

Summary

Aspects of the disclosure include isolated anti-PD-L1 antibodies, as well as compositions containing such antibodies, and methods of using the same in the treatment of diseases or conditions that are mediated by PD-L1 signaling.

In one aspect, the present disclosure provides an isolated anti-PD-L1 antibody, or an antigen-binding fragment thereof, comprising a heavy chain variable region (VH) and a light chain variable region (VL), wherein the antibody or antigen-binding fragment thereof comprises:

- (i) an HVR-H1 comprising the sequence of GFSLTSYDIS (SEQ ID NO: 4);
- (ii) an HVR-H2 comprising the sequence of VIWTGVGTN (SEQ ID NO: 5);
- (iii) an HVR-H3 comprising the sequence of DPYYYGMDY (SEQ ID NO: 6);
- (iv) an HVR-L1 comprising the sequence of RASQDISIWLS (SEQ ID NO: 1);
- (v) an HVR-L2 comprising the sequence of KASNLHT (SEQ ID NO: 2); and
- (vi) HVR-L3 comprising the sequence of LQSQSFPR (SEQ ID NO: 3).

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In a further aspect, the present disclosure provides an IgM, IgA, IgG/IgM or IgG/IgA antibody or antigen-binding fragment thereof comprising a modified J-chain comprising an extraneous binding moiety, wherein the antibody, or antigen-binding fragment, binds to a cell surface protein, and wherein the extraneous binding moiety comprises an anti-PD-L1 antibody or antigen-binding fragment thereof as disclosed herein.

In yet another aspect, the present disclosure provides a polynucleotide encoding a heavy chain and a light chain of an antibody or antigen-binding fragment thereof as disclosed herein.

In yet another aspect, the present disclosure provides a vector comprising the polynucleotide as disclosed herein.

In yet another aspect, the present disclosure provides a recombinant host cell comprising the polynucleotide or the vector as disclosed herein.

In yet another aspect, the present disclosure provides a method of producing an isolated anti-PD-L1 antibody, the method comprising:

culturing the host cell as disclosed herein; and

isolating the anti-PD-L1 antibody.

In yet another aspect, the present disclosure provides use of the antibody or antigen-binding fragment thereof as disclosed herein in the preparation of a medicament to inhibit the growth of a tumor cell in a subject in need of treatment, thereby (i) inhibiting growth or proliferation of the tumor cell, or (ii) inducing death of the tumor cell.

In some examples, an isolated anti-PD-L1 antibody, or an antigen-binding fragment thereof, comprises a heavy chain variable region that comprises: (i) an HVR-H1 sequence having at least about 99% sequence identity to the sequence of GFSLTSYDIS (SEQ ID NO: 4); (ii) an HVR-H2 sequence having at least about 99% sequence identity to the sequence of VIWTGVGTN (SEQ ID NO: 5); and (iii) an HVR-H3 sequence having at least about 99% sequence identity to the sequence of DPYYYGMDY (SEQ ID NO: 6). In some examples, the HVR-H1 sequence comprises the sequence of GFSLTSYDIS (SEQ ID NO: 4); the HVR-H2 sequence comprises the sequence of VIWTGVGTN (SEQ ID NO: 5); and the HVR-H3 sequence comprises the sequence of DPYYYGMDY (SEQ ID NO: 6). In some examples, an isolated anti-PD-L1 antibody further comprises a light chain variable region comprising at least one HVR sequence selected from the group consisting of: (i) HVR-L1 comprising at least about 99% sequence identity to the sequence of RASQDISIWLS (SEQ ID NO: 1); (ii) HVR-L2 comprising at least about 99% sequence identity to the sequence of KASNLHT

Claims

1. An isolated anti-PD-L1 antibody, or an antigen-binding fragment thereof, comprising a heavy chain variable region (VH) and a light chain variable region (VL), wherein the antibody or antigen-binding fragment thereof comprises:
 - (i) an HVR-H1 comprising the sequence of GFSLTSYDIS (SEQ ID NO: 4);
 - (ii) an HVR-H2 comprising the sequence of VIWTGVGTN (SEQ ID NO: 5);
 - (iii) an HVR-H3 comprising the sequence of DPYYYGMDY (SEQ ID NO: 6);
 - (iv) an HVR-L1 comprising the sequence of RASQDISIWLS (SEQ ID NO: 1);
 - (v) an HVR-L2 comprising the sequence of KASNLHT (SEQ ID NO: 2); and
 - (vi) HVR-L3 comprising the sequence of LQSQSFPR (SEQ ID NO: 3).
2. The antibody or antigen-binding fragment thereof of claim 1, wherein the VH comprises the amino acid sequence SEQ ID NO: 45 and the VL comprises the amino acid sequence SEQ ID NO: 46.
3. The antibody or antigen-binding fragment thereof claim 1, comprising a VH having at least 90% sequence identity to SEQ ID NO: 45 and a VL having at least 90% sequence identity to SEQ ID NO: 46.
4. The antibody or antigen-binding fragment thereof according to any one of claims 1 to 3, which is a chimeric antibody or a humanized antibody.
5. The antibody or antigen-binding fragment thereof of claim 1, comprising a VH having at least 90% sequence identity to any one of SEQ ID NOS: 36, 37, 38, 39, 40, 41 or 42 and a VL having at least 90% sequence identity to any one of SEQ ID NOS: 43 or 44.
6. The antibody or antigen-binding fragment thereof of claim 5, wherein the VH comprises SEQ ID NOS: 36, 37, 38, 39, 40, 41 or 42 and the VL comprises SEQ ID NOS: 43 or 44.
7. The antibody or antigen-binding fragment thereof according to any one of claims 1 to 6, which is monospecific.

8. The antibody or antigen-binding fragment thereof according to any one of claims 1-6, which is multispecific.
9. The antibody or antigen-binding fragment thereof according to claim 8, which is bispecific.
10. The antibody or antigen-binding fragment thereof according to claim 8 or claim 9, which binds to a PD-L1 protein and a cell surface protein.
11. The antibody or antigen-binding fragment thereof according to claim 10, wherein the cell surface protein is selected from the group consisting of: CD20, EGFR, HER2, CTLA-4, TIM3, LAG3, VISTA and TIGIT.
12. The antibody or antigen-binding fragment thereof according to any one of claims 1-11, wherein the antigen-binding fragment is selected from the group consisting of: Fab, Fab', F(ab)₂, F(ab')₂, Fv, scFv, and single domain antibody.
13. The antibody or antigen-binding fragment thereof according to any one of claims 1-12, wherein the antibody comprises a kappa light chain constant region or a lambda light chain constant region.
14. The antibody or antigen-binding fragment thereof according to any one of claims 1-13, wherein the antibody is an IgG, IgM, IgA, IgD, or IgE isotype.
15. The antibody or antigen-binding fragment thereof according to claim 14, wherein the antibody is an IgG isotype, and wherein the antibody is a subclass selected from the group consisting of: IgG1, IgG2, IgG3 and IgG4.
16. The antibody or antigen-binding fragment thereof according to claim 14, wherein the antibody is an IgM isotype.

17. The antibody or antigen-binding fragment thereof according to claim 14, wherein the antibody is an IgA isotype, and wherein the antibody is a subclass selected from the group consisting of: IgA1 and IgA2.
18. The antibody or antigen-binding fragment thereof according to claim 16 or claim 17, wherein the antibody further comprises a J-chain.
19. The antibody or antigen-binding fragment thereof according to any one of claims 1-13, wherein the antibody is an IgG/IgM or an IgG/IgA hybrid antibody comprising a J-chain.
20. The antibody or antigen-binding fragment thereof according to claim 18 or claim 19, wherein the J-chain is a modified J-chain comprising an extraneous binding moiety selected from the group consisting of: antibodies, antigen-binding fragments of antibodies, antibody-drug conjugates, antibody-like molecules, antigen-binding fragments of antibody-like molecules, soluble and membrane-bound proteins, ligands, and receptors.
21. The antibody or antigen-binding fragment thereof according to claim 20, wherein the extraneous binding moiety is an antigen-binding fragment of an antibody, and is selected from the group consisting of: Fab, Fab', F(ab)₂, F(ab')₂, Fv, scFv, and single domain antibody.
22. The antibody or antigen-binding fragment thereof according to claim 20 or claim 21, where the extraneous binding moiety antagonizes a T-cell inhibitory signaling pathway.
23. The antibody or antigen-binding fragment thereof according to claim 22, wherein the extraneous binding moiety binds to a cell surface protein selected from the group consisting of: CTLA-4, TIM3, LAG3, BTLA, VISTA and TIGIT.
24. The antibody or antigen-binding fragment thereof according to claim 20 or claim 21, wherein the extraneous binding moiety comprises an albumin protein, a fragment of an albumin protein, an albumin-binding peptide, an albumin-binding antibody fragment, an FcRn-binding peptide, an FcRn-binding antibody fragment or an Fc domain.

25. The antibody or antigen-binding fragment thereof according to claim 20 or claim 21, wherein the extraneous binding moiety binds to an effector cell.
26. The antibody or antigen-binding fragment thereof according to claim 25, wherein the effector cell is selected from the group consisting of: T-cells, natural killer (NK) cells, macrophages and neutrophils.
27. The antibody or antigen-binding fragment thereof according to claim 26, wherein the effector cell is a T-cell, and wherein the extraneous binding moiety binds to a CD3 on the T-cell.
28. An IgM, IgA, IgG/IgM or IgG/IgA antibody or antigen-binding fragment thereof comprising a modified J-chain comprising an extraneous binding moiety, wherein the antibody, or antigen-binding fragment, binds to a cell surface protein, and wherein the extraneous binding moiety comprises an anti-PD-L1 antibody or antigen-binding fragment thereof according to any one of claims 1-6.
29. The antibody or antigen-binding fragment thereof according to claim 28, wherein the cell surface protein is selected from the group consisting of: CD20, EGFR, HER2, CTLA-4, TIM3, LAG3, VISTA and TIGIT.
30. The antibody or antigen-binding fragment thereof according to any one of claims 1-29, wherein the antibody or antigen-binding fragment thereof antagonizes the interaction between a PD-L1 protein and a PD-1 protein.
31. A polynucleotide encoding a heavy chain and a light chain of an antibody or antigen-binding fragment thereof according to any one of the preceding claims.
32. A vector comprising the polynucleotide of claim 31.
33. A recombinant host cell comprising the polynucleotide of claim 31 or the vector of claim 32.

34. A method of producing an isolated anti-PD-L1 antibody, the method comprising:
culturing the host cell of claim 33; and
isolating the anti-PD-L1 antibody.
35. Use of the antibody or antigen-binding fragment thereof of any one of claims 1 to 30
in the preparation of a medicament to inhibit the growth of a tumor cell in a subject in need of
treatment, thereby (i) inhibiting growth or proliferation of the tumor cell, or (ii) inducing death
of the tumor cell.