

Claims:

1. An programmed death ligand 1(PDL1)-binding molecule, which can specifically bind to PDL1 and consists of an amino acid sequence of A-L-B, wherein A represents an immunoglobulin single variable domain, L is absent or represents an amino acid linker, and B represents an human immunoglobulin Fc region;

wherein said immunoglobulin single variable domain consists of an amino acid sequence selected from SEQ ID NOs:1-6;

said PDL1- binding molecule is capable of forming homodimers via said human immunoglobulin Fc region.

2. The PDL1-binding molecule of claim 1, wherein said immunoglobulin Fc region is a Fc region of human IgG1, IgG2, IgG3 or IgG4.

3. The PDL1-binding molecule of claim 1, wherein said immunoglobulin Fc region is mutated to remove ADCC and CDC activities.

4. The PDL1-binding molecule of claim 1, wherein the sequence of said immunoglobulin Fc region is selected from SEQ ID NOs:7-9.

5. The PDL1-binding molecule of any one of claims 1-4, wherein the linker is 1-20 amino acids in length.

6. The PDL1-binding molecule of any one of claims 1-5, which consists of an amino acid sequence selected from SEQ ID NOs:10-27.

7. The PDL1-binding molecule of any one of claims 1-6, which has at least one of the following features:

(a) binding to human PD-PDL1 with a KD of less than 1×10^{-7} M;;

(b) blocking the interaction between PDL1 and PD-1;

(c) enhancing activation of PBMC and/or T cells;

(d) inhibiting tumor growth.

8. The PDL1-binding molecule of any one of claims 1-7, which binds to PDL1 with a KD of less than 1×10^{-7} M, preferably less than 1×10^{-8} M, more

preferably less than 1×10^{-9} M, more preferably less than 1×10^{-10} M, and even more preferably less than 1×10^{-11} M.

9. A nucleic acid molecule encoding for the PDL1-binding molecule of any one of claims 1-8.

5 10. An expression vector, which comprises the nucleic acid molecule of claim 9 operably linked to an expression regulation element.

11. A host cell, which comprises the nucleic acid molecule of claim 9 or is transformed with the expression vector of claim 10, and is capable of expressing said PDL1-binding molecule.

10 12. A method for producing the PDL1-binding molecule of any one of claims 1-8, which comprises:

a) culturing the host cell of claim 11 under conditions that allow expression of the PDL1-binding molecule;

b) recovering the PDL1-binding molecule expressed by the host cell from
15 the culture of step a); and

c) optionally further purifying and/or modifying the PDL1-binding molecule obtained from step b).

13. A pharmaceutical composition comprising the PDL1-binding molecule of any one of claims 1-8, and a pharmaceutically acceptable carrier.

20 14. Use of the PDL1-binding molecule of any one of claims 1-8 or the pharmaceutical composition of claim 13 for the manufacture and/or preparation of a medicament or composition for preventing and/or treating cancer in a subject.

15. The use of claim 14, wherein said medicament or composition comprising additional anti-tumor therapeutic means.

16. The use of claim 15, wherein said additional anti-tumor therapeutic means comprises chemotherapy, radiotherapy or antibody against other tumor-specific antigen.

17. The use of claim 16, wherein said antibody against other tumor-specific antigen comprises anti-EGFR antibody, anti-EGFR variant antibody, anti-VEGFA antibody, anti-HER2 antibody, or anti-CMET antibody.

18. The use of claim 17, wherein said antibody against other tumor-specific antigen is a monoclonal antibody.

19. The use of any one of claims 14-18, wherein said cancer is selected from the group consisting of lung cancer, ovarian cancer, colon cancer, rectal cancer, melanoma, renal cancer, bladder cancer, breast cancer, liver cancer, lymphoma, hematological malignancy, head and neck cancer, glioma, gastric cancer, nasopharyngeal cancer, laryngeal cancer, cervical cancer, corpus carcinoma, osteosarcoma.

20. Use of the PDL1-binding molecule of any one of claims 1-8 or the pharmaceutical composition of claim 13 for the manufacture and/or preparation of a medicament or composition for preventing and/or treating infectious disease in a subject.

21. The use of claim 20, wherein said infectious disease is caused by a pathogen selected from the group consisting of HIV, hepatitis virus, influenza virus, herpes virus, Giardia, plasmodium, Leishmania, Staphylococcus aureus, Pseudomonas aeruginosa.

22.

Use of the PDL1-binding molecule of any one of claims 1-8 or the pharmaceutical composition of claim 13 for the manufacture and/or preparation of a medicament or composition for preventing and/or treating chronic inflammatory disease in a subject.

23. The use of claim 22, wherein said chronic inflammatory disease is T-cell mediated chronic inflammatory mucocutaneous disease.

24. Use of the PDL1-binding molecule of any one of claims 1-8 or the pharmaceutical composition of claim 13 in preparation of a medicament for preventing and/or treating cancer, infectious disease or chronic inflammatory disease.