Claims

1. A T cell receptor (TCR), comprising:
a TCRα chain variable region comprising a αCDR1, a αCDR2 and a αCDR3 as shown in SEQ ID NO: 1, SEQ ID NO: 2 and SEQ ID NO: 3, respectively;
and;
a TCRβ chain variable region comprising a βCDR1, a βCDR2 and a βCDR3 as shown in SEQ ID NO: 4, SEQ ID NO: 5 and SEQ ID NO:6, respectively;;
or;
a TCRα chain variable region comprising a αCDR1, a αCDR2 and a αCDR3 as shown in SEQ ID NO: 13, SEQ ID NO: 14 and SEQ ID NO: 15, respectively;
and;
a TCRβ chain variable region comprising a βCDR1, a βCDR2 and a βCDR3 as shown in SEQ ID NO: 16, SEQ ID NO: 17 and SEQ ID NO: 18, respectively;
;
or;
a TCRα chain variable region comprising a αCDR1, a αCDR2 and a αCDR3 as shown in SEQ ID NO: 1, SEQ ID NO: 2 and SEQ ID NO: 24, respectively;
and;
a TCRβ chain variable region comprising a βCDR1, a βCDR2 and a βCDR3 as shown in SEQ ID NO: 4, SEQ ID NO: 5 and SEQ ID NO: 25, respectively.

2. The TCR according to claim 1, wherein the TCRα chain variable region comprises the amino acid sequence that is at least 90% identical to any one of SEQ ID NO: 7, SEQ ID NO: 19 and SEQ ID NO: 26, wherein the amino acid sequence of αCDR1, αCDR2 and αCDR3 are invariable.

3. The TCR according to claim 1, wherein the TCRβ chain variable region comprises the amino acid sequence that is at least 90% identical to any one of SEQ ID NO: 8, SEQ ID NO: 20 and SEQ ID NO: 27, wherein the amino acid sequence of βCDR1, βCDR2 and βCDR3 are invariable.

4. The TCR according to claim 1, wherein the TCRα chain comprises amino acid sequence set forth in SEQ ID NO:10, SEQ ID NO:21 or SEQ ID NO: 28.

5. The TCR according to claim 1, wherein the TCRβ chain comprises amino acid sequence set forth in SEQ ID NO: 11, SEQ ID NO: 22 or SEQ ID NO: 29.

6. The TCR according to any one of claims 1 to 5, which is capable of binding to a polypeptide of HBV surface antigen presented by HLA-A2.

7. The TCR according to claim 6, wherein the polypeptide comprises or consists of the amino acid sequence FLLTRILTI (SEQ ID NO: 31) or FLLTKILTI (SEQ ID NO: 32).

8. The TCR according to claim 1, wherein the C- or N-terminal of the α chain and/or β chain of TCR is combined with conjugates, and the conjugates are a detectable marker, a therapeutic agent, a PK modifying moiety, or combination of them.

9. A nucleic acid molecule encoding the TCR molecule or fragment according to any one of claims 1-7.

10. The nucleic acid molecule of claim 9, wherein the coding sequence of the variable region of the TCRα chain is set forth in SEQ ID NO: 33, SEQ ID NO: 38 or SEQ ID NO: 43;
and/or;
the coding sequence of the variable region of the TCR beta chain is set forth in SEQ ID NO: 34, SEQ ID NO: 39 or SEQ ID NO: 44.

11. The nucleic acid molecule of claim 9, wherein the coding sequence of the TCRα chain is set forth in SEQ ID NO: 35, SEQ ID NO: 40 or SEQ ID NO: 45;

and/or;

the coding sequence of the TCRβ chain is set forth in SEQ ID NO: 36, SEQ ID NO: 41 or SEQ ID NO: 46.

12. An expression vector comprising the nucleic acid molecule according to any one of claims 9-11.

13. An isolated polypeptide encoded by the nucleic acid molecule according to any one of claims 9 to 11 or the expression vector of claim 12.

14. A host cell, wherein the cell comprises the TCR or fragment according to any one of claims 1-7, the nucleic acid molecule according to any one of claims 9-11, the vector according to claim 12, or the polypeptide according to claim 13.

15. A pharmaceutical composition comprising the TCR or fragment according to any one of claims 1-8, the nucleic acid molecule according to any one of claims 9-11, the vector according to claim 12, the polypeptide according to claim 13, or the host cell according to claim 14 and a pharmaceutically acceptable excipient, diluent, or carrier, wherein the host cell is a T cell.

16. The TCR according to any one of claims 1-8, the nucleic acid molecule according to any one of claims 9-11, the vector according to claim 12, the polypeptide according to claim 13, the cell according to claim 14, or the pharmaceutical composition according to claim 15 for use in treating diseases caused by HBV infection, wherein the host cell is a T cell.

17. The TCR of claim 16, wherein the diseases caused by HBV infection comprise hepatitis, liver fibrosis, liver cirrhosis, and liver cancer.