

CLAIMS

1. An antibody or antigen binding fragment binding to a human and/or a monkey PD-L1 protein, comprising HCDR1, HCDR2 and HCDR3 and LCDR1, LCDR2 and LCDR3, wherein the HCDR1 comprises an amino acid sequence as set forth in SEQ ID NO: 1, the HCDR2 comprises an amino acid sequence as set forth in SEQ ID NO: 2, and the HCDR3 comprises an amino acid sequence as set forth in SEQ ID NO: 3, the LCDR1 comprises an amino acid sequence as set forth in SEQ ID NO: 4, the LCDR2 comprises an amino acid sequence as set forth in SEQ ID NO: 5, and the LCDR3 comprises an amino acid sequence as set forth in SEQ ID NO: 6.
2. The antibody or antigen binding fragment according to claim 1, wherein the antigen-binding fragment includes a Fab, a Fab', a F(ab)₂, a Fv fragment, a F(ab')₂, a scFv, a di-scFv, a VHH and/or a dAb.
3. The antibody or antigen binding fragment according to claim 1 or 2, wherein the antibody is selected from the group consisting of a monoclonal antibody, a chimeric antibody, a humanized antibody and a fully human antibody.
4. The antibody or antigen binding fragment according to any one of claims 1 to 3, comprising H-FR1, H-FR2, H-FR3 and H-FR4, and the H-FR1, H-FR2, H-FR3 and H-FR4 are selected from any one of groups of amino acid sequences as follows:
 - (1) H-FR1: SEQ ID NO: 7, H-FR2: SEQ ID NO: 9, H-FR3: SEQ ID NO: 12 and H-FR4: SEQ ID NO: 18;
 - (2) H-FR1: SEQ ID NO: 8, H-FR2: SEQ ID NO: 10, H-FR3: SEQ ID NO: 13 and H-FR4: SEQ ID NO: 19;
 - (3) H-FR1: SEQ ID NO: 8, H-FR2: SEQ ID NO: 11, H-FR3: SEQ ID NO: 14 and H-FR4: SEQ ID NO: 18;
 - (4) H-FR1: SEQ ID NO: 8, H-FR2: SEQ ID NO: 10, H-FR3: SEQ ID NO: 15 and H-FR4: SEQ ID NO: 19;
 - (5) H-FR1: SEQ ID NO: 8, H-FR2: SEQ ID NO: 10, H-FR3: SEQ ID NO: 16 and

H-FR4: SEQ ID NO: 19; and

(6) H-FR1: SEQ ID NO: 8, H-FR2: SEQ ID NO: 11, H-FR3: SEQ ID NO: 17 and
H-FR4: SEQ ID NO: 19.

5. The antibody or antigen binding fragment according to any one of claims 1 to 4, wherein the VH comprises an amino acid sequence as set forth in any one of SEQ ID NO: 20 to 25.
6. The antibody or antigen binding fragment according to any one of claims 1 to 5, wherein the antibody or antigen binding fragment comprises a heavy chain constant region, and the heavy chain constant region is derived from a human IgG constant region, optionally, the heavy chain constant region is derived from a human IgG1 constant region, and the human IgG1 constant region comprises an amino acid sequence as set forth in SEQ ID NO: 41.
7. The antibody or antigen binding fragment according to any one of claims 1 to 6, wherein the antibody or antigen binding fragment comprises an antibody heavy chain HC, and the HC comprises an amino acid sequence as set forth in any one of SEQ ID NO: 42 to 46.
8. The antibody or antigen binding fragment according to any one of claims 1 to 7, comprising L-FR1, L-FR2, L-FR3 and L-FR4, and the L-FR1, L-FR2, L-FR3 and L-FR4 are selected from any one of groups of amino acid sequences as follows:
 - (1) L-FR1: SEQ ID NO: 26, L-FR2: SEQ ID NO: 28, L-FR3: SEQ ID NO: 30 and L-FR4: SEQ ID NO: 34;
 - (2) L-FR1: SEQ ID NO: 27, L-FR2: SEQ ID NO: 29, L-FR3: SEQ ID NO: 31 and L-FR4: SEQ ID NO: 35;
 - (3) L-FR1: SEQ ID NO: 27, L-FR2: SEQ ID NO: 29, L-FR3: SEQ ID NO: 32 and L-FR4: SEQ ID NO: 35; and
 - (4) L-FR1: SEQ ID NO: 27, L-FR2: SEQ ID NO: 29, L-FR3: SEQ ID NO: 33 and L-FR4: SEQ ID NO: 35.
9. The antibody or antigen binding fragment according to any one of claims 1 to 8, wherein the VL comprises an amino acid sequence as set forth in any one of SEQ ID NO: 36 to

39.

10. The antibody or antigen binding fragment according to any one of claims 1 to 9, comprising a heavy chain variable region VH and a light chain variable region VL, wherein

VH comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 20, and the VL comprises or consists of an amino acid sequence as set forth in SEQ ID NO:36;

VH comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 21, and the VL comprises or consists of an amino acid sequence as set forth in SEQ ID NO:37;

VH comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 22, and the VL comprises or consists of an amino acid sequence as set forth in SEQ ID NO:38;

VH comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 23, and the VL comprises or consists of an amino acid sequence as set forth in SEQ ID NO:37;

VH comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 24, and the VL comprises or consists of an amino acid sequence as set forth in SEQ ID NO:37; or

VH comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 25, and the VL comprises or consists of an amino acid sequence as set forth in SEQ ID NO:39.

11. The antibody or antigen binding fragment according to any one of claims 1 to 10, wherein the antibody or antigen binding fragment comprises an antibody light chain constant region, and optionally the antibody light chain constant region comprises an amino acid sequence as set forth in SEQ ID NO: 40.

12. The antibody or antigen binding fragment according to any one of claims 1 to 11, wherein the antibody or antigen binding fragment comprises an antibody light chain LC, and the LC comprises an amino acid sequence as set forth in any one of SEQ ID NO: 47 to 49.

13. The antibody or antigen binding fragment according to any one of claims 1 to 12, comprising a heavy chain HC and a light chain LC, wherein

HC comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 42, and the LC comprises or consists of an amino acid sequence as set forth in SEQ ID NO:47;

HC comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 43, and

- the LC comprises or consists of an amino acid sequence as set forth in SEQ ID NO:48;
HC comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 44, and
the LC comprises or consists of an amino acid sequence as set forth in SEQ ID NO:47;
HC comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 45, and
the LC comprises or consists of an amino acid sequence as set forth in SEQ ID NO:47; or
HC comprises or consists of an amino acid sequence as set forth in SEQ ID NO: 46, and
the LC comprises or consists of an amino acid sequence as set forth in SEQ ID NO:49.
14. An immunoconjugate comprising the antibody or antigen binding fragment of any one of claims 1 to 13.
 15. An isolated nucleic acid molecule(s) encoding the antibody or antigen binding fragment of any one of claims 1 to 13.
 16. A vector comprising the nucleic acid molecule according to claim 15.
 17. A cell comprising the nucleic acid molecule according to claim 15 or the vector according to claim 16.
 18. A method for preparing the antibody or antigen binding fragment of any one of claims 1 to 13, comprising culturing the cell according to claim 17 under conditions that the antibody or antigen binding fragment of any one of claims 1 to 13 can be expressed.
 19. A pharmaceutical composition comprising the antibody or antigen binding fragment of any one of claims 1 to 13, the nucleic acid molecule of claim 15, the vector of claim 16 and/or the cell of claim 17, and optionally a pharmaceutically acceptable carrier.
 20. Use of the antibody or antigen binding fragment of any one of claims 1 to 13, the immunoconjugate of claim 14, the nucleic acid molecule of claim 15, the vector of claim 16, the cell of claim 17 and/or the pharmaceutical composition of claim 19 in the manufacture of a medicament for preventing, alleviating and/or treating a tumor, preferably, the tumor includes a tumor with a high expression of PD-1 or PD-L1; optionally, the tumor includes a solid tumor; optionally the tumor includes breast cancer, lung cancer, gastric cancer and urothelial carcinoma.
 21. The antibody or antigen binding fragment of any one of claims 1 to 13, the

immunoconjugate of claim 14, the nucleic acid molecule of claim 15, the vector of claim 16, the cell of claim 17 and/or the pharmaceutical composition of claim 19, for use in preventing, alleviating or treating a tumor, preferably, the tumor includes a tumor with a high expression of PD-1 or PD-L1; optionally the tumor includes a solid tumor; optionally the tumor includes breast cancer, lung cancer, gastric cancer and urothelial carcinoma.

22. The antibody or antigen binding fragment of any one of claims 1 to 13, the immunoconjugate of claim 14, the nucleic acid molecule of claim 15, the vector of claim 16, the cell of claim 17 and/or the pharmaceutical composition of claim 19, for use in inhibiting the binding of PD-1 protein to PD-L1 protein or for use in stimulating the secretion of cytokines in immune cells.
23. A method for detecting the presence and/or content of PD-L1 protein, comprising administering the antibody or antigen binding fragment of any one of claims 1 to 13.
24. A kit comprising the antibody or antigen binding fragment of any one of claims 1 to 13, the immunoconjugate of claim 14, the nucleic acid molecule of claim 15, the vector of claim 16, the cell of claim 17 and/or the pharmaceutical composition of claim 19.