CLAIMS

1. An isolated antibody that binds to sialyl(α2,6)N-acetylgalactosamine (STn), wherein the antibody comprises a heavy chain variable domain (VH) comprising an amino acid sequence selected from SEQ ID NOs: 240, 237-239, and 241, and a light chain variable domain (VL) comprising an amino acid sequence selected from SEQ ID NOs: 235 and 236.

2. The isolated antibody of claim 1, wherein the antibody comprises a VH comprising the amino acid sequence of SEQ ID NO: 240 and a VL comprising the amino acid sequence of SEQ ID NO: 235.

3. The isolated antibody of claim 1 or claim 2, wherein the antibody comprises a human IgG1, IgG2a, IgG2b, IgG2c, IgG3, or IgG4 constant region.

4. The isolated antibody of claim 1 or claim 2, wherein the antibody comprises a human IgG1 constant region.

5. The isolated antibody of any one of claims 1-4, wherein the antibody binds to cell-associated STn with a half maximal effective concentration (EC50) of from about 0.01 nM to about 30 nM.

6. A pharmaceutical composition comprising the antibody of any one of claims 1-5 and at least one pharmaceutically acceptable excipient.

7. An isolated nucleic acid that encodes an antibody of any one of claims 1-5.

8. The isolated nucleic acid of claim 7, wherein the antibody comprises a VH comprising the amino acid sequence of SEQ ID NO: 240 and a VL comprising the amino acid sequence of SEQ ID NO: 235.

9. An isolated host cell that comprises the nucleic acid of claim 7 or claim 8.

10. An isolated host cell that expresses the antibody of any one of claims 1-5.

11. A method of producing an antibody that binds to sialyl(α2,6)N-acetylgalactosamine (STn), comprising culturing the host cell of claim 9 or claim 10 under conditions suitable for expressing the antibody.

12. The method of claim 11, further comprising isolating the antibody.

13. The antibody of any one of claims 1-5 or the pharmaceutical composition of claim 6 for use in a method of treating cancer in a subject.

14. The antibody or pharmaceutical composition for use of claim 13, wherein the antibody comprises a VH comprising the amino acid sequence of SEQ ID NO: 240 and a

VL comprising the amino acid sequence of SEQ ID NO: 235.

15. The antibody or pharmaceutical composition for use of claim 13 or claim 14, wherein the cancer is selected from breast cancer, colon cancer, pancreatic cancer, lung cancer, cervical cancer, ovarian cancer, stomach cancer, prostate cancer, and liver cancer.

16. The antibody of any one of claims 1-5 for use in a method of selecting a subject with cancer for treatment with an anti-STn antibody, wherein the method comprises contacting a sample from the subject with the antibody; and detecting binding of the antibody to STn-expressing cancer cells.

17. The antibody for use of claim 14, further comprising administering an anti-STn antibody to the subject.

18. The antibody for use of claim 16 or claim 17, wherein the sample is a cell, a tissue, a tissue section, a body fluid, serum, or a combination thereof.

19. A kit for screening a biological sample for the presence of STn-expressing cancer cells, comprising an antibody of any one of claims 1-5.

20. An antibody-drug conjugate comprising an antibody conjugated to a therapeutic agent, wherein the antibody is an antibody of any one of claims 1-5.

21. The antibody-drug conjugate of claim 18, wherein said therapeutic agent is a cytotoxic agent.

22. The antibody-drug conjugate of claim 19, wherein said cytotoxic agent is monomethyl auristatin E (MMAE) or monomethyl auristatin F (MMAF).

23. The antibody-drug conjugate of claim 20, wherein the cytotoxic agent is MMAE.

24. The antibody-drug conjugate of any one of claims 20-23, wherein the VH comprises the amino acid sequence of SEQ ID NO: 240 and the VL comprises the amino acid sequence of SEQ ID NO: 235.

25. A pharmaceutical composition comprising the antibody-drug conjugate of any one of claims 20-24 and at least one pharmaceutically acceptable excipient.

26. The antibody-drug conjugate of any one of claims 20-24 or the pharmaceutical composition of claim 25 for use in a method of treating cancer in a subject.

27. The antibody-drug conjugate or pharmaceutical composition for use of claim 26, wherein the cytotoxic agent is MMAE.

28. The antibody-drug conjugate or pharmaceutical composition for use of claim 26 or claim 27, wherein the VH comprises the amino acid sequence of SEQ ID NO: 240 and the VL comprises the amino acid sequence of SEQ ID NO: 235.

29. The antibody-drug conjugate or pharmaceutical composition for use of any one of claims 26-28, wherein the cancer is selected from breast cancer, colon cancer, pancreatic cancer, lung cancer, cervical cancer, ovarian cancer, stomach cancer, prostate cancer, and liver cancer.

30. An in vitro method of killing a STn-expressing cell, comprising contacting the cell with an antibody-drug conjugate of any one of claims 20-24.

31. A method of making an antibody-drug conjugate, comprising contacting an antibody that binds to sialyl(α2,6)N-acetylgalactosamine (STn) with maleimidocaproyl-valine-citruline-p-aminobenzyloxycarbonyl-monomethyl auristatin E (MC-γc-PAB-MMAE), wherein the antibody is an antibody of any one of claims 1-5.

32. The method of claim 31, wherein the VH comprises the amino acid sequence of SEQ ID NO: 240 and the VL comprises the amino acid sequence of SEQ ID NO: 235.

33. An isolated antibody that binds to sialyl(α2,6)N-acetylgalactosamine (STn), wherein the antibody comprises:

a) a heavy chain variable domain (VH) comprising an amino acid sequence selected from SEQ ID NOs: 220-224, and a light chain variable domain (VL) comprising an amino acid sequence selected from SEQ ID NOs: 217-219;
b) a VH comprising an amino acid sequence selected from SEQ ID NOs: 230-234, and a VL comprising an amino acid sequence selected from SEQ ID NOs: 225-229;
c) a VH comprising an amino acid sequence selected from SEQ ID NOs: 249-253, and a VL comprising an amino acid sequence selected from SEQ ID NOs: 242-248; or
d) a VH comprising an amino acid sequence selected from SEQ ID NOs: 256-260, and a VL comprising an amino acid sequence selected from SEQ ID NOs: 254 and 255.

34. An isolated nucleic acid that encodes the antibody of claim 33.

35. An isolated host cell comprising the isolated nucleic acid of claim 34.

36. An isolated host cell that expresses the antibody of claim 33.

37. A method of producing an antibody that binds to sialyl(α2,6)N-acetylgalactosamine (STn), comprising culturing the host cell of claim 35 or claim 36 under conditions suitable for expressing the antibody.

38. The antibody of claim 33 for use in a method of treating cancer in a subject.

39. A method of selecting a subject with cancer for treatment with an anti-STn antibody, comprising contacting a sample from the subject with the antibody of claim 33; and detecting binding of the antibody to STn-expressing cancer cells.

40. An antibody-drug conjugate comprising the antibody of claim 33 conjugated to a therapeutic agent.

41. The antibody-drug conjugate of claim 40, wherein said therapeutic agent is a cytotoxic agent.

42. The antibody-drug conjugate of claim 41, wherein said cytotoxic agent is monomethyl auristatin E (MMAE) or monomethyl auristatin F (MMAF).

43. The antibody-drug conjugate of any one of claims 40-42 for use in a method of treating cancer in a subject.

44. An in vitro method of killing a STn-expressing cell, comprising contacting the cell with an antibody-drug conjugate of any one of claims 40-42.

45. A method of making an antibody-drug conjugate, comprising contacting the antibody of claim 33 with maleimidocaproyl-valine-citruline-p-aminobenzyloxycarbonyl-monomethyl auristatin E (MC-γc-PAB-MMAE).