

CLAIMS

What is claimed is:

1. An antibody or antigen-binding fragment thereof, wherein the antibody or fragment thereof has specificity to a human Programmed death-ligand 1 (PD-L1) protein and comprises a heavy chain variable region (VH) comprising a VH CDR1, a VH CDR2, and a VH CDR3, and a light chain variable region (VL) comprising a VL CDR1, a VL CDR2, and a VL CDR3, wherein:
 - the VH CDR1 comprises the amino acid sequence of SEQ ID NO:37,
 - the VH CDR2 comprises the amino acid sequence of SEQ ID NO:46, 135, 136, 137, 143 or 144,
 - the VH CDR3 comprises the amino acid sequence of SEQ ID NO:63,
 - the VL CDR1 comprises the amino acid sequence of SEQ ID NO:76,
 - the VL CDR2 comprises the amino acid sequence of SEQ ID NO:83, and
 - the VL CDR3 comprises the amino acid sequence of SEQ ID NO:97.
2. The antibody or fragment thereof of claim 1, wherein:
 - the VH CDR1 comprises the amino acid sequence of SEQ ID NO:37,
 - the VH CDR2 comprises the amino acid sequence of SEQ ID NO:46,
 - the VH CDR3 comprises the amino acid sequence of SEQ ID NO:63,
 - the VL CDR1 comprises the amino acid sequence of SEQ ID NO:76,
 - the VL CDR2 comprises the amino acid sequence of SEQ ID NO:83, and
 - the VL CDR3 comprises the amino acid sequence of SEQ ID NO:97.
3. The antibody or fragment thereof of claim 1, wherein the VH comprises the amino acid sequence of SEQ ID NO:23, 124, 126, 127, 128, 130, 140, or 145, and the VL comprises the amino acid sequence of SEQ ID NO:24 or 125.

4. The antibody or fragment thereof of claim 1 or 2, wherein the VH comprises the amino acid sequence of SEQ ID NO:124 or a first amino acid sequence having at least 95% sequence identity to SEQ ID NO:124, and the VL comprises the amino acid sequence of SEQ ID NO:125 or a second amino acid sequence having at least 95% sequence identity to SEQ ID NO:125.
5. An antibody or antigen-binding fragment thereof, wherein the antibody or fragment thereof has specificity to a human Programmed death-ligand 1 (PD-L1) protein and comprises a heavy chain variable region (VH) comprising a VH CDR1, a VH CDR2, and a VH CDR3, and a light chain variable region (VL) comprising a VL CDR1, a VL CDR2, and a VL CDR3, wherein:
- the VH CDR1 comprises the amino acid sequence of SEQ ID NO:38 or 132,
 - the VH CDR2 comprises the amino acid sequence of SEQ ID NO:47, 133 or 134,
 - the VH CDR3 comprises the amino acid sequence of SEQ ID NO:57,
 - the VL CDR1 comprises the amino acid sequence of SEQ ID NO:72,
 - the VL CDR2 comprises the amino acid sequence of SEQ ID NO:84, and
 - the VL CDR3 comprises the amino acid sequence of SEQ ID NO:93.
6. The antibody or fragment thereof of claim 5, wherein the VH comprises the amino acid sequence of SEQ ID NO: 11, 121, 122 or 123 or a first amino acid sequence having at least 95% sequence identity to SEQ ID NO: 11, 121, 122 or 123, and the VL comprises the amino acid sequence of SEQ ID NO:12 or a second amino acid sequence having at least 95% sequence identity to SEQ ID NO:12.
7. An antibody or antigen-binding fragment thereof, wherein the antibody or fragment thereof has specificity to a human Programmed death-ligand 1 (PD-L1) protein and comprises a heavy chain variable region (VH) comprising a VH CDR1, a VH CDR2, and a VH CDR3,

and a light chain variable region (VL) comprising a VL CDR1, a VL CDR2, and a VL CDR3, wherein:

the VH CDR1 comprises the amino acid sequence of SEQ ID NO:37,

the VH CDR2 comprises the amino acid sequence of SEQ ID NO:46, 135, 136, 137, 143 or 144,

the VH CDR3 comprises the amino acid sequence of SEQ ID NO:63,

the VL CDR1 comprises the amino acid sequence of SEQ ID NO:71,

the VL CDR2 comprises the amino acid sequence of SEQ ID NO:83, and

the VL CDR3 comprises the amino acid sequence of SEQ ID NO:101, 138, or 139.

8. The antibody or fragment thereof of claim 7, wherein the VH comprises the amino acid sequence of SEQ ID NO:31, 124, 126, 127, 128, 130, 140, or 145 or a first amino acid sequence having at least 95% sequence identity to SEQ ID NO: 31, 124, 126, 127, 128, 130, 140, or 145, and the VL comprises the amino acid sequence of SEQ ID NO:32, 129 or 131 or a second amino acid sequence having at least 95% sequence identity to SEQ ID NO:32, 129 or 131.

9. The antibody or fragment thereof of any one of claims 1-8, further comprising a heavy chain constant region, a light chain constant region, an Fc region, or the combination thereof.

10. The antibody or fragment thereof of any one of claims 1-9, wherein the antibody or fragment thereof is a fully human antibody.

11. An antibody or antigen-binding 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 an amino acid sequence selected from SEQ ID NO:35-42 and variants thereof having one or two amino acid substitution therefrom,
a VH CDR2 comprising an amino acid sequence selected from SEQ ID NO:43-51 and variants thereof having one or two amino acid substitution therefrom,
a VH CDR3 comprising an amino acid sequence selected from SEQ ID NO:52-66 and variants thereof having one or two amino acid substitution therefrom,
a VL CDR1 comprising an amino acid sequence selected from SEQ ID NO:67-79 and variants thereof having one or two amino acid substitution therefrom,
a VL CDR2 comprising an amino acid sequence selected from SEQ ID NO:80-88 and variants thereof having one or two amino acid substitution therefrom, and
a VL CDR3 comprising an amino acid sequence selected from SEQ ID NO:89-102 and variants thereof having one or two amino acid substitution therefrom.

12. The antibody or fragment thereof of claim 11, wherein:
the VH CDR1 comprises an amino acid sequence selected from SEQ ID NO:37-38, 40 and 132,
the VH CDR2 comprises an amino acid sequence selected from SEQ ID NO:45-47, 49, 133-137 and 143-144,
the VH CDR3 comprises an amino acid sequence selected from SEQ ID NO:54-58 and 61-64,
the VL CDR1 comprises an amino acid sequence selected from SEQ ID NO:67, 70-73 and 75-77,
the VL CDR2 comprises an amino acid sequence selected from SEQ ID NO:80, 83-84 and 86, and
the VL CDR3 comprises an amino acid sequence selected from SEQ ID NO:89, 91-94, 96-99, 101 and 138-139.

13. An antibody or antigen-binding fragment thereof, wherein the antibody or fragment thereof has specificity to a human Programmed death-ligand 1 (PD-L1) protein and comprises a heavy chain variable region (VH) comprising a VH CDR1, a VH CDR2, and a VH CDR3, and a light chain variable region (VL) comprising a VL CDR1, a VL CDR2, and a VL CDR3, wherein the VH CDR1, VH CDR2, VH CDR3, VL CDR1, VL CDR2, and VL CDR3, respectively, comprise the amino acid sequences of:

SEQ ID NO:35, 43, 52, 67, 80, and 89;

SEQ ID NO:36, 44, 53, 68, 81, and 90;

SEQ ID NO:37, 45, 54, 69, 82, and 91;

SEQ ID NO:37, 46, 55, 70, 83, and 89;

SEQ ID NO:37, 46, 56, 71, 83, and 92;

SEQ ID NO:38, 47, 57, 72, 84, and 93;

SEQ ID NO:37, 46, 58, 73, 83, and 94;

SEQ ID NO:39, 48, 59, 74, 85, and 95;

SEQ ID NO:37, 46, 60, 67, 80, and 91;

SEQ ID NO:37, 46, 61, 75, 83, and 96;

SEQ ID NO:40, 49, 62, 67, 80, and 91;

SEQ ID NO:37, 46, 63, 76, 83, and 97;

SEQ ID NO:37, 46, 64, 71, 86, and 98;

SEQ ID NO:37, 45, 54, 77, 80, and 99;

SEQ ID NO:41, 50, 65, 78, 87, and 100;

SEQ ID NO:37, 46, 63, 71, 83, and 101; or

SEQ ID NO:42, 51, 66, 79, 88, and 102,

wherein each of the amino acid sequences optionally has an amino acid substitution.

14. A bispecific antibody comprising a first antigen binding fragment of any one of claims 1-13 and a second antigen binding fragment having specificity to an antigen that is not PD-L1.

15. A composition comprising the antibody or fragment thereof of any one of claims 1-14 and a pharmaceutically acceptable carrier.
16. One or more polynucleotide encoding the antibody or fragment thereof of any one of claims 1-14.
17. An isolated cell comprising one or more polynucleotide encoding the antibody or fragment thereof of any one of claims 1-14.
18. Use of the antibody or fragment thereof of any one of claims 1-14 or the composition of claim 15 for the preparation of a medicament for treating cancer or infection.
19. The use of claim 18, wherein the cancer is a solid tumor.
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. The use of claim 19, wherein the infection is viral infection, bacterial infection, fungal infection or infection by a parasite.

CLAIMS

What is claimed is:

1. An antibody or antigen-binding fragment thereof, wherein the antibody or fragment thereof has specificity to a human Programmed death-ligand 1 (PD-L1) protein and comprises a heavy chain variable region (VH) comprising a VH CDR1, a VH CDR2, and a VH CDR3, and a light chain variable region (VL) comprising a VL CDR1, a VL CDR2, and a VL CDR3, wherein:

the VH CDR1 comprises the amino acid sequence of SEQ ID NO:37,

the VH CDR2 comprises the amino acid sequence of SEQ ID NO:46, 135, 136, 137, 143 or 144,

the VH CDR3 comprises the amino acid sequence of SEQ ID NO:63,

the VL CDR1 comprises the amino acid sequence of SEQ ID NO:76,

the VL CDR2 comprises the amino acid sequence of SEQ ID NO:83, and

the VL CDR3 comprises the amino acid sequence of SEQ ID NO:97.

2. The antibody or fragment thereof of claim 1, wherein:

the VH CDR1 comprises the amino acid sequence of SEQ ID NO:37,

the VH CDR2 comprises the amino acid sequence of SEQ ID NO:46,

the VH CDR3 comprises the amino acid sequence of SEQ ID NO:63,

the VL CDR1 comprises the amino acid sequence of SEQ ID NO:76,

the VL CDR2 comprises the amino acid sequence of SEQ ID NO:83, and

the VL CDR3 comprises the amino acid sequence of SEQ ID NO:97.

3. The antibody or fragment thereof of claim 1, wherein the VH comprises the amino acid sequence of SEQ ID NO:23, 124, 126, 127, 128, 130, 140, or 145, and the VL comprises the amino acid sequence of SEQ ID NO:24 or 125.

4. The antibody or fragment thereof of claim 1 or 2, wherein the VH comprises the amino acid sequence of SEQ ID NO:124 or a first amino acid sequence having at least 95% sequence identity to SEQ ID NO:124, and the VL comprises the amino acid sequence of SEQ ID NO: 125 or a second amino acid sequence having at least 95% sequence identity to SEQ ID NO:125.
5. The antibody or fragment thereof of any one of claims 1-4, further comprising a heavy chain constant region, a light chain constant region, an Fc region, or the combination thereof.
6. The antibody or fragment thereof of any one of claims 1-5, wherein the antibody or fragment thereof is a fully human antibody.
7. A bispecific antibody comprising a first antigen binding fragment of any one of claims 1-6 and a second antigen binding fragment having specificity to an antigen that is not PD-L1.
8. A composition comprising the antibody or fragment thereof of any one of claims 1-7 and a pharmaceutically acceptable carrier.
9. One or more polynucleotide encoding the antibody or fragment thereof of any one of claims 1-7.
10. An isolated cell comprising one or more polynucleotide encoding the antibody or fragment thereof of any one of claims 1-7.
11. Use of the antibody or fragment thereof of any one of claims 1-7 or the composition of claim 8 for the preparation of a medicament for treating cancer.

12. The use of claim 11, wherein the cancer is a solid tumor.

13. The use of claim 11, 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.