

Claims:

1. An antibody, or antigen binding fragment, which is capable of binding to PD-1, optionally isolated, comprising:

5 (i) at least one light chain variable region incorporating the following CDRs:

LC-CDR1:	SGSSSNIKFNSVN	(SEQ ID NO:25)
LC-CDR2:	SNNQRPS	(SEQ ID NO:26)
LC-CDR3:	ASWDDYLRGTV	(SEQ ID NO:29); and

10 at least one heavy chain variable region incorporating the following CDRs:

HC-CDR1:	SYGMH	(SEQ ID NO:89) or
	GFTFSSYGMH	(SEQ ID NO:39)
HC-CDR2:	VISYDGSNKYYADSVKG	(SEQ ID NO:40)
HC-CDR3:	DYGAGPYYYGMDV	(SEQ ID NO:43); or

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(ii) at least one light chain variable region incorporating the following CDRs:

LC-CDR1:	SGSSSNIKFNSVN	(SEQ ID NO:25)
LC-CDR2:	SNNQRPS	(SEQ ID NO:26)
LC-CDR3:	ASWDDYYYGTI	(SEQ ID NO:28); and

20 at least one heavy chain variable region incorporating the following CDRs:

HC-CDR1:	SYGMH	(SEQ ID NO:89) or
	GFTFSSYGMH	(SEQ ID NO:39)
HC-CDR2:	VISYDGSNKYYADSVKG	(SEQ ID NO:40)
HC-CDR3:	DLGAGPYYYGKDV	(SEQ ID NO:42).

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2. The antibody or antigen binding fragment of claim 1, comprising a heavy chain variable region sequence and a light chain variable region sequence, wherein:

the heavy chain variable region sequence has at least 70% sequence identity to the sequence of SEQ ID NO:15 or 14 (Figure 2), and

30 the light chain variable region sequence has at least 70% sequence identity to the sequence of SEQ ID NO:3 or 2 (Figure 1).

3. The antibody, or antigen binding fragment, of claim 1 or claim 2, wherein the antibody or antigen binding fragment specifically binds human or rhesus PD-1 over other members of the CD28 family.

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4. The antibody, or antigen binding fragment, of any one of claims 1 to 3, wherein the antibody or antigen binding fragment is effective to restore T-cell function in T-cells exhibiting T-cell exhaustion or T-cell anergy.

5. An antibody or antigen binding fragment, optionally isolated, which is capable of binding to PD-1, which is a bispecific antibody or a bispecific antigen binding fragment comprising (i) an antigen binding fragment according to any of one of claims 1 to 4, and (ii) an antigen binding domain which is capable of binding to a target protein other than PD-1.

6. The antibody, or antigen binding fragment, of claim 5, wherein the antigen binding domain which is capable of binding to a target protein other than PD-1 is capable of binding to one of TIM-3, LAG3, ICOS, CTLA4, BTLA or CD28.

7. An *in vitro* complex, optionally isolated, comprising an antibody, or antigen binding fragment, according to any one of claims 1 to 6 bound to PD-1.

8. A composition comprising the antibody or antigen binding fragment of any one of claims 1 to 6 and at least one pharmaceutically-acceptable carrier.

9. An isolated nucleic acid encoding the antibody or antigen binding fragment of any of one of claims 1 to 6.

10. A vector comprising the nucleic acid of claim 9.

11. A host cell comprising the vector of claim 10.

12. A method for making an antibody, or antigen binding fragment of any of one of claims 1 to 6 comprising culturing the host cell of claim 11 under conditions suitable for the expression of a vector encoding the antibody or antigen binding fragment, and recovering the antibody or antigen binding fragment.

13. An antibody or antigen binding fragment according to any of one of claims 1 to 6 for use in therapy, or in a method of medical treatment.

14. An antibody or antigen binding fragment according to any of one of claims 1 to 6 for use in the treatment of a T-cell dysfunctional disorder.

5 15. An antibody or antigen binding fragment or polypeptide according to any of one of claims 1 to 6 for use in the treatment of cancer.

16. An antibody or antigen binding fragment according to any of one of claims 1 to 6 for use in the treatment of an infectious disease.

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17. Use of an antibody or antigen binding fragment according to any of one of claims 1 to 6 in the manufacture of a medicament for use in the treatment of a T-cell dysfunctional disorder.

15 18. Use of an antibody or antigen binding fragment according to any of one of claims 1 to 6 in the manufacture of a medicament for use in the treatment of cancer.

19. Use of an antibody or antigen binding fragment according to any of one of claims 1 to 6 in the manufacture of a medicament for use in the treatment of an infectious
20 disease.

20. A method, *in vitro*, of enhancing T-cell function comprising administering an antibody or antigen binding fragment according to any one of claims 1 to 6 to a dysfunctional T-cell.

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21. A method comprising contacting a sample containing, or suspected to contain, PD-1 with an antibody or antigen binding fragment according to any one of claims 1 to 6 and detecting the formation of a complex of antibody, or antigen binding fragment, and PD-1.

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22. A method comprising contacting, *in vitro*, a sample from the subject with an antibody, or antigen binding fragment, according to any one of claims 1 to 6 and detecting the formation of a complex of antibody, or antigen binding fragment, and PD-1.

23. A method of selecting or stratifying a subject for treatment with PD-1 targeted agents, the method comprising contacting, *in vitro*, a sample from the subject with an antibody, or antigen binding fragment, according to any one of claims 1 to 6 and detecting the formation of a complex of antibody, or antigen binding fragment, and PD-1.
24. Use of an antibody, or antigen binding fragment, according to any one of 1 to 6 for the detection of PD-1 *in vitro*.
25. Use of an antibody, or antigen binding fragment, according to any one of 1 to 6 as an *in vitro* diagnostic agent.
26. A method for expanding a population of T cells, wherein T cells are contacted *in vitro* or *ex vivo* with an antibody or antigen binding fragment according to any one of claims 1 to 6.