What is claimed is:

1. An isolated antibody or fragment thereof, wherein the antibody or fragment thereof has specificity to a human Programmed death-ligand 1 (PD-L1) protein and comprises a VH CDR1 comprising the amino acid sequence of SEQ ID NO: 1, a VH CDR2 comprising the amino acid sequence of SEQ ID NO: 2 or SEQ ID NO: 2 with a substitution selected from D52E, G53A or G53V according to Kabat numbering, a VH CDR3 comprising the amino acid sequence of SEQ ID NO: 3, a VL CDR1 comprising the amino acid sequence of SEQ ID NO: 4, a VL CDR2 comprising the amino acid sequence of SEQ ID NO: 5, and a VL CDR3 comprising the amino acid sequence of SEQ ID NO: 6.

2. The antibody or fragment thereof of claim 1, further comprising a heavy chain constant region, a light chain constant region, an Fc region, or the combination thereof.

3. The antibody or fragment thereof of claim 1 or 2, wherein the antibody or fragment thereof is a humanized antibody.

4. An isolated antibody or fragment thereof, wherein the antibody or fragment thereof has specificity to a human Programmed death-ligand 1 (PD-L1) protein, comprising a heavy chain variable region comprising an amino acid sequence selected from the group consisting of SEQ ID NO: 7-26, and, comprising a light chain variable region comprising an amino acid sequence selected from the group consisting of SEQ ID NO: 27-33.

5. The antibody or fragment thereof of claim 4, comprising a heavy chain variable region comprising the amino acid sequence of SEQ ID NO: 20 and a light chain variable region comprising the amino acid sequence of SEQ ID NO: 28.

6. A composition comprising the antibody or fragment thereof of any one of claims 1-5 and a pharmaceutically acceptable carrier.

7. An isolated cell comprising one or more polynucleotide encoding the antibody or fragment thereof of any one of claims 1-5.

8. An isolated antibody or fragment thereof, wherein the antibody or fragment thereof has specificity to a human PD-L1 protein and comprises:

(a) a VH CDR1 of SEQ ID NO: 1, or a variant of SEQ ID NO: 1 having a single substitution, deletion or insertion at location 1, 2 or 5 of SEQ ID NO: 1;

(b) a VH CDR2 of SEQ ID NO: 2, or a variant of SEQ ID NO: 2 having a single substitution, deletion or insertion at location 7, 8, 14 or 15 of SEQ ID NO: 2;

(c) a VH CDR3 of SEQ ID NO: 3, or a variant of SEQ ID NO: 3 having a single substitution, deletion or insertion at location 1, 2, 3, 4, 5 or 6 of SEQ ID NO: 3;

(d) a VL CDR1 of SEQ ID NO: 4, or a variant of SEQ ID NO: 4 having a single substitution, deletion or insertion at location 3 of SEQ ID NO: 4;

(e) a VL CDR2 of SEQ ID NO: 5, or a variant of SEQ ID NO: 5 having a single substitution, deletion or insertion at location 1, 2, 3, 4, 5 or 6 of SEQ ID NO: 5 and

(f) a VL CDR3 of SEQ ID NO: 6, or a variant of SEQ ID NO: 6 having a single substitution, deletion or insertion at location 1 or 2 of SEQ ID NO: 6.

9. The antibody or fragment thereof of claim 8, wherein the variant of SEQ ID NO: 1 is selected from the group consisting of SEQ ID NO: 61-67.

10. The antibody or fragment thereof of claim 8, wherein the variant of SEQ ID NO: 2 is selected from the group consisting of SEQ ID NO: 68-77.

11. The antibody or fragment thereof of claim 8, wherein the variant of SEQ ID NO: 3 is selected from the group consisting of SEQ ID NO: 78-90.

12. The antibody or fragment thereof of claim 8, wherein the variant of SEQ ID NO: 4 is selected from the group consisting of SEQ ID NO: 91-92.

13. The antibody or fragment thereof of claim 8, wherein the variant of SEQ ID NO: 5 is selected from the group consisting of SEQ ID NO: 93-105.

14. The antibody or fragment thereof of claim 8, wherein the variant of SEQ ID NO: 6 is selected from the group consisting of SEQ ID NO: 106-111.

15. An isolated bispecific antibody comprising a fragment of any one of claims 1-5 or 8-14 and a second antigen-binding fragment having specificity to a molecule on an immune cell.

16. The bispecific antibody of claim 15, wherein the molecule is selected from the group consisting of PD-1, CTLA-4, LAG-3, CD28, CD122, 4-1BB, TIM3, OX-40, OX40L, CD40, CD40L, LIGHT, ICOS, ICOSL, GITR, GITRL, TIGIT, CD27, VISTA, B7H3, B7H4, HEVM, BTLA, KIR, and CD47.

17. The bispecific antibody of claim 15 or 16, wherein the fragment and the second fragment each is independently selected from a Fab fragment, a single-chain variable fragment (scFv), or a single-domain antibody.

18. The bispecific antibody of claim 16 or 17, further comprising a Fc fragment.

19. Use of an effective amount of the antibody or fragment thereof of any one of claims 1-5 in the preparation of a medicament for treating cancer or infection in a patient in need thereof wherein PD-L1 is expressed or is induced to express in the patient.

20. The use of claim 19, wherein the cancer is selected from the group consisting of bladder cancer, liver cancer, colon cancer, rectal cancer, endometrial cancer, leukemia, lymphoma, pancreatic cancer, small cell lung cancer, non-small cell lung cancer, breast cancer, urethral cancer, head and neck cancer, gastrointestinal cancer, stomach cancer, oesophageal cancer, ovarian cancer, renal cancer, melanoma, prostate cancer and thyroid cancer.

21. Use of a T cell, that has been treated in vitro, with the antibody or fragment thereof of any one of claims 1-5 in the preparation of a medicament for treating cancer or infection in a patient in need thereof wherein PD-L1 is expressed or is induced to express in the patient.

22. The use according to claim 21, further comprising, prior to treating the T cell, isolating the T cell from an individual.

23. The use according to claim 21 or 22, wherein the T cell is isolated from the patient.

24. The use according to claim 21 or 22, wherein the T cell is isolated from a donor individual different from the patient.

25. The use according to any one of claims 21 - 24, wherein the T cell is a tumor-infiltrating T lymphocyte, a CD4+ T cell, a CD8+ T cell, or the combination thereof.