CLAIMS

1. An isolated antibody or antigen binding fragment thereof (AB) that specifically binds to a human PD-1, wherein the AB comprises

a VH CDR1 amino acid sequence comprising GFTFSGYAMS (SEQ ID NO: 653),

a VH CDR2 amino acid sequence comprising YISNSGGNAH (SEQ ID NO: 658),

a VH CDR3 amino acid sequence comprising EDYGTSPFVY (SEQ ID NO: 664),

a VL CDR1 amino acid sequence comprising an amino acid sequence selected from the group consisting of

RASESVDSYGISFMN (SEQ ID NO: 675), and

RASESVDAYGISFMN (SEQ ID NO: 676)

a VL CDR2 amino acid sequence comprising AASNQGS (SEQ ID NO: 678), and

a VL CDR3 amino acid sequence comprising QQSKDVPWT (SEQ ID NO: 683).

2. The antibody of claim 1, wherein the AB blocks the ability of a human PDL1 or a human PDL2 to bind to human PD1 with an EC_{50} of

0.1 nM to 10 nM, 0.1 nM to 5 nM, 0.1 nM to 3 nM, 0.1 nM to 2 nM, 0.1 nM to 1 nM, 0.1 nM to 0.5 nM, 0.1 nM to 0.25 nM,

0.25 nM to 10 nM, 0.25 nM to 5 nM, 0.25 nM to 3 nM, 0.25 nM to 2 nM, 0.25 nM to 1 nM, 0.25 nM to 0.5 nM,

0.5 nM to 10 nM, 0.5 nM to 5 nM, 0.5 nM to 3 nM, 0.5 nM to 2 nM, 0.5 nM to 1 nM,

1 nM to 10 nM, 1 nM to 5 nM, 1 nM to 3 nM, 1 nM to 2 nM,

2 nM to 10 nM, 2 nM to 5 nM, 2 nM to 3 nM,

3 nM to 10 nM, 3 nM to 5 nM, or

5 nM to 10 nM.

3. The antibody of claim 1 or 2, wherein the antigen binding fragment thereof is selected from the group consisting of a Fab fragment, a F(ab') 2 fragment, a scFv, a scAb, a dAb, a single domain heavy chain antibody, and a single domain light chain antibody.

4. A conjugated antibody comprising the antibody of any one of claims 1 to 3 conjugated to an agent.

5. The conjugated antibody of claim 4, wherein the agent has one or more of the following characteristics selected from the group consisting of:

(a) the agent is conjugated to the antibody via a linker;

(b) the agent is conjugated to the antibody via a cleavable linker;

(c) the agent is conjugated to the antibody via a non-cleavable linker;

(d) the agent is a detectable moiety; and

(e) the agent is a diagnostic agent.

6. A pharmaceutical composition comprising the antibody of any one of claims 1 to 3, or the conjugated antibody of claim 4 or 5 and a carrier.

7. A pharmaceutical composition comprising the antibody of any one of claims 1 to 3.

8. The pharmaceutical composition of claim 6 comprising an additional agent.

9. The pharmaceutical composition of claim 7 comprising an additional agent.

10. The pharmaceutical composition of claim 8, wherein the additional agent is a therapeutic agent.

11. The pharmaceutical composition of claim 9, wherein the additional agent is a therapeutic agent.

12. An isolated nucleic acid molecule encoding the antibody of any one of claims 1 to 3.

13. A vector comprising the isolated nucleic acid molecule of claim 12.

14. Use of an effective amount of the antibody of any one of claims 1 to 3, or the pharmaceutical composition of claims 7, 9, or 10 in the manufacture of a medicament for reducing binding of a ligand selected from the group consisting of PDLl or PDL2 to PD-1 on T cells, wherein the medicament is to be administered to a subject in need thereof.

15. Use of a therapeutically effective amount of the isolated antibody as in claim 1, or the pharmaceutical composition as in any of claims 7, 9, or 10 in the manufacture of a medicament for reducing binding of a ligand selected from the group consisting of PDLl or PDL2 to PD-1 on T cells, wherein the medicament is to be administered to a subject in need thereof.

16. Use of a therapeutically effective amount of the antibody of any one of claims 1 to 3 or the conjugated antibody of claim 4 or 5 or the pharmaceutical composition of any one of claims 7, 9, or 10 in the manufacture of a medicament for reducing immune suppression, wherein the medicament is to be administered to a subject in need thereof.

17. The use of claim 16, wherein the immune suppression is mediated by engagement of PD-1 on T cells to PDLl or PDL2 on tumor or other immune cells.

18. The use of any one of claims 14 to 17, wherein the use comprises administering an additional agent, wherein the additional agent is a therapeutic agent.

19. An effective amount of the antibody of any one of claims 1 to 3, or the pharmaceutical composition of claims 7, 9, or 10 for use in reducing binding of a ligand selected from the group consisting of PDLl or PDL2 to PD-1 on T cells, wherein the antibody or the pharmaceutical composition is to be administered to a subject in need thereof.

20. A therapeutically effective amount of the isolated antibody as in claim 1, or the pharmaceutical composition as in any of claims 7, 9, or 10 for use in reducing binding of a ligand selected from the group consisting of PDLl or PDL2 to PD-1 on T cells, wherein the isolated antibody or the pharmaceutical composition is to be administered to a subject in need thereof.

21. A therapeutically effective amount of the antibody of any one of claims 1 to 3 or the conjugated antibody of claim 4 or 5 or the pharmaceutical composition of any one of claims 7, 9, or 10 for use in reducing immune suppression, wherein the antibody or the conjugated antibody or the pharmaceutical composition is to be administered to a subject in need thereof.

22. A therapeutically effective amount of the antibody of any one of claims 1 to 3 or the pharmaceutical composition of any one of claims 7, 9, or 10 for use in treating, alleviating a symptom of, or delaying the progression of a cancer, wherein the antibody or the pharmaceutical composition is to be administered to a subject in need thereof.

23. Use of an effective amount of the antibody of any one of claims 1 to 3, or the pharmaceutical composition of claims 7, 9, or 10 in the manufacture of a medicament for reducing binding of a ligand selected from the group consisting of PDLl or PDL2 to PD-1 on T cells in a subject in need of reduction thereof.

24. Use of a therapeutically effective amount of the isolated antibody as in claim 1, or the pharmaceutical composition as in any of claims 7, 9, or 10 in the manufacture of a

medicament for reducing binding of a ligand selected from the group consisting of PDLl or PDL2 to PD-1 on T cells in a subject in need of reduction thereof.

25. Use of a therapeutically effective amount of the antibody of any one of claims 1 to 3 or the conjugated antibody of claim 4 or 5 or the pharmaceutical composition of any one of claims 7, 9, or 10 in the manufacture of a medicament for reducing immune suppression in a subject in need of reduction thereof.

26. The use of claim 25, wherein the immune suppression in a subject in need of reduction thereof is mediated by engagement of PD-1 on T cells to PDLl or PDL2 on tumor or other immune cells.

27. Use of a therapeutically effective amount of the antibody of any one of claims 1 to 3 or the pharmaceutical composition of any one of claims 7, 9, or 10 in the manufacture of a medicament for treating, alleviating a symptom of, or delaying the progression of a cancer.

28. The use of any one of claims 23 to 27, further comprising an additional agent, wherein the additional agent is a therapeutic agent.

29. The antibody of claim 1, for use in therapy.