

CLAIMS

1. A composition comprising an antibody, wherein the antibody binds to an epitope that is glycan-shielded on non-cancerous cells but exposed on cancer cells.
2. The composition of claim 1, wherein the antibody binds to CD24.
3. The composition of claim 1, wherein the antibody binds to a peptide comprising the sequence set forth in SEQ ID NO: 48.
4. The composition of claim 1, wherein the antibody comprises a heavy chain variable region comprising the sequence set forth in SEQ ID NO: 1, and a light chain variable region comprising the sequence set forth in SEQ ID NO: 2.
5. The composition of claim 1, wherein the antibody comprises a heavy chain variable region comprising any one of the sequences set forth in SEQ ID NOS: 3-10, and a light chain variable region comprising any one of the sequences set forth in SEQ ID NOS: 11-16.
6. The composition of claim 5, wherein the antibody comprises a heavy chain variable region comprising the sequence set forth in SEQ ID NO: 6 and a light chain variable region comprising the sequence set forth in SEQ ID NO: 16.
7. The composition of claim 1, wherein the antibody comprises a heavy chain variable region comprising any one of the sequences set forth in SEQ ID NOS: 29-32, and a light chain variable region comprising any one of the sequences set forth in SEQ ID NOS: 33-36.
8. The composition of claim 7, wherein the antibody comprises a heavy chain variable region comprising the sequence set forth in SEQ ID NO: 30 and a light chain variable region comprising the sequence set forth in SEQ ID NO: 35.
9. The composition of claim 7, wherein the antibody comprises a heavy chain variable region comprising the sequence set forth in SEQ ID NO: 31 and a light chain variable region comprising the sequence set forth in SEQ ID NO: 35.
10. A bi-specific antibody comprising a first antibody domain comprising the composition of any one of claims 1-9, and a second antibody domain comprising a second antibody or antigen binding fragment thereof.

11. The bi-specific antibody of claim 10, wherein the second antibody domain attracts immune effector T cells to the cancer cells for cancer immunotherapy.
12. The bi-specific antibody of claim 10, wherein the second antibody or antigen binding fragment thereof binds to CD3.
13. The bi-specific antibody of claim 10, comprising the sequences set forth in SEQ ID NOS: 17 and 18.
14. The bi-specific antibody of claim 10, comprising any one of the sequences set forth in SEQ ID NOS: 23-27 and 37-41.
15. The bi-specific antibody of claim 10, wherein the second antibody or antigen binding fragment thereof binds TCR- α chain, TCR- β chain, TCR- γ chain, or TCR- δ chain.
16. The antibody or bi-specific antibody of any one of claims 1-15, wherein the antibody or bi-specific antibody has antibody-mediated cellular cytotoxicity (ADCC) activity.
17. The antibody or bi-specific antibody of claim 16, wherein the antibody or bi-specific antibody is engineered to have enhanced ADCC activity.
18. The antibody or bi-specific antibody of any one of claims 1-17 wherein the antibody or bi-specific antibody has antibody-mediated cellular phagocytosis (ADCP) activity.
19. The antibody or bi-specific antibody of claim 18, wherein the antibody or bi-specific antibody is engineered to have enhanced ADCP activity.
20. A chimeric antigen receptor, comprising a single chain antibody comprising the composition of any one of claims 4-9.
21. The chimeric antigen receptor of claim 20, comprising the sequence set forth in SEQ ID NO: 28.
22. A composition comprising the antibody, bi-specific antibody, or chimeric antigen receptor of any one of claims 1-21, and a second anti-cancer therapy.
23. A method of treating cancer in a patient in need thereof, comprising administering the antibody, bi-specific antibody, chimeric antigen receptor, or composition of any one of claims 1-22 to the patient.

24. The method of claim 23, wherein the cancer is lung cancer, ovarian cancer, breast cancer, liver cancer, brain cancer, cervical cancer, renal cancer, testicular cancer, prostate cancer, or neuroblastoma.

25. A method of treating adverse effects associated with a therapy comprising anti-CD24 antibodies or cells expressing CD24-binding receptors in a patient in need thereof, comprising administering a composition comprising the sequence set forth in SEQ ID NO: 48 to the patient.

26. A method of treatment or prophylaxis of cancer in a patient in need thereof, comprising administering a composition comprising SEQ ID NO: 48 to the patient.

27. A method of diagnosis of malignant tissues or metastatic lesions, comprising use of the antibody of claim 1.

28. A method of identifying circulating cancer cells, comprising use of the antibody of claim 1.

29. Use of the antibody, bi-specific antibody, chimeric antigen receptor, or composition of any one of claims 1-22 in the manufacture of a medicament for treating cancer.

30. The method of claim 29, wherein the cancer is lung cancer, ovarian cancer, breast cancer, liver cancer, brain cancer, cervical cancer, ovarian cancer, renal cancer, testicular cancer, prostate cancer, or neuroblastoma.

31. Use of a composition comprising the sequence set forth in SEQ ID NO: 48 in the manufacture of a medicament for treating adverse effects associated with therapeutic use of anti-CD24 antibodies or cells expressing CD24-binding receptors.

32. Use of a composition comprising SEQ ID NO: 48 in the manufacture of a medicament for treatment or prophylaxis of cancer.