## CLAIMS

1. An anti-PD-1 monoclonal antibody, wherein the anti-PD-1 monoclonal antibody is DFPD1-10 that consists of a light chain having three complementarity determining regions (CDRs) which are named as LCDR1, LCDR2 and LCDR3, and a heavy chain having three complementarity determining regions which are named as HCDR1, HCDR2 and HCDR3; the LCDR1 comprises SEQ ID NO. 24; the LCDR2 comprises SEQ ID NO. 30; the LCDR3 comprises SEQ ID NO. 37; the HCDR1 comprises SEQ ID NO. 39; the HCDR2 comprises SEQ ID NO. 41; the HCDR3 comprises a peptide whose amino acid sequence is shown as SEQ ID NO. 43.

2. The anti-PD-1 monoclonal antibody according to claim 1, wherein the light chain contains a light chain variable region as defined by SEQ ID NO. 11.

3. The anti-PD-1 monoclonal antibody according to claim 1 or 2, wherein the heavy chain contains a heavy chain variable region as defined by SEQ ID NO. 2.

4. A polynucleotide or combination of polynucleotides, wherein a polynucleotide sequence or the combination encodes the complementarity determining regions as defined in claim 1.

5. A recombinant DNA expression vector, wherein the recombinant DNA expression vector contains the polynucleotide sequence or combination encoding the complementarity determining regions of claim 4.

6. The recombinant DNA expression vector according to claim 5, wherein the recombinant DNA expression vector is transfected into a host cell, the host cell being a prokaryotic cell.

7. The recombinant DNA expression vector according to claim 5, wherein the recombinant DNA expression vector is transfected into a host cell, the host cell being a yeast.

8. The recombinant DNA expression vector according to claim 5, wherein the recombinant DNA expression vector is transfected into a host cell, a host cell is an insect cell.

9. The recombinant DNA expression vector according to claim 5, wherein the recombinant DNA expression vector is transfected into a host cell, the host cell being a mammalian

cell.

10. The anti-PD-1 monoclonal antibody according to any one of claims 1 to 3, wherein the anti-PD-1 monoclonal antibody is a human antibody; the heavy chain having a constant region that is IgG1; the light chain having a constant region that is Cκ or Cλ.

11. The anti-PD-1 monoclonal antibody according to any one of claims 1 to 3, wherein the anti-PD-1 monoclonal antibody is a human antibody; the heavy chain having a constant region that is IgG2; the light chain having a constant region that is Cκ or Cλ.

12. The anti-PD-1 monoclonal antibody according to any one of claims 1 to 3, wherein the anti-PD-1 monoclonal antibody is a human antibody; the heavy chain having a constant region that is IgG3; the light chain having a constant region that is Cκ or Cλ.

13. The anti-PD-1 monoclonal antibody according to any one of claims 1 to 3, wherein the anti-PD-1 monoclonal antibody is a human antibody; the heavy chain having a constant region that is IgG4; the light chain having a constant region that is Cκ or Cλ.

14. A single-chain antibody, a single domain antibody, a bi-specific antibody, or a drug-conjugated antibody, comprising LCDR1, LCDR2, LCDR3, HCDR1, HCDR2, and HCDR3 complementarity determining regions as defined in claim 1.

15. A drug comprising the anti-PD-1 monoclonal antibody as defined in claim 1.

16. A detection reagent comprising an antibody or antigen-binding fragment thereof having LCDR1, LCDR2, LCDR3, HCDR1, HCDR2, and HCDR3 complementarity determining regions as defined in claim 1.

17. Use of the antibody of any one of claims 1-3 in the manufacture of a medicament for the treatment of tumors.

18. Use of the antibody of any one of claims 1-3 in the manufacture of a medicament for the treatment of solid tumors.

19. A use of the antibody of any one of claims 1-3 in the manufacture of a medicament for treating tumors.

20. A use of the antibody of any one of claims 1-3 in the manufacture of a medicament for

treating solid tumors.

21. A kit comprising an antibody comprising the complementarity determining regions as defined in claim 1, and instructions for use thereof.

22. A host cell transfected with recombinant DNA expression vector of claim 5, wherein the host cell comprises a prokaryotic cell, yeast, or mammalian cell.

23. A kit comprising the detection agent of claim 16, and instructions for use thereof.