Claims

1. An antibody or antigen binding unit thereof that specifically binds to claudin 18A2, wherein,

(a) HCDR1 is SEQ ID NO:31, HCDR2 is SEQ ID NO:32, HCDR3 is SEQ ID NO:33, LCDR1 is SEQ ID NO:34, LCDR2 is SEQ ID NO:35, and LCDR3 is SEQ ID NO:36;

(b) HCDR1 is SEQ ID NO:37, HCDR2 is SEQ ID NO:38, HCDR3 is SEQ ID NO:39, LCDR1 is SEQ ID NO:40, LCDR2 is SEQ ID NO:41, and LCDR3 is SEQ ID NO:42;

(c) HCDR1 is SEQ ID NO:43, HCDR2 is SEQ ID NO:44, HCDR3 is SEQ ID NO:45, LCDR1 is SEQ ID NO:46, LCDR2 is SEQ ID NO:47, and LCDR3 is SEQ ID NO:48;

(d) HCDR1 is SEQ ID NO:49, HCDR2 is SEQ ID NO:50, HCDR3 is SEQ ID NO:51, LCDR1 is SEQ ID NO:52, LCDR2 is SEQ ID NO:53, and LCDR3 is SEQ ID NO:54;

(e) HCDR1 is SEQ ID NO:31, HCDR2 is SEQ ID NO:83, HCDR3 is SEQ ID NO:33, LCDR1 is SEQ ID NO:34, LCDR2 is SEQ ID NO:35, and LCDR3 is SEQ ID NO:36;

(f) HCDR1 is SEQ ID NO:31, HCDR2 is SEQ ID NO:84, HCDR3 is SEQ ID NO:33, LCDR1 is SEQ ID NO:34, LCDR2 is SEQ ID NO:35, and LCDR3 is SEQ ID NO: 36; or

(g) HCDR1 is SEQ ID NO:49, HCDR2 is SEQ ID NO:85, HCDR3 is SEQ ID NO:51, LCDR1 is SEQ ID NO:52, LCDR2 is SEQ ID NO:53, and LCDR3 is SEQ ID NO: 54.

2. The antibody or antigen binding unit of claim 1, comprising a heavy chain variable region (VH) and a light chain variable region (VL), wherein

VH comprises an amino acid sequence of SEQ ID NO:3, SEQ ID NO:7, SEQ ID NO:11, SEQ ID NO:15, SEQ ID NO:17, SEQ ID NO:19, SEQ ID NO:23, SEQ ID NO:27 or SEQ ID NO:29; and

VL comprises an amino acid sequence of SEQ ID NO:1, SEQ ID NO:5, SEQ ID NO:9, SEQ ID NO:13, SEQ ID NO:21 or SEQ ID NO:25.

3. The antibody or antigen binding unit of claim 2, wherein:

(a) VH comprises an amino acid sequence of SEQ ID NO:3 and VL comprises an amino acid sequence of SEQ ID NO:1;

(b) VH comprises an amino acid sequence of SEQ ID NO:7 and VL comprises an amino acid sequence of SEQ ID NO:5;

(c) VH comprises an amino acid sequence of SEQ ID NO:11 and VL comprises an amino acid sequence of SEQ ID NO:9;

(d) VH comprises an amino acid sequence of SEQ ID NO:15 and VL comprises an amino acid sequence of SEQ ID NO:13;

(e) VH comprises an amino acid sequence of SEQ ID NO:17 and VL comprises an amino acid sequence of SEQ ID NO:1;

(f) VH comprises an amino acid sequence of SEQ ID NO:19 and VL comprises an amino acid sequence of SEQ ID NO:1;

(g) VH comprises an amino acid sequence of SEQ ID NO:23 and VL comprises an amino acid sequence of SEQ ID NO:21;

(h) VH comprises an amino acid sequence of SEQ ID NO:27 and VL comprises an amino acid sequence of SEQ ID NO:25; or

(i) VH comprises an amino acid sequence of SEQ ID NO:29 and VL comprises an amino acid sequence of SEQ ID NO:25.

4. The antibody or antigen binding unit of any one of claims 1-3, which is a humanized antibody, a chimeric antibody, a fully humanized antibody, a monoclonal antibody, a single chain antibody, a multivalent antibody, a chimeric antigen receptor, an scFv, an Fv, a Fab, or a F(ab')2.

5. The antibody of any one of claims 1-4, having

(a) a heavy chain comprising an amino acid sequence of SEQ ID NO:63 and a light chain comprising an amino acid sequence of SEQ ID NO:65;

(b) a heavy chain comprising an amino acid sequence of SEQ ID NO:59 and a light chain comprising an amino acid sequence of SEQ ID NO:61; or

(c) a heavy chain comprising an amino acid sequence of SEQ ID NO:67 and a light chain comprising an amino acid sequence of SEQ ID NO:65.

6. A pharmaceutical composition comprising the antibody or antigen binding unit of any one of claims 1-5, and a pharmaceutically acceptable carrier.

7. A nucleic acid encoding the antibody or antigen binding unit of any one of claims 1-5.

8. An expression vector comprising the nucleic acid of claim 7.

9. A host cell comprising the expression vector of claim 8.

10. A method for producing an antibody or antigen binding unit that specifically binds to claudin 18A2, comprising culturing the host cell of claim 9 under suitable conditions, and obtaining the product expressed by the host cell.

11. A method for preparing an anti-claudin 18A2 targeting drug, an anti-claudin 18A2 antibody-drug conjugate, a multifunctional anti-claudin 18A2 antibody, a reagent for diagnosing a tumor expressing claudin 18A2, or an anti claudin 18A2 chimeric antigen receptor modified immune cell, wherein the method comprises providing the antibody or antigen binding unit of claim 1 and incorporating said antibody or antigen binding unit into the claudin 18A2 targeting drug, the anti-claudin 18A2 antibody-drug conjugate, the multifunctional anti-claudin 18A2 antibody, the reagent for diagnosing a tumor expressing claudin 18A2, or the anti claudin 18A2 chimeric antigen receptor modified immune cell.

12. A chimeric antigen receptor comprising the following sequentially linked components: the antibody or antigen binding unit of any one of claims 1-5, a transmembrane region, and an intracellular signal region.

13. The chimeric antigen receptor of claim 12, wherein the intracellular signal region is selected from: an intracellular signal region sequence of CD3ζ, FcεRIγ, CD27, CD28, CD137, CD134, MyD88, CD40, and combinations thereof; and/or the transmembrane region comprises a transmembrane region of CD8 or CD28.

14. A nucleic acid encoding the chimeric antigen receptor of any one of claims 12-13.

15. An expression vector comprising the nucleic acid of claim 14.

16. A virus comprising the vector of claim 15.

17. A chimeric antigen receptor-modified immune cell having the chimeric antigen receptor of any one of claims 12-13 expressed on the surface.

18. The chimeric antigen receptor-modified immune cell of claim 17, wherein the immune cell is selected from a T lymphocyte, a NK cell, and a NKT lymphocyte.

19. The chimeric antigen receptor-modified immune cell of claim 18, further comprising:

(a) an encoding sequence for an exogenous cytokine;

(b) another expressed chimeric antigen receptor which does not contain CD3ζ but contains an intracellular signal domain of CD28, an intracellular signal domain of CD137, or a combination of the both;

(c) an expressed chemokine receptor;

(d) an expressed siRNA which can reduce expression of PD-1;

(e) an expressed protein which can block PD-L1;

(f) a knock-out of endogenous PD-1 in the immune cell by gene editing techniques;

(g) an expressed safety switch; or

(h) an expressed Type I interferon.

20. A multifunctional immunoconjugate comprising:

an antibody or antigen binding unit of any one of claims 1-5; and

a functional molecule linked thereto, wherein the functional molecule is selected from a molecule targeting a surface marker on a tumor, a tumor-inhibiting molecule, a molecule targeting a surface marker of an immune cell, and a detectable label.

21. The multifunctional immunoconjugate of claim 20, which is bifunctional and wherein the function molecule is a molecule targeting a surface marker of an immune cell that is a T cell.

22. A nucleic acid encoding the multifunctional immunoconjugate of claim 20 or claim 21.

23. A kit comprising:

a container, and

the antibody or antigen binding unit of any one of claims 1-5.

24. The composition of claim 6, further comprising a Type I interferon.

25. The antibody or antigen binding unit of any one of claims 1-5 for use as a medicament.

26. Use of the antibody or antigen binding unit of any one of claims 1-5 for the preparation of a medicament for treating a tumor, wherein the tumor is associated with gastric cancer.