Claims

1. An antibody or antigen-binding fragment thereof that binds to PD-L1, wherein the antibody comprises:

(i) three complementary determining regions HCDRs of a heavy chain variable region shown in SEQ ID NO: 26 or 30, and three complementary determining regions LCDRs of a light chain variable region shown in SEQ ID NO: 32 or 36, or

(ii) three complementary determining regions HCDRs of a heavy chain variable region shown in SEQ ID NO: 27, and three complementary determining regions LCDRs of a light chain variable region shown in SEQ ID NO: 33, or

(iii) three complementary determining regions HCDRs of a heavy chain variable region shown in SEQ ID NO: 28, and three complementary determining regions LCDRs of a light chain variable region shown in SEQ ID NO: 34, or

(iv) three complementary determining regions HCDRs of a heavy chain variable region shown in SEQ ID NO: 29 or 31, and three complementary determining regions LCDRs of a light chain variable region shown in SEQ ID NO: 35 or 37.

2. An antibody or antigen-binding fragment thereof that binds to PD-L1, the antibody comprising three complementarity determining regions (HCDRs) HCDR1, HCDR2, HCDR3 of a heavy chain variable region and three complementarity determining regions (LCDRs) LCDR1, LCDR2, LCDR3 of a light chain variable region, wherein the HCDR1, HCDR2, HCDR3, LCDR1, LCDR2 and LCDR3 comprises the amino acid sequence as shown respectively in:

(1) SEQ ID NO: 1, SEQ ID NO: 5, SEQ ID NO: 10, SEQ ID NO: 14, SEQ ID NO: 17, and SEQ ID NO: 21;
(2) SEQ ID NO: 2, SEQ ID NO: 6, SEQ ID NO: 11, SEQ ID NO: 15, SEQ ID NO: 18, and SEQ ID NO: 22;
(3) SEQ ID NO: 2, SEQ ID NO: 7, SEQ ID NO: 12, SEQ ID NO: 15, SEQ ID NO: 18, and SEQ ID NO: 23; or
(4) SEQ ID NO: 3, SEQ ID NO: 8, SEQ ID NO: 13, SEQ ID NO: 16, SEQ ID NO: 19 and SEQ ID NO: 24.

3. The antibody or antigen-binding fragment thereof according to claim 2, wherein the HCDR1, HCDR2, HCDR3, LCDR1, LCDR2 and LCDR3 consists of the amino acid sequence as shown respectively in:
(1) SEQ ID NO: 1, SEQ ID NO: 5, SEQ ID NO: 10, SEQ ID NO: 14, SEQ ID NO: 17, and SEQ ID NO: 21;
(2) SEQ ID NO: 2, SEQ ID NO: 6, SEQ ID NO: 11, SEQ ID NO: 15, SEQ ID NO: 18, and SEQ ID NO: 22;
(3) SEQ ID NO: 2, SEQ ID NO: 7, SEQ ID NO: 12, SEQ ID NO: 15, SEQ ID NO: 18, and SEQ ID NO: 23; or
(4) SEQ ID NO: 3, SEQ ID NO: 8, SEQ ID NO: 13, SEQ ID NO: 16, SEQ ID NO: 19 and SEQ ID NO: 24.

4. The antibody or antigen-binding fragment thereof according to any one of Claims 1 to 3, the antibody comprising a light chain variable region and/or a heavy chain variable region, wherein

(i) the heavy chain variable region comprises or consists of an amino acid sequence having at least 90% identity to an amino acid sequence selected from SEQ ID NO: 26 or 30; and/or

the light chain variable region comprises or consists of an amino acid sequence having at least 90% identity to an amino acid sequence selected from SEQ ID NO: 32 or 36;

(ii) the heavy chain variable region comprises or consists of an amino acid sequence having at least 90% identity to an amino acid sequence of SEQ ID NO: 27; and/or

the light chain variable region comprises or consists of an amino acid sequence having at least 90% identity to an amino acid sequence of SEQ ID NO: 33;

(iii) the heavy chain variable region comprises or consists of an amino acid sequence having at least 90% identity to an amino acid sequence of SEQ ID No: 28; and/or

the light chain variable region comprises or consists of an amino acid sequence having at least 90% identity to an amino acid sequence of SEQ ID NO: 34;

(iv) the heavy chain variable region comprises or consists of an amino acid sequence having at least 90% identity to an amino acid sequence selected from SEQ ID NO: 29 or 31; and/or

the light chain variable region comprises or consists of an amino acid sequence having at least 90% identity to an amino acid sequence selected from SEQ ID NO: 35 or 37.

5. The antibody or antigen-binding fragment thereof according to any one of Claims 1 to 3, the antibody comprising a light chain variable region and/or a heavy chain variable region, wherein

(i) the heavy chain variable region comprises an amino acid sequence of SEQ ID NO: 26 or 30; and/or

the light chain variable region comprises an amino acid sequence of SEQ ID NO: 32 or 36;

(ii) the heavy chain variable region comprises an amino acid sequence of SEQ ID NO: 27; and/or

the light chain variable region comprises an amino acid sequence of SEQ ID NO: 33;

(iii) the heavy chain variable region comprises an amino acid sequence of SEQ ID NO: 28; and/or

the light chain variable region comprises an amino acid sequence of SEQ ID NO: 34;

(iv) the heavy chain variable region comprises an amino acid sequence of SEQ ID NO: 29 or 31; and/or

the light chain variable region comprises an amino acid sequence of SEQ ID NO: 35 or 37.

6. The antibody or antigen-binding fragment thereof according to any one of Claims 1 to 3, the antibody comprising a light chain variable region and a heavy chain variable region, wherein the light chain variable region and the heavy chain variable region comprises an amino acid sequence as shown in, respectively

(1) SEQ ID NO:26 and SEQ ID NO:32;

(2) SEQ ID NO:27 and SEQ ID NO:33;

(3) SEQ ID NO:28 and SEQ ID NO:34;

(4) SEQ ID NO:29 and SEQ ID NO:35;

(5) SEQ ID NO:30 and SEQ ID NO:36; or

(6) SEQ ID NO:31 and SEQ ID NO:37.

7. The antibody or antigen-binding fragment thereof according to any one of Claims 1 to 3, the antibody comprising:

(a) a heavy chain

(i) comprising or consisting of an amino acid sequence having at least 85% identity to an amino acid sequence selected from SEQ ID NO: 38, 42, 43, or 44; or

(ii) comprising or consisting of an amino acid sequence selected from SEQ ID NO: 38, 42, 43, or 44;

and/or

(b) a light chain

(i) comprising or consisting of an amino acid sequence having at least 85% identity to an amino acid sequence selected from SEQ ID NO: 46 or 50; or

(ii) comprising or consisting of an amino acid sequence selected from SEQ ID NO: 46 or 50; or

(a) a heavy chain

(i) comprising or consisting of an amino acid sequence having at least 85% identity to an amino acid sequence of SEQ ID NO: 39; or

(ii) comprising or consisting of an amino acid sequence of SEQ ID NO: 39;

and/or

(b) a light chain

(i) comprising or consisting of an amino acid sequence having at least 85% identity to an amino acid sequence of SEQ ID NO: 47; or

(ii) comprising or consisting of an amino acid sequence of SEQ ID NO: 47; or

(a) a heavy chain

(i) comprising or consisting of an amino acid sequence having at least 85% identity to an amino acid sequence of SEQ ID NO: 40; or

(ii) comprising or consisting of an amino acid sequence of SEQ ID NO: 40;

and/or

(b) a light chain

(i) comprising or consisting of an amino acid sequence having at least 85% identity to an amino acid sequence of SEQ ID NO: 48; or

(ii) comprising or consisting of an amino acid sequence of SEQ ID NO: 48; or

(a) a heavy chain

(i) comprising or consisting of an amino acid sequence having at least 85% identity to an amino acid sequence selected from SEQ ID NO: 41 or 45; or

(ii) comprising or consisting of an amino acid sequence selected from SEQ ID NO: 41 or 45;

and/or

(b) a light chain

(i) comprising or consisting of an amino acid sequence having at least 85% identity to an amino acid sequence selected from SEQ ID NO: 49 or 51; or

(ii) comprising or consisting of an amino acid sequence selected from SEQ ID NO: 49 or 51.

8. The antibody or antigen-binding fragment thereof according to any one of Claims 1 to 3, the antibody comprising a heavy chain and a light chain, wherein the heavy chain and the light chain comprises the amino acid sequence as shown in, respectively,

(1) SEQ ID NO:38 and SEQ ID NO:46;

(2) SEQ ID NO:39 and SEQ ID NO:47;

(3) SEQ ID NO:40 and SEQ ID NO:48;

(4) SEQ ID NO:41 and SEQ ID NO:49;

(5) SEQ ID NO:42 and SEQ ID NO:50;

(6) SEQ ID NO:43 and SEQ ID NO:50;

(7) SEQ ID NO:44 and SEQ ID NO:50; or

(8) SEQ ID NO:45 and SEQ ID NO:51.

9. The anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 8, wherein the antibody is an antibody or an antigen-binding fragment in the form of IgG1 or IgG4, and/or the anti-PD-L1 antibody or antigen-binding fragment thereof comprises a κ light chain constant region, e.g., a human κ light chain constant region.

10. The anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 9, wherein the antibody is a monoclonal antibody.

11. The anti-PD-L1 antibody or antigen-binding fragment thereof according to any of Claims 1 to 10, wherein the antibody is a humanized antibody or human antibody or a chimeric antibody.

12. The antibody or antigen-binding fragment thereof according to any one of Claims 1 to 11, wherein the antigen-binding fragment is an antibody fragment selected from the group consisting of: Fab, Fab', Fab'-SH, Fv, scFv, $(Fab')_2$ fragments, single domain antibodies, diabodies (dAbs), or linear antibodies.

13. The antibody or antigen-binding fragment thereof according to any one of Claims 1 to 12, wherein the antibody is a bispecific or multispecific antibody.

14. The antibody or antigen-binding fragment thereof according to claim 13, wherein the bispecific antibody binds to PD-L1 and LAG-3.

15. An isolated nucleic acid encoding the anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 14.

16. A vector comprising the nucleic acid according to Claim 15, wherein, the vector is an expression vector.

17. A host cell comprising the nucleic acid according to Claim 15 or the vector according to Claim 16.

18. A method for preparing an anti-PD-L1 antibody or antigen-binding fragment thereof, the method comprising incubating the host cell according to Claim 17 in conditions suitable for expression of a nucleic acid encoding the anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 14.

19. An immunoconjugate, comprising the anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 14, and an additional substance.

20. A pharmaceutical composition, comprising the anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 14 or the immunoconjugate according to Claim 19, and a pharmaceutical supplementary material.

21. A pharmaceutical composition, comprising the anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 14 or the immunoconjugate according to Claim 19, an additional therapeutic agent, and a pharmaceutical supplementary material.

22. The pharmaceutical composition according to claim 21, wherein, the additional therapeutic agent is selected from the group consisting of chemotherapeutic agents, other antibodies, cytotoxic agents, vaccines, anti-infection active agents, immunomodulatory agents, or the combinations

thereof.

23. The pharmaceutical composition according to claim 22, wherein the immunomodulatory agent is an activator of co-stimulatory molecules or an inhibitor of immune checkpoint molecules.

24. The pharmaceutical composition according to claim 22, wherein the other antibody is an anti-LAG-3 antibody.

25. The pharmaceutical composition according to claim 24, wherein the anti-LAG-3 antibody is humanized.

26. The pharmaceutical composition according to Claim 24, wherein the anti-LAG-3 antibody comprises:

(i) three heavy-chain complementarity determining regions (HCDRs) of the heavy chain variable region shown in SEQ ID NO: 75, and/or

(ii) three light-chain complementarity determining regions (LCDRs) of the light chain variable region shown in SEQ ID NO: 76.

27. The pharmaceutical composition according to Claim 24, wherein the anti-LAG-3 antibody comprises a heavy chain variable region (VH) and/or a light chain variable region (VL), wherein

(i) the VH comprises complementarity determining regions (CDRs) HCDR1, HCDR2 and HCDR3, wherein the HCDR1 comprises or consists of the amino acid sequence of SEQ ID NO: 69; the HCDR2 comprises an amino acid sequence selected from SEQ ID NO: 70 or consists of the amino acid sequence; the HCDR3 comprises or consists of the amino acid sequence of SEQ ID NO: 71;

and/or

(ii) the VL comprises complementarity determining regions (CDRs) LCDR1, LCDR2, and LCDR3, wherein the LCDR1 comprises or consists of the amino acid sequence of SEQ ID NO: 72; the LCDR2 comprises or consists of the amino acid sequence of SEQ ID NO: 73; the LCDR3 comprises an amino acid sequence selected from SEQ ID NO: 74 or consists of the amino acid sequence.

28. The pharmaceutical composition according to Claim 24, wherein the anti-LAG-3 antibody comprises a heavy chain variable region (VH) and/or a light chain variable region (VL), wherein

(i) the heavy chain variable region comprises or consists of the amino acid sequence as shown in SEQ ID NO: 75, and/or

(ii) the light chain variable region comprises or consists of the amino acid sequence as shown in SEQ ID NO: 76.

29. The anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 14 or the immunoconjugate according to Claim 19, or the pharmaceutical composition according to any one of claims 20 to 23, for preventing or treating cancer or an infectious disease in a subject or an individual in need thereof, wherein the preventing or treating comprises the anti-PD-L1 antibody or antigen-binding fragment thereof, the immunoconjugate or the pharmaceutical composition, to be administered to the subject or the individual.

30. The anti-PD-L1 antibody or antigen-binding fragment thereof, the immunoconjugate or the pharmaceutical composition according to Claim 29, wherein the preventing or treating comprises the anti-PD-L1 antibody or antigen-binding fragment thereof, the immunoconjugate or the pharmaceutical composition, to be administered to the subject or the individual in combination with

an anti-LAG-3 antibody.

31. The anti-PD-L1 antibody or antigen-binding fragment thereof, the immunoconjugate or the pharmaceutical composition according to claim 29 or 30, wherein the cancer is colon cancer, or the infectious disease is a chronic infection.

32. The anti-PD-L1 antibody or antigen-binding fragment thereof, the immunoconjugate or the pharmaceutical composition according to claim 30, wherein the anti-LAG-3 antibody comprises:

(i) three heavy-chain complementarity determining regions (HCDRs) of the heavy chain variable region shown in SEQ ID NO: 75, and/or

(ii) three light-chain complementarity determining regions (LCDRs) of the light chain variable region shown in SEQ ID NO: 76.

33. The anti-PD-L1 antibody or antigen-binding fragment thereof, the immunoconjugate or the pharmaceutical composition according to claim 30, wherein the anti-LAG-3 antibody comprises a heavy chain variable region (VH) and/or a light chain variable region (VL), wherein

(i) the VH comprises complementarity determining regions (CDRs) HCDR1, HCDR2 and HCDR3, wherein the HCDR1 comprises or consists of the amino acid sequence of SEQ ID NO: 69; the HCDR2 comprises an amino acid sequence selected from SEQ ID NO: 70 or consists of the amino acid sequence; the HCDR3 comprises or consists of the amino acid sequence of SEQ ID NO: 71;

and/or

(ii) the VL comprises complementarity determining regions (CDRs) LCDR1, LCDR2, and LCDR3, wherein the LCDR1 comprises or consists of the amino acid sequence of SEQ ID NO: 72; the LCDR2 comprises or consists of the amino acid sequence of SEQ ID NO: 73; the LCDR3 comprises an amino acid sequence selected from SEQ ID NO: 74 or consists of the amino acid sequence.

34. The anti-PD-L1 antibody or antigen-binding fragment thereof, the immunoconjugate or the pharmaceutical composition according to claim 30, wherein the anti-LAG-3 antibody comprises a heavy chain variable region (VH) and/or a light chain variable region (VL), wherein (i) the heavy chain variable region comprises or consists of the amino acid sequence as shown in SEQ ID NO: 75, and/or

(ii) the light chain variable region comprises or consists of the amino acid sequence as shown in SEQ ID NO: 76.

35. Use of an effective amount of the anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of Claims 1 to 14, or the immunoconjugate according to Claim 19 in the manufacture of a medicament for preventing or treating cancer or an infectious disease.