

Claims

1. A pharmaceutical composition for treating a solid cancer, comprising an anti-CD43 antibody or an antigen-binding fragment thereof, wherein the anti-CD43 antibody or the antigen-binding fragment thereof comprises a CDR1H of SEQ ID NO: 110, a CDR2H of SEQ ID NO: 113, a CDR3H of SEQ ID NO: 118, a CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 120, and a CDR3L of SEQ ID NO: 125.
2. The pharmaceutical composition of claim 1, wherein the anti-CD43 antibody or the antigen-binding fragment thereof bind to an epitope consisting of 6-9 consecutive amino acids in the amino acid sequence of SEQ ID NO: 134, and the 6-9 consecutive amino acids which comprises the amino acid sequence of SEQ ID NO: 131.
3. The pharmaceutical composition of claim 2, wherein the anti-CD43 antibody or the antigen-binding fragment thereof bind to an epitope consisting of the amino acid sequence selected from SEQ ID NOs: 131 to 134.
4. The pharmaceutical composition of claim 1, wherein the anti-CD43 antibody or the antigen-binding fragment thereof comprises a CDR1H of SEQ ID NO: 111 or 112, a CDR2H of SEQ ID NO: 114, 115, 116, or 117, a CDR3H of SEQ ID NO: 118, a CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 121, 122, 123, or 124, and a CDR3L of SEQ ID NO: 125.
5. The pharmaceutical composition of claim 1, wherein the anti-CD43 antibody or the antigen-binding fragment thereof has modification of glycosylation motif in a variable region.
6. The pharmaceutical composition of claim 5, wherein the anti-CD43 antibody or the antigen-binding fragment thereof comprises a CDR1H of SEQ ID NO: 111 or 112, a CDR2H of SEQ ID NO: 114, 115, 116, or 117, a CDR3H of SEQ ID NO: 118, a

CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 122, 123, or 124, and a CDR3L of SEQ ID NO: 125.

7. The pharmaceutical composition of any one of claims 1-6, wherein the solid cancer is gastric cancer, breast cancer, lung cancer, colon cancer, liver cancer, gallbladder cancer, renal cancer, pancreatic cancer, thyroid cancer, prostatic cancer, ovarian cancer, cervical cancer, or bladder cancer.

8. The pharmaceutical composition of any one of claims 1-6, wherein the composition further comprises at least one selected from the group consisting of a cytotoxic material and a labeling material.

9. The pharmaceutical composition of claim 8, wherein the cytotoxic material is at least one selected from the group consisting of ricin, saporin, gelonin, momordin, debouganin, diphtheria toxin, pseudomonas toxin, radioisotopes, duocarmycin, monomethyl auristatin E (MMAE), monomethyl auristatin F (MMAF), N2'-deacetyl-N2'-(3-mercapto-1-oxopropyl)maytansine (DM1), and pyrrolobenzodiazepine (PBD) dimer.

10. The pharmaceutical composition of any one of claims 1-6, wherein the composition is characterized by inhibiting a cancer stem cell in the solid cancer.

11. A pharmaceutical composition for inhibiting a cancer stem cell, the composition comprising an anti-CD43 antibody or an antigen-binding fragment thereof, wherein the anti-CD43 antibody or the antigen-binding fragment thereof comprises a CDR1H of SEQ ID NO: 110, a CDR2H of SEQ ID NO: 113, a CDR3H of SEQ ID NO: 118, a CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 120, and a CDR3L of SEQ ID NO: 125.

12. The pharmaceutical composition of claim 11, wherein the anti-CD43 antibody or the antigen-binding fragment thereof bind to an epitope consisting of 6-9 consecutive

amino acids in the amino acid sequence of SEQ ID NO: 134, and the 6-9 consecutive amino acids which comprises the amino acid sequence of SEQ ID NO: 131.

5 13. The pharmaceutical composition of claim 11, wherein the anti-CD43 antibody or the antigen-binding fragment thereof bind to an epitope consisting of the amino acid sequence selected from SEQ ID NOs: 131 to 134.

10 14. The pharmaceutical composition of claim 11, wherein the anti-CD43 antibody or the antigen-binding fragment thereof comprises a CDR1H of SEQ ID NO: 111 or 112, a CDR2H of SEQ ID NO: 114, 115, 116, or 117, a CDR3H of SEQ ID NO: 118, a CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 121, 122, 123, or 124, and a CDR3L of SEQ ID NO: 125.

15 15. The pharmaceutical composition of claim 11, wherein the anti-CD43 antibody or the antigen-binding fragment thereof is modified by substitution of an amino acid capable of being glycosylated in a light chain variable region with other amino acid incapable of being glycosylated.

20 16. The pharmaceutical composition of claim 15, wherein the anti-CD43 antibody or the antigen-binding fragment thereof comprises a CDR1H of SEQ ID NO: 111 or 112, a CDR2H of SEQ ID NO: 114, 115, 116, or 117, a CDR3H of SEQ ID NO: 118, a CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 122, 123, or 124, and a CDR3L of SEQ ID NO: 125.

25 17. The pharmaceutical composition of any one of claims 11-16, wherein the composition further comprises at least one selected from the group consisting of a cytotoxic material and a labeling material.

30 18. The pharmaceutical composition of claim 17, wherein the cytotoxic material is at least one selected from the group consisting of ricin, saporin, gelonin, momordin,

debouganin, diphtheria toxin, pseudomonas toxin, radioisotopes, duocarmycin, monomethyl auristatin E (MMAE), monomethyl auristatin F (MMAF), N2'-deacetyl-N2'-(3-mercapto-1-oxopropyl)maytansine (DM1), and pyrrolobenzodiazepine (PBD) dimer.

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19. The pharmaceutical composition of any one of claims 11-16, wherein the cancer stem cell is a cancer stem cell in hematologic malignancy or solid cancer.

20. An anti-CD43 antibody or an antigen-binding fragment thereof, comprising a
10 CDR1H of SEQ ID NO: 110, a CDR2H of SEQ ID NO: 113, a CDR3H of SEQ ID NO: 118, a CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 120, and a CDR3L of SEQ ID NO: 125.

21. The anti-CD43 antibody or an antigen-binding fragment thereof of claim 20,
15 comprising a CDR1H of SEQ ID NO: 111 or 112, a CDR2H of SEQ ID NO: 114, 115, 116, or 117, a CDR3H of SEQ ID NO: 118, a CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 121, 122, 123, or 124, and a CDR3L of SEQ ID NO: 125.

22. The anti-CD43 antibody or an antigen-binding fragment thereof of claim 20,
20 which is modified by substitution of an amino acid capable of being glycosylated in a light chain variable region with other amino acid incapable of being glycosylated.

23. The anti-CD43 antibody or an antigen-binding fragment thereof of claim 22,
25 comprising a CDR1H of SEQ ID NO: 111 or 112, a CDR2H of SEQ ID NO: 114, 115, 116, or 117, a CDR3H of SEQ ID NO: 118, a CDR1L of SEQ ID NO: 119, a CDR2L of SEQ ID NO: 122, 123, or 124, and a CDR3L of SEQ ID NO: 125.

24. The anti-CD43 antibody or an antigen-binding fragment thereof of claim 20,
30 comprising a heavy chain variable region of SEQ ID NO: 2, 6, 10, 14, 18, 22, 26, 30, 83, 84, 85, 86, 87, 88, 89, 90, 91, 92, 93, or 94; and a light chain variable region of SEQ ID NO: 4, 8, 12, 16, 20, 24, 28, 32, 95, 96, 97, 98, 99, 100, 101, 102, 103, 104,

105, 106, 107, 108, or 109.

25. The anti-CD43 antibody or an antigen-binding fragment thereof of any one of claims 20-24, wherein the anti-CD43 antibody or an antigen-binding fragment thereof
5 is an animal-derived antibody, a chimeric antibody, or a humanized antibody.

26. The anti-CD43 antibody or an antigen-binding fragment thereof of any one of claims 20-24, wherein the antigen-binding fragment thereof is selected from the group consisting of Fab, F(ab)₂, Fv, scFv, and scFv-Fc of the anti-CD43 antibody.

10 27. A conjugate, comprising
the anti-CD43 antibody or an antigen-binding fragment thereof of any one of claims 20-24; and at least one selected from the group consisting of a cytotoxic material and a labeling material.

15 28. The conjugate of claim 27, wherein the cytotoxic material is at least one selected from the group consisting of ricin, saporin, gelonin, momordin, debouganin, diphtheria toxin, pseudomonas toxin, radioisotopes, duocarmycin, monomethyl auristatin E (MMAE), monomethyl auristatin F (MMAF), N²'-deacetyl-N²'-(3-
20 mercapto-1-oxopropyl)maytansine (DM1), and pyrrolobenzodiazepine (PBD) dimer.

29. An anticancer agent, comprising
the anti-CD43 antibody or an antigen-binding fragment thereof of any one of claims 20-247, and a pharmaceutically acceptable carrier.

25 30. The anticancer agent of claim 29, wherein the anticancer agent has anticancer activity against hematologic malignancy.

30 31. The anticancer agent of claim 30, wherein the hematologic malignancy is acute myeloid leukemia, acute lymphoblastic leukemia, acute monocytic leukemia, Hodgkin's lymphoma, or non-Hodgkin's lymphoma.

32. An anticancer agent, comprising:
the conjugate of claim 28, and a pharmaceutically acceptable carrier.

5 33. The anticancer agent of claim 32, which has anticancer activity against a solid cancer.

34. The anticancer agent of claim 32, which has anticancer activity against hematologic malignancy.

10 35. The anticancer agent of claim 32, which has inhibitory activity against a cancer stem cell.

36. A nucleic acid molecule encoding the anti-CD43 antibody or an antigen-binding fragment thereof of any one of claims 20-24.

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37. A recombinant vector comprising the nucleic acid molecule of claim 36.

38. A recombinant cell comprising the recombinant vector of claim 37.

20 39. A method of producing the anti-CD43 antibody or an antigen-binding fragment thereof, comprising culturing the recombinant cell of claim 38.