

CLAIMS

1. An isolated antibody or an antigen-binding fragment thereof, comprising:
 - (a) a heavy chain variable domain (VH) comprising,
 - i. a heavy chain CDR1 comprising an amino acid sequence consisting of SEQ ID NO :72;
 - ii. a heavy chain CDR2 comprising an amino acid sequence consisting of SEQ ID NO : 84; and
 - iii. a heavy chain CDR3 comprising an amino acid sequence consisting of SEQ ID NO : 99, and
 - (b) a light chain variable domain (VL) comprising,
 - i. a light chain CDR1 comprising an amino acid sequence consisting of SEQ ID NO : 111 or SEQ ID NO:122;
 - ii. a light chain CDR2 comprising an amino acid sequence consisting of SEQ ID NO: 125; and
 - iii. a light chain CDR3 comprising an amino acid sequence consisting of SEQ ID NO: 137,wherein the antibody or antigen-binding fragment is capable of specifically binding to a PD-L1.
2. The isolated antibody or antigen-binding fragment thereof of claim 1, wherein the PD-L1 is human PD-L1.
3. The isolated antibody or antigen-binding fragment thereof of claim 1 or 2, wherein:
 - (1) the VH comprises the heavy chain CDR1, CDR2 and CDR3 sequences having the amino acid sequences of SEQ ID NOs: 72, 84 and 99, respectively, and the VL comprises the light chain CDR1, CDR2 and CDR3 sequences having the amino acid sequences of SEQ ID NOs: 111, 125 and 137, respectively; or
 - (2) the VH comprises the heavy chain CDR1, CDR2 and CDR3 sequences having the amino acid sequences of SEQ ID NOs: 72, 84 and 99, respectively, and the VL comprises the light chain CDR1, CDR2 and CDR3 sequences having the amino acid sequences of SEQ ID NOs: 122, 125 and 137, respectively.
4. The isolated antibody or antigen-binding fragment thereof of any one of claims 1-3, wherein the VH comprises an amino acid sequence that is at least 90% identical to a sequence selected from the group consisting of SEQ ID NOs: 2, 16, 17, 18, 19, and 20, and the VL comprises an amino acid sequence that is at least 90% identical to a sequence selected from the group consisting of SEQ ID NOs: 46, 57, 59, 60, 61, 65, 66, and 67.
5. The isolated antibody or antigen-binding fragment thereof of any one of claims 1-4, wherein the VH comprises the amino acid sequence of SEQ ID NO:16, 19, or 20, and the VL comprises the amino acid sequence of SEQ ID NO:65.
6. The isolated antibody or antigen-binding fragment thereof of any one of claims 1-5, wherein the VH is fused to a heavy chain constant region of an immunoglobulin; and/or the VL is fused to a light chain constant region (CL) of an immunoglobulin.

7. The isolated antibody or antigen-binding fragment thereof of any one of claims 1-6, wherein the K_D of the binding between the antibody or antigen-binding fragment thereof and the PD-L1 is 10^{-7} M to 10^{-12} M.
8. The isolated antibody or antigen-binding fragment thereof of any one of claims 1-7, being rodent, chimeric, partially humanized, or fully humanized.
9. The isolated antibody of claim 8, further comprising a constant domain of a human IgG1.
10. The isolated antibody of claim 9, comprising a heavy chain amino acid sequence of any one of SEQ ID NOs: 279, 293-297, 349, and 363-367, and a light chain amino acid sequence of any one of SEQ ID NOs: 323, 334, 336-338, and 342-344.
11. The isolated antibody or antigen-binding fragment thereof of any one of claims 1-10, further comprising a second antibody moiety, wherein the second antibody moiety is capable of specifically binding to a second antigen.
12. The isolated antibody or antigen-binding fragment thereof of claim 11, wherein the second antibody moiety is a Fab, a Fab', a (Fab')₂, an Fv, a single chain Fv (scFv), an scFv-scFv, a minibody, a diabody, a sdAb, or an antibody mimetic.
13. The isolated antibody or antigen-binding fragment thereof of claim 12, wherein the second antibody moiety is a sdAb.
14. The isolated antibody or antigen-binding fragment thereof of any one of claims 11-13, wherein the second antibody moiety is capable of specifically binding to CTLA-4, TIGIT, TIM-3, or LAG-3.
15. The isolated antibody or antigen-binding fragment thereof of claim 14, wherein the amino-terminus or carboxyl-terminus of the heavy chain or light chain of the isolated antibody or antigen-binding fragment thereof is fused to the carboxyl-terminus or amino-terminus of the sdAb capable of specifically binding to CTLA-4, TIGIT, TIM-3 or LAG-3.
16. The isolated antibody or antigen-binding fragment thereof of claim 15, wherein the isolated antibody or antigen-binding fragment thereof is fused via a peptide linker to the carboxyl-terminus or amino terminus of the sdAb capable of specifically binding to CTLA-4, TIGIT, TIM-3 or LAG-3.
17. The isolated antibody or antigen-binding fragment thereof of claim 15 or 16, wherein the isolated antibody or antigen-binding fragment thereof is fused to the sdAb capable of specifically binding to CTLA-4, TIGIT, TIM-3 or LAG-3 via a peptide linker having the amino acid sequence of one of SEQ ID NOs: 397-399.
18. A pharmaceutical composition comprising the isolated antibody or antigen-binding fragment thereof of any one of claims 1-17 and a pharmaceutical acceptable carrier.
19. The isolated antibody or antigen-binding fragment thereof of any one of claims 1-17 or the pharmaceutical composition of claim 18, for use in treating a cancer or a pathogenic infection.

20. Use of the isolated antibody or antigen-binding fragment thereof of any one of claims 1-17 or the pharmaceutical composition of claim 18, in the manufacture of a medicament for the treatment of cancer or a pathogenic infection in a subject in need thereof.
21. The isolated antibody or antigen-binding fragment thereof or pharmaceutical composition for use of claim 19, or the use of claim 20, wherein the cancer is a solid tumor.
22. The isolated antibody or antigen-binding fragment thereof or pharmaceutical composition for use of claim 19, or the use of claim 20, wherein the cancer is a solid tumor and the solid tumor is colon cancer.
23. An isolated nucleic acid encoding the isolated antibody or antigen-binding fragment of any one of claims 1-17.
24. A vector comprising the isolated nucleic acid of claim 23.