(1965) *J. Expl. Med.* 122:467-81; Chevinsky, A. H. (1991) *Semin. Surg. Oncol.* 7, 162–166; Shively, J. E. et al., (1985) *Crit. Rev. Oncol. Hematol.* 2, 355–399).

[0007] More importantly, CEA has become a potentially useful tumor-associated antigen for targeted therapy (Kuroki M, et al. (2002) *Anticancer Res* 22:4255– 64). Two major strategies using CEA as a target for cancer immunotherapy have been developed. One method is the specific targeting of suicide genes (nitric oxide synthase (iNOS) gene) (Kuroki M. et al., (2000) *Anticancer Res.* 20(6A):4067-71) or isotopes (Wilkinson R W. et al., (2001) *PNAS USA* 98, 10256-60, Goldenberg, D. M. (1991) *Am. J. Gastroenterol.*, 86: 1392–1403, Olafsen T. et al., Protein Engineering, Design & Selection ,17, 21-27, 2004) to CEA-expressing tumor cells by anti-CEA antibodies. This method has also been extended to the use of antibody or antibody fragment conjugated with therapeutic agents, such as drugs, toxins, radionucleotides, immumodulators or cytokines. The other method is to utilize immunological cytolytic activities, specifically through antibody-dependent cellular cytotoxicity (ADCC) or complement-dependent cytotoxicity (CDC) to eliminate CEA-expressing tumor cells (Imakiire T et al., (2004) *Int. J. Cancer*: 108, 564–570). These methods often give rise to cytokine releases resulting in systemic side effects.

[0008] Antibodies recognizing a carbohydrate containing epitope present on CD-43 and CEA expressed on nonhematopoietic cancer cells have been described in U.S. Patent Application Pub. No. 2008/0171043 and PCT WO 07/146172. These antibodies can induce apoptosis in these nonhematopoietic cancer cells in the absence of cytotoxin conjugation and immune effector function.

[0009] All references, publications, and patent applications disclosed herein are hereby incorporated by reference in their entirety.

BRIEF SUMMARY OF THE INVENTION

[0009a] In one aspect, there is provided an isolated antibody comprising a heavy chain and a light chain, wherein

(a) the heavy chain comprises a heavy chain variable region comprising the three complementary determining regions (CDRs) from the amino acid sequence of SEQ ID NO: 1, wherein HCDR1 comprises SYVMH, HCDR2 comprises YINPYNGGTQYNEKFKG and HCDR3 comprises RTFPYYFDY); and a heavy chain constant region comprising the amino acid sequence of SEQ ID NO:9, wherein the hinge region of the heavy chain constant region comprises at least one amino acid insertion, deletion or substitution; and

(b) the light chain comprises a light chain variable region comprising the three complementary determining regions from the amino acid sequence of SEQ ID NO:2, wherein LCDR1 comprises RSSQSILHSNGNTYLE, LCDR2 comprises KVSNRFS and LCDR3 comprises FQGSHAPLT; and a light chain constant region comprising the amino acid sequence of SEQ ID NO: 10 and further comprising at least one amino acid insertion, wherein the antibody binds a carbohydrate epitope on the extracellular domain of a human CD43 and/or human CEA expressed by a nonhematopoietic cancer cell and is capable of inducing apoptosis of the nonhematopoietic cancer cell in the absence of cytotoxin conjugation and immune effector function.

[0010] Disclosed are~~The invention provides~~ antibodies (e.g., chimeric and humanized antibodies), which specifically bind to an epitope on CD43 and/or CEA expressed by a nonhematopoietic cancer cell, but do not specifically bind to a CD43 expressed by a leukocyte or by a Jurkat cell, and are capable of inducing apoptosis of the nonhematopoietic cancer cell after binding to the epitope expressed on cell surface of the nonhematopoietic cancer cell in the absence of cytotoxin conjugation and immune effector function, wherein the epitope comprises a carbohydrate, and the binding of the antibody to the epitope is inhibited by a carbohydrate

comprising a Le^a structure, a Le^a-lactose structure, a LNDFH II structure, or a LNT structure. In some ~~embodiments~~examples, the epitope that the antibodies bind to is fucose sensitive.

[0011] In some ~~embodiments~~examples, the antibodies are chimeric or humanized antibodies derived from murine antibody m5F1 having at least one amino acid insertion, deletion or substitution in the hinge region of the heavy chain constant region.

[0011a] In another aspect, there is provided an isolated antibody comprising a heavy chain and a light chain, wherein

(a) the heavy chain comprises a heavy chain variable region comprising the three complementary determining regions (CDRs) from the amino acid sequence of SEQ ID NO: 1, wherein HCDR1 comprises SYVMH, HCDR2 comprises YINPYNGGTQYNEKFKG and HCDR3 comprises RTFPYYFDY; and a heavy chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:25-30; and

(b) the light chain comprises a light chain variable region comprising the three complementary determining regions from the amino acid sequence of SEQ ID NO:2, wherein LCDR1 comprises RSSQSILHSNGNTYLE, LCDR2 comprises KVSNRFS and LCDR3 comprises FQGSHAPLT; and a light chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37,

wherein the antibody binds a carbohydrate epitope on the extracellular domain of a human CD43 and/or human CEA expressed by a nonhematopoietic cancer cell and is capable of inducing apoptosis of the nonhematopoietic cancer cell in the absence of cytotoxin conjugation and immune effector function.

[0012] In some ~~embodiments~~examples, the ~~invention~~present disclosure provides isolated antibodies comprising a heavy chain and a light chain, wherein (a) the heavy chain comprises a heavy chain variable region comprising three complementary determining regions from the amino acid sequence of SEQ ID NO:1 and a heavy chain constant region of human IgG1, wherein the hinge region of the heavy chain constant region comprises at least one amino acid insertion, deletion or substitution; and (b) the light chain comprises a light chain variable region comprising three complementary determining regions from the amino acid sequence of SEQ ID NO:2 and a light chain constant region from human kappa light chain or a light chain constant region from human kappa light chain comprising at least one amino acid insertion, deletion or substitution. In some ~~embodiments~~examples, the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:27 or SEQ ID NO:29.

[0013] In some ~~embodiments~~examples, one, two, three, four, five, six, seven, eight, nine or ten amino acids are inserted N-terminal to amino acid K218 in the hinge region of human IgG1, wherein the numbering of the residue is that of the EU numbering system. See Burton, *Mol. Immunol.* 22:161-206, 1985. In some ~~embodiments~~examples, amino acid residues KSD is inserted N-terminal to amino acid K218.

[0014] In some ~~embodiments~~examples, the antibodies comprise: (a) a heavy chain variable region comprising three CDR regions from the amino acid sequence of SEQ ID NO:1 and a heavy chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:11-30; and (b) a light chain variable region comprising three CDR regions from the amino acid sequence of SEQ ID NO:2; and a light chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37. In some ~~embodiments~~examples, the antibody is a humanized antibody. In some ~~embodiments~~examples, the antibody is a chimeric antibody. In some ~~embodiments~~examples, the heavy chain variable region comprises the amino acid sequence selected from the group consisting of SEQ ID NOS: 1, 3 and 87-91. In some ~~embodiments~~examples, the light chain variable region comprises the amino acid sequence selected from the group consisting of SEQ ID NOS: 2, 4 and 92-96. In some

embodiments, the heavy chain variable region of the antibody comprises the amino acid sequence of residues 20-137 of SEQ ID NO:1 or SEQ ID NO:3 or the variable region amino acid sequence from SEQ ID NO:1 or SEQ ID NO:3. In some ~~embodiments~~examples, the light chain variable region of the antibody comprises the amino acid sequence of residues 20-131 of SEQ ID NO:2, the variable region amino acid sequence from SEQ ID NO:2, the amino acid sequence of residues 21-132 of SEQ ID NO:4, or the variable region amino acid sequence from SEQ ID NO:4.

[0015] In some ~~embodiments~~examples, the antibody of the invention comprises a heavy chain and a light chain, wherein the heavy chain comprises a heavy chain variable region comprising the amino acid sequence of residues 20-137 of SEQ ID NO:1 or the variable region amino acid sequence from SEQ ID NO:1, and a heavy chain constant region comprising the amino acid sequence of SEQ ID NO:27, and the light chain comprises a light chain variable region comprising the amino acid sequence of residues 20-131 of SEQ ID NO:2 or the variable region amino acid sequence from SEQ ID NO:2, and a light chain constant region comprising the amino acid sequence of SEQ ID NO:10.

[0016] In some ~~embodiments~~examples, the antibody of the invention comprises a heavy chain and a light chain, wherein the heavy chain comprises a heavy chain variable region comprising the amino acid sequence of residues 20-137 of SEQ ID NO:1 or the variable region amino acid sequence from SEQ ID NO:1, and a heavy chain constant region comprising the amino acid sequence of SEQ ID NO:29, and the light chain comprises a light chain variable region comprising the amino acid sequence of residues 20-131 of SEQ ID NO:2 or the variable region amino acid sequence from SEQ ID NO:2, and a light chain constant region comprising the amino acid sequence of SEQ ID NO:34.

[0017] In some ~~embodiments~~examples, the antibody of the invention comprises a heavy chain and a light chain, wherein the heavy chain comprises a heavy chain variable region comprising the amino acid sequence of residues 20-137 of SEQ ID NO:1 or the variable region amino acid sequence from SEQ ID NO:1, and a heavy chain constant region comprising the amino acid sequence of SEQ ID NO:29, and the light chain comprises a light chain variable region comprising the amino acid sequence of residues 20-131 of SEQ ID NO:2 or the variable region amino acid sequence from SEQ ID NO:2, and a light chain constant region comprising the amino acid sequence of SEQ ID NO:35.

[0018] The ~~invention~~present disclosure also provides an antigen-binding fragments of the antibodies described herein.

[0018a] In yet another aspect, there is provided a pharmaceutical composition comprising the antibody as defined above, and a pharmaceutically acceptable carrier.

[0019] The ~~invention~~present disclosure also provides pharmaceutical compositions comprising one or more of the antibodies described herein or the antigen-binding fragments thereof and a pharmaceutically acceptable carrier.

[0020] The invention provides polynucleotides and vectors comprising a nucleic acid sequence encoding a heavy chain of the antibody described herein and/or a light chain of the antibody described herein or a fragment thereof. In some ~~embodiments~~examples, the polynucleotides and the vectors comprise a nucleic acid sequence encoding a heavy chain comprising a heavy chain variable region comprising three CDR regions from the amino acid sequence of SEQ ID NO:1 and a heavy chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:11-30. In some ~~embodiments~~examples, the polynucleotides and the vectors comprise a nucleic acid sequence encoding a light chain comprising a light chain variable region comprising three CDR regions from the amino acid sequence of SEQ ID NO:2 and a light chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37.

[0021] The invention also provides host cells comprising the polynucleotides and the vectors described herein.

[0021a] In yet another aspect, there is provided a method of producing an antibody, comprising culturing the host cell as defined above that produces the antibody encoded by the nucleic acid, and recovering the antibody from the cell culture, or comprising expressing in a host cell,

(a) a polynucleotide comprising nucleic acid sequence encoding a the heavy chain comprises a heavy chain variable region comprising the three CDRs from the amino acid sequence of SEQ ID NO: 1 wherein HCDR1 comprises SYVMH, HCDR2 comprises YINPYNGGTQYNEKFKG and HCDR3 comprises RTFPYYFDY; and a heavy chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:11-30; and

(b) a polynucleotide comprising nucleic acid sequence encoding a light chain variable region comprising the three CDRs from the amino acid sequence of SEQ ID NO:2, wherein

LCDR1 comprises RSSQSILHSNGNTYLE, LCDR2 comprises KVSNRFS and LCDR3 comprises FQGSHAPLT; and a light chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37,

wherein the polynucleotides encoding the heavy chain and light chain are co-expressed in said host cell

and wherein the antibody binds a carbohydrate epitope on the extracellular domain of a human CD43 and/or human CEA expressed by a nonhematopoietic cancer cell and is capable of inducing apoptosis of the nonhematopoietic cancer cell in the absence of cytotoxin conjugation and immune effector function.

[0022] Also disclosed are~~The invention further provides~~ methods for producing any of the antibodies or antigen-binding fragments described herein. The methods may comprise the step of expressing one or more polynucleotides encoding the antibodies (which may be separately expressed as a single heavy or light chain, or both heavy and light chain are expressed from one vector) or antigen-binding fragments thereof in suitable host cell. In some embodiments, the expressed antibodies or antigen-binding fragments thereof are recovered and/or isolated. The invention also provides antibodies or antigen-binding fragments produced by the methods.

[0023] Also disclosed is~~The invention provides~~ a method for treating a nonhematopoietic cancer in an individual having the cancer comprising administering to the individual an effective amount of a composition comprising one or more antibodies described herein, wherein the one or more antibodies bind to the cancer cells in the individual. In some ~~embodiments~~examples, the nonhematopoietic cancer is colorectal, pancreatic, or gastric cancer. In some ~~embodiments~~examples, the antibody is conjugated to a cytotoxin.

[0024] Also disclosed is~~The invention provides~~ a method for delaying development of a nonhematopoietic cancer (such as delaying and/or inhibiting cancer progression) in an individual comprising administering to the individual an effective amount of a composition comprising one or more antibodies described herein, wherein the one or more antibodies bind to the cancer cells in the individual. In some ~~embodiments~~examples, the nonhematopoietic cancer is colorectal, pancreatic, or gastric cancer. In some ~~embodiments~~examples, the antibody is conjugated to a cytotoxin.

[0024a] In yet another aspect, there is provided an antibody as defined above for use in treating nonhematopoietic cancer in an individual having cancer, wherein the antibody binds to the cancer cells in the individual.

[0025] Also disclosed is~~The invention also provides~~ a method for treating nonhematopoietic cancer in an individual comprising administering to the individual an amount of one or more antibodies described herein and an amount of another anti-cancer agent, wherein the one or more antibodies bind to the cancer cells in the individual, and whereby the one or more antibodies and the anti-cancer agent in conjunction provide effective treatment of cancer in the individual. In some ~~embodiments~~examples, the nonhematopoietic cancer is colorectal, pancreatic, or gastric cancer. In some ~~embodiments~~examples, the anti-cancer agent is a chemotherapeutic agent.

[0026] The invention further provides kits comprising a pharmaceutical composition comprising one or more antibodies described herein. In some embodiments, the kits further comprise instructions for administering an effective amount of the pharmaceutical composition to an individual for treating nonhematopoietic cancer. In some embodiments, the kits comprise instructions for administering the pharmaceutical composition in conjunction with another anti-cancer agent. In some ~~embodiments~~examples, the antibody comprises: (a) a heavy chain variable region comprising three CDR regions from the amino acid sequence of SEQ ID NO:1 and a heavy chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:11-30; and (b) a light chain variable region comprising three CDR regions from the amino acid sequence of SEQ ID NO:2; and a constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37.

[0027] Also disclosed are~~The invention also provides~~ kits comprising a first pharmaceutical composition comprising an antibody or an antigen-binding fragment described herein, a second pharmaceutical composition comprising another anti-cancer agent, and instructions for administering the first pharmaceutical composition and the second pharmaceutical composition in conjunction to an individual for treating nonhematopoietic cancer.

[0028] It is to be understood that one, some, or all of the properties of the various embodiments described herein may be combined to form other embodiments of the present

CLAIMS

What is claimed is:

1. An isolated antibody comprising a heavy chain and a light chain, wherein

(a) the heavy chain comprises a heavy chain variable region comprising three complementary determining regions (CDRs) from the amino acid sequence of SEQ ID NO:1, and a heavy chain constant region comprising the amino acid sequence of SEQ ID NO:9, wherein the hinge region of the heavy chain constant region comprises at least one amino acid insertion, deletion or substitution; and

(b) the light chain comprises a light chain variable region comprising three complementary determining regions from the amino acid sequence of SEQ ID NO:2, and a light chain constant region comprising the amino acid sequence of SEQ ID NO:10 or a light chain constant region comprising the amino acid sequence of SEQ ID NO:10 and further comprising at least one amino acid insertion.

2. The antibody of claim 1, wherein the antibody is a humanized antibody.

3. The antibody of claim 1, wherein the antibody is a chimeric antibody.

4. The antibody of claim 1, wherein the heavy chain constant region comprises the amino acid sequence selected from the group consisting of SEQ ID NOS:25-30, and the light chain constant region comprises the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37.

5. The antibody of claim 4, wherein the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:27.

6. The antibody of claim 4, wherein the heavy chain variable region comprises the amino acid sequence of residues 20-137 of SEQ ID NO:1 and the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:27, and the light chain variable region comprises the amino acid sequence of residues 20-131 of SEQ ID NO:2 and the light chain constant region comprises the amino acid sequence of SEQ ID NO:10.

7. The antibody of claim 4, wherein the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:29.

8. The antibody of claim 4, wherein the heavy chain variable region comprises the amino acid sequence of residues 20-137 of SEQ ID NO:1 and the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:29, and the light chain variable region comprises the amino acid sequence of residues 20-131 of SEQ ID NO:2 and the light chain constant region comprises the amino acid sequence of SEQ ID NO:34.

9. The antibody of claim 4, wherein the heavy chain variable region comprises the amino acid sequence of residues 20-137 of SEQ ID NO:1 and the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:29, and the light chain variable region comprises the amino acid sequence of residues 20-131 of SEQ ID NO:2 and the light chain constant region comprises the amino acid sequence of SEQ ID NO:35.

10. A pharmaceutical composition comprising the antibody of any one of claims 1-9, and a pharmaceutically acceptable carrier.

11. A polynucleotide comprising a nucleic acid sequence encoding the antibody of any one of claims 1-9.

12. A vector comprising a nucleic acid sequence encoding the antibody of any one of claims 1-9.

13. A host cell comprising the vector of claim 12.

14. A method of producing an antibody, comprising culturing the host cell of claim 13 that produces the antibody encoded by the nucleic acid, and recovering the antibody from the cell culture.

15. An antibody produced by the method of claim 14.

16. A method of producing an antibody, comprising expressing in a host cell,

(a) a polynucleotide comprising a nucleic acid sequence encoding a heavy chain comprising a heavy chain variable region comprising three CDRs from the amino acid sequence of SEQ ID NO:1 and a heavy chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:11-30; and

(b) a polynucleotide comprising a nucleic acid sequence encoding a light chain comprising a light chain variable region comprising three CDRs from the amino acid sequence of SEQ ID NO:2 and a constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37,

wherein the polynucleotides encoding the heavy chain and light chain are co-expressed in said host cell.

17. The method of claim 16, wherein the antibody is isolated.

18. A method for treating nonhematopoietic cancer in an individual having cancer comprising administering to the individual an effective amount of a composition comprising the antibody of any one of claims 1-9 and 15, wherein the antibody binds to the cancer cells in the individual.

19. The method of claim 18, wherein the nonhematopoietic cancer is colorectal, pancreatic, or gastric cancer.

20. The method of claim 18, wherein the antibody is conjugated to a cytotoxin.

21. A method for treating nonhematopoietic cancer in an individual comprising administering to the individual an amount of the antibody of any one of claims 1-9 and 15, and an amount of another anti-cancer agent, wherein the antibody binds to the cancer cells in the individual, and whereby the antibody and the anti-cancer agent in conjunction provides effective treatment of cancer in the individual.

22. The method of claim 21, wherein the nonhematopoietic cancer is colorectal, pancreatic, or gastric cancer.

23. The method of claim 21, wherein the anti-cancer agent is a chemotherapeutic agent.

24. A kit comprising a pharmaceutical composition comprising the antibody of any one of claims 1-9 and 15, and instructions for administering an effective amount of the pharmaceutical composition to an individual for treating nonhematopoietic cancer.

25. The kit of claim 24, wherein the kit further comprises instructions for administering the pharmaceutical composition in conjunction with another anti-cancer agent to an individual for treating nonhematopoietic cancer.

26. A kit comprising a first pharmaceutical composition comprising the antibody of any one of claims 1-9 and 15, a second pharmaceutical composition comprising another anti-cancer agent, and instructions for administering the first pharmaceutical composition and the second pharmaceutical composition in conjunction to an individual for treating nonhematopoietic cancer.

CLAIMS

What is claimed is:

1. An isolated antibody comprising a heavy chain and a light chain, wherein

(a) the heavy chain comprises a heavy chain variable region comprising the three complementary determining regions (CDRs) from the amino acid sequence of SEQ ID NO: 1, wherein HCDR1 comprises SYVMH, HCDR2 comprises YINPYNGGTQYNEKFKG and HCDR3 comprises RTFPYYFDY); and a heavy chain constant region comprising the amino acid sequence of SEQ ID NO:9, wherein the hinge region of the heavy chain constant region comprises at least one amino acid insertion, deletion or substitution; and

(b) the light chain comprises a light chain variable region comprising the three complementary determining regions from the amino acid sequence of SEQ ID NO:2, wherein LCDR1 comprises RSSQSILHSNGNTYLE, LCDR2 comprises KVSNRFS and LCDR3 comprises FQGSHAPLT; and a light chain constant region comprising the amino acid sequence of SEQ ID NO: 10 and further comprising at least one amino acid insertion, wherein the antibody binds a carbohydrate epitope on the extracellular domain of a human CD43 and/or human CEA expressed by a nonhematopoietic cancer cell and is capable of inducing apoptosis of the nonhematopoietic cancer cell in the absence of cytotoxin conjugation and immune effector function.

2. An isolated antibody comprising a heavy chain and a light chain, wherein

(a) the heavy chain comprises a heavy chain variable region comprising the three complementary determining regions (CDRs) from the amino acid sequence of SEQ ID NO: 1, wherein HCDR1 comprises SYVMH, HCDR2 comprises YINPYNGGTQYNEKFKG and HCDR3 comprises RTFPYYFDY; and a heavy chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:25-30; and

(b) the light chain comprises a light chain variable region comprising the three complementary determining regions from the amino acid sequence of SEQ ID NO:2, wherein LCDR1 comprises RSSQSILHSNGNTYLE, LCDR2 comprises KVSNRFS and LCDR3 comprises FQGSHAPLT; and a light chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37,

wherein the antibody binds a carbohydrate epitope on the extracellular domain of a human CD43 and/or human CEA expressed by a nonhematopoietic cancer cell and is capable of inducing apoptosis of the nonhematopoietic cancer cell in the absence of cytotoxin conjugation and immune effector function.

3. The antibody of claim 1 or 2, wherein the antibody is a humanized or chimeric antibody.

4. The antibody of claim 3, wherein the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:27 or 29.

5. The antibody of claim 4, wherein the heavy chain variable region comprises the amino acid sequence of residues 20-137 of SEQ ID NO: 1 and the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:27, and the light chain variable region comprises the amino acid sequence of residues 20-131 of SEQ ID NO:2 and the light chain constant region comprises the amino acid sequence of SEQ ID NO: 10, or the heavy chain variable region comprises the amino acid sequence of residues 20-137 of SEQ ID NO: 1 and the heavy chain constant region comprises the amino acid sequence of SEQ ID NO: 29, and the light chain variable region comprises the amino acid sequence of residues 20-131 of SEQ ID NO:2 and the light chain constant region comprises the amino acid sequence of SEQ ID NO:34 or 35.

6. The antibody of claim 3, wherein the heavy chain variable region comprises the amino acid sequence of residues 20-137 of SEQ ID NO:1 and the heavy chain constant region comprises the amino acid sequence of SEQ ID NO:29, and the light chain variable region comprises the amino acid sequence of residues 20-131 of SEQ ID NO:2 and the light chain constant region comprises the amino acid sequence of SEQ ID NO:34.

7. The antibody of claim 1 wherein the antibody is conjugated to a cytotoxin.

8. A pharmaceutical composition comprising the antibody of any one of claims 1-7, and a pharmaceutically acceptable carrier.

9. A polynucleotide comprising a nucleic acid sequence encoding the antibody of any one of claims 1-7.

10. A vector comprising a nucleic acid sequence encoding the antibody of any one of claims 1-7.

11. A host cell comprising the vector of claim 10.

12. A method of producing an antibody, comprising culturing the host cell of claim 11 that produces the antibody encoded by the nucleic acid, and recovering the antibody from the cell culture, or comprising expressing in a host cell,

(a) a polynucleotide comprising nucleic acid sequence encoding a the heavy chain comprises a heavy chain variable region comprising the three CDRs from the amino acid sequence of SEQ ID NO: 1 wherein HCDR1 comprises SYVMH, HCDR2 comprises YINPYNGGTQYNEKFKG and HCDR3 comprises RTFPYYFDY; and a heavy chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:11-30; and

(b) a polynucleotide comprising nucleic acid sequence encoding a light chain variable region comprising the three CDRs from the amino acid sequence of SEQ ID NO:2, wherein LCDR1 comprises RSSQSILHSNGNTYLE, LCDR2 comprises KVSNRFS and LCDR3 comprises FQGSHAPLT; and a light chain constant region comprising the amino acid sequence selected from the group consisting of SEQ ID NOS:10 and 31-37,

wherein the polynucleotides encoding the heavy chain and light chain are co-expressed in said host cell

and wherein the antibody binds a carbohydrate epitope on the extracellular domain of a human CD43 and/or human CEA expressed by a nonhematopoietic cancer cell and is capable of inducing apoptosis of the nonhematopoietic cancer cell in the absence of cytotoxin conjugation and immune effector function.

13. An antibody of any one of claims 1 to 7 for use in treating nonhematopoietic cancer in an individual having cancer, wherein the antibody binds to the cancer cells in the individual.

14. The antibody of any one of claims 1 to 7 for use according to claim 13, wherein the nonhematopoietic cancer is colorectal, pancreatic, or gastric cancer.

15. The antibody of any one of claims 1 to 7 for use according to claim 13, wherein the antibody is conjugated to a cytotoxin.

16. The antibody of any one of claims 1 to 7 for use according to any one of claims 13 to 15 in combination with an amount of another anti-cancer agent, optionally a chemotherapeutic agent, and whereby the antibody and the anti-cancer agent in conjunction provides effective treatment of cancer in the individual.

17. A kit comprising a pharmaceutical composition comprising the antibody of any one of claims 1-7, and instructions for administering an effective amount of the pharmaceutical composition to an individual for treating nonhematopoietic cancer, optionally, wherein the kit further comprises instructions for administering the pharmaceutical composition in conjunction with another anti-cancer agent to an individual for treating nonhematopoietic cancer or a second composition comprising another anti-cancer agent.