domain antibody according to claim 1, wherein said single domain antibody comprises the amino acid sequences of CDR1, CDR2, and CDR3 selected from SEQ ID NOs: 67-132.

4. The anti-BCMA single domain antibody according to claim 1, wherein said single domain antibody has an amino acid sequence selected from any one of SEQ ID NOs: 67-132 or is an amino acid sequence of any one of SEQ ID NOs: 67-132.

5. The anti-BCMA single domain antibody according to claim 4, wherein the amino acid sequence of the single domain antibody has more than 80%, more than 85%, more than 90%, more than 95% or more than 99% identity to the amino acid sequence as set forth in any one of SEQ ID NOs: 67-132, preferably, the difference in amino acids is conservative substitution.

6. A group of genes of anti-BCMA single domain antibodies, said genes of single domain antibody in the group have a nucleotide sequence selected from any one of SEQ ID NOs: 133-198, or being a nucleotide sequence of any one of SEQ ID NOs: 133-198, or being a nucleotide sequence encoding the single domain antibody according to claim 4 or 5.

7. The group of genes of anti-BCMA single domain antibodies according to claim 6, having a nucleotide sequence with more than 80%, more than 85%, more than 90%, more than 95% or more than 99% identity to the nucleotide sequence as set forth in any one of SEQ ID NOs: 133-198, wherein the difference in bases is preferably a conservative substitution.

8. A polypeptide, having one or multiple single domain antibodies according to any one of claims 1-5, wherein said multiple single domain antibodies are preferably the same or different.

9. An expression vector, comprising one or more genes selected from said group of genes of single domain antibodies according to claim 6 or 7, wherein said expression vector is preferably a prokaryotic cell expression vector, a eukaryotic cell expression vector or other cell expression vectors, more preferably, a lentiviral vector.

10. A host cell, comprising said expression vector according to claim 9, wherein said host cell is preferably a prokaryotic expression cell, a eukaryotic expression cell, a fungus cell or a yeast cell, and said prokaryotic expression cell is preferably Escherichia coil.

11. A chimeric antigen receptor, having one or multiple single domain antibodies according to any one of claims 1-5, wherein said multiple single domain antibodies are preferably the same or different.

12. A T cell modified by a chimeric antigen receptor, which is modified by said chimeric antigen receptor according to claim 11.

13. A pharmaceutical composition, comprising one or more single domain antibodies according to any one of claims 1-5 as active ingredients.

14. A humanized anti-BCMA single domain antibody obtained by humanizing the single domain antibody according to any one of claims 1-5.

15. Use of said single domain antibody according to any one of claims 1-5 in detection of BCMA.

16. Use of said single domain antibody according to any one of claims 1-5 for blocking an interaction between BAFF and BCMA.

17. The use according to claim 16, wherein said single domain antibody is linked to one or more of a cytotoxicity agent, an enzyme phase, a radioisotope, a fluorescent compound or a chemiluminescent compound.

18. Use of said single domain antibody according to any one of claims 1-5 in the manufacture of a medicament for treating a disease associated with abnormal BCMA expression.

19. The use according to claim 18, wherein said disease associated with abnormal BCMA expression is a multiple myeloma disease.