CLAIMS

That which is claimed is

1. A bispecific antibody comprising:

(a) a first polypeptide chain comprising a heavy chain of an anti-CD3 antibody fused with a single chain fragment (scFv) binding to hepatitis B virus surface antigen (HBsAg), wherein the HBsAg comprises small surface antigen, hepatitis B virus medium surface antigen, or hepatitis B virus large surface antigen; and

(b) a second polypeptide chain comprising a light chain of the anti-human CD3 antibody, wherein the light chain comprises a VL binding domain, wherein the VL binding domain comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 25 and the VL binding domain comprises the LCDR1, LCDR2, and LCDR3 as shown in SEQ ID NO: 14 to SEQ ID NO: 16, respectively.

2. The bispecific antibody according to claim 1, wherein the HBsAg scFv is fused to the N-terminus or C-terminus of the heavy chain of the anti-CD3 antibody.

3. The bispecific antibody according to claim 1, wherein the HBsAg scFv is fused to the heavy chain of the anti-CD3 antibody through a glycine-serine linker.

4. The bispecific antibody according to claim 1, wherein the glycine-serine linker is selected from $(GGGGS)_n$ as shown in SEQ ID NO: 33, $(GGGSG)_n$ as shown in SEQ ID NO: 34, $(GSGGG)_n$ as shown in SEQ ID NO: 35, $(GSGGGP)_n$ as shown in SEQ ID NO: 36, $(GSEPS)_n$ as shown in SEQ ID NO: 37, $(GGEGGGP)_n$ as shown in SEQ ID NO: 38, $(GGEGGGSEGGGS)_n$ as shown in SEQ ID NO: 39, $(GGGSGGGG)_n$ as shown in SEQ ID NO: 40 or a combination thereof, wherein the n=1, 2, 3, 4, 5, 6, 7, 8, 9 or 10.

5. The bispecific antibody according to claim 1, wherein the HBsAg scFv comprises the HCDR1, HCDR2, HCDR3, LCDR1, LCDR2, and LCDR3 as shown in SEQ ID NO: 1 to SEQ ID NO: 6, respectively.

and

the heavy chain of the CD3 antibody comprises the HCDR1, HCDR2, HCDR3, as shown in SEQ ID NO: 11 to SEQ ID NO: 13, respectively.

6. The bispecific antibody according to claim 5, wherein the scFv comprises a VH binding domain and a VL binding domain; wherein the VH comprises the amino acid sequence that is at least 90% identical to SEQ ID NO: 7; the VL comprises the amino acid sequence that is at least 90% identical to SEQ ID NO: 8.

7. The bispecific antibody according to claim 6, wherein the VH domain and VL domain are linked by a "YOL" linker; preferably, the "YOL" linker comprises the amino acid sequence of SEQ ID NO: 9.

8. The bispecific antibody according to claim 7, wherein the scFv comprises the amino acid sequence that is at least 90% identical to SEQ ID NO: 10.

9. The bispecific antibody according to claim 1, wherein the anti-CD3 antibody comprises a VH binding domain ; wherein the VH binding domain comprises the amino acid sequence that is at least 90% identical to SEQ ID NO: 19, SEQ ID NO: 20, SEQ ID NO: 21, SEQ ID NO: 22, SEQ ID NO: 23, or SEQ ID NO: 24

and the VH binding domain comprises the HCDR1, HCDR2, and HCDR3, as shown in SEQ ID NO: 11 to SEQ ID NO: 13, respectively.

10. The bispecific antibody according to claim 1, wherein the bispecific antibody is an IgG1-kappa isotype.

11. The bispecific antibody according to claim 1, wherein the bispecific antibody further comprises alanine at position 234 and alanine at position at 235 of heavy chain, wherein residue numbering is according to the EU Index.

12. The bispecific antibody according to claim 1, wherein,

the first polypeptide chain comprising amino acid sequence of SEQ ID NO: 41, SEQ ID NO: 42, SEQ ID NO: 43, SEQ ID NO: 44, SEQ ID NO: 45, SEQ ID NO: 46, SEQ ID NO: 47, SEQ ID NO: 48, SEQ ID NO: 49, SEQ ID NO: 50, SEQ ID NO: 51, or SEQ ID NO: 52; and

the second polypeptide chain comprising amino acid sequence of SEQ ID NO: 53.

13. A nucleic acid molecule encoding the bispecific antibody according to any one of claims 1-12.

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

15. A host cell, wherein the cell comprises the nucleic acid molecule according claim 13, or the vector according to claim 14.

16. A pharmaceutical composition comprising the bispecific antibody according to any one of claims 1-12, the nucleic acid molecule according to any one of claim 13, the vector according to claim 14, or the host cell according to claim 15 and a pharmaceutically acceptable excipient, diluent or carrier.

17. The bispecific antibody according to any one of claims 1-12, the nucleic acid molecule

according to any one of claim 13, the vector according to claim 14, and, or the pharmaceutical composition according to claim 16 for use in treating diseases caused by HBV infection.

18. The use of claim 17, wherein the diseases caused by HBV infection comprises hepatitis, liver fibrosis, liver cirrhosis, and liver cancer.

19. A CD3 antibody or an antigen-binding fragment thereof, comprising:

VH binding domain and VL binding domain; wherein the VH binding domain comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 19, SEQ ID NO: 20, SEQ ID NO: 21, SEQ ID NO: 22, SEQ ID NO: 23, or SEQ ID NO: 24, and the VH binding domain comprises the HCDR1, HCDR2, and HCDR3, as shown in SEQ ID NO: 11 to SEQ ID NO: 13, respectively;

and;

the VL binding domain comprises an amino acid sequence that is at least 90% identical to SEQ ID NO: 25 and the VL binding domain comprises the LCDR1, LCDR2, and LCDR3 as shown in SEQ ID NO: 14 to SEQ ID NO: 16, respectively.

20. A bispecific antigen-binding molecule comprising the CD3 antibody or an antigen-binding fragment thereof according to claim 19.

21. A nucleic acid molecule encoding CD3 antibody or an antigen-binding fragment thereof according to claim 19.

22. A nucleic acid molecule encoding the bispecific antigen-binding molecule according to claim 20.