What is claimed:

1. An isolated monoclonal antibody, or an antigen-binding portion thereof, an antibody fragment, or an antibody mimetic which binds an epitope on human CADM1 recognized by an antibody comprising a heavy chain variable region comprising the amino acid sequence set forth in SEQ ID NO: 19, 20, or 21 and a light chain variable region comprising the amino acid sequence set forth in SEQ ID NO: 22, 23, or 24.

2. An isolated monoclonal antibody, or an antigen-binding portion thereof, an antibody fragment, or an antibody mimetic which binds an epitope on human CADM1 recognized by an antibody comprising CDRs as defined in Figures 1-3, including DNA and amino acid changes that maintain 90% of the binding to human CADM1 of the original sequences regardless of the framework upon which these CDRs are placed.

3. The antibody of claim 1 or claim 2, wherein said antibody is a full-length antibody of an IgG1, IgG2, IgG3, or IgG4 isotype.

4. The antibody of claim 1 or claim 2, wherein said antibody is selected from the group consisting of: a whole antibody, an antibody fragment, a humanized antibody, a human antibody, a single chain antibody, an engineered antibody resulting in increased binding to Fc receptors and/or increased potency for ADCC , and a bispecific antibody.

5. The antibody fragment of claim 1 or claim 2, wherein the fragment is selected from the group consisting of: a UniBody, a domain antibody, and a Nanobody.

6. The antibody mimetic of claim 1 or claim 2, wherein the mimetic is selected from the group consisting of: an Affibody, a DARPin, an Anticalin, an Avimer, a Versabody, and a Duocalin.

7. The antibody of claim 1 or claim 2 which is conjugated to a therapeutic agent.

8. The antibody of claim 7 wherein the therapeutic agent is a cytotoxin or a radioactive isotope.

9. The isolated antibody of claim 1 or claim 2, wherein said antibody binds to human CADM1 with an EC_{50} in the range of < 50 Nm.

10. The isolated antibody of claim 1 or claim 2, wherein said antibody binds to human CADM1 with an EC_{50} in the range of < 10 Nm.

11. The isolated antibody of claim 1 or claim 2, wherein said antibody binds to human CADM1 with an EC_{50} in the range of < 1 Nm.

12. A composition comprising the isolated antibody or antigen-binding portion thereof of claim 1 or claim 2 and a pharmaceutically acceptable carrier.

13. An isolated nucleic acid molecule encoding the heavy or light chain of the antibody or antigen-binding portion thereof of claim 1 or claim 2.

14. An expression vector comprising the nucleic acid molecule of claim 13.

15. A host cell comprising the expression vector of claim 14.

16. A method for preparing an anti-CADM1 antibody, said method comprising the steps of:

obtaining a host cell that contains one or more nucleic acid molecules encoding the antibody of claim 1 or claim 2;

growing the host cell in a host cell culture;

providing host cell culture conditions wherein the one or more nucleic acid molecules are expressed; and

recovering the antibody from the host cell or from the host cell culture.

17. A method for treating or preventing a disease associated with target cells expressing CADM1, said method comprising the step of administering to a subject an anti-CADM1 antibody, or antigen-binding portion thereof, in an amount effective to treat or prevent the disease.

18. The method of claim 17, wherein said disease is a human cancer.

19. The method of claim 18, wherein said human cancer is selected from the group consisting of: small cell lung cancer, adult T-cell leukemia, non-small cell lung cancer (including squamous carcinomas and adenocarcinomas), melanoma, breast cancer, colorectal cancer, ovarian cancer, prostate cancer, neuroendocrine cancers including those of lung, adrenal, pituitary, GI-tract, kidney, liver (including hepatocellular

carcinomas), pancreas (including insulinomas and glucagonomas), glioblastomas, and carcinoid tumors including those of the pancreas, lung, GI tract, liver, and kidney.

20. An isolated monoclonal antibody or an antigen binding portion thereof, an antibody fragment, or an antibody mimetic which binds an epitope on human CADM1 recognized by an antibody comprising a heavy chain variable region and a light chain variable region selected from the group consisting of:

the heavy chain variable region amino acid sequence set forth in SEQ ID NO:19 and the light chain variable region amino acid sequence set forth in SEQ ID NO:22;

the heavy chain variable region amino acid sequence set forth in SEQ ID NO:20 and the light chain variable region amino acid sequence set forth in SEQ ID NO:23;

the heavy chain variable region amino acid sequence set forth in SEQ ID NO:21 and the light chain variable region amino acid sequence set forth in SEQ ID NO:24.

21. The isolated antibody of claim 20, wherein said antibody is selected from the group consisting of: a whole antibody, an antibody fragment, a humanized antibody, a human antibody, a single chain antibody, an engineered antibody resulting in increased binding to Fc receptors and/or increased potency for ADCC, and a bispecific antibody.

22. The antibody fragment of claim 20, wherein the fragment is selected from the group consisting of: a UniBody, a domain antibody, and a Nanobody.

23. The antibody mimetic of claim 20, wherein the mimetic is selected from the group consisting of: an Affibody, a DARPin, an Anticalin, an Avimer, a Versabody, and a Duocalin.

24. A composition comprising the isolated antibody or antigen binding portion thereof of claim 20 and a pharmaceutically acceptable carrier.

25. An isolated nucleic acid molecule encoding the heavy or light chain of the isolated antibody or antigen binding portion thereof of claim 20.

26. An expression vector comprising the nucleic acid molecule of claim 25.

27. A host cell comprising the expression vector of claim 26.

28. A hybridoma expressing the antibody or antigen binding portion thereof of any one of claims 1, 2 or 20.

29. A method of making the antibody of any one of claims 1, 2 or 20, comprising the steps of:

immunizing a transgenic animal comprising human immunoglobulin genes with a CADM1 peptide;

recovering B-cells from said transgenic animal;

making hybridomas from said B-cells;

selecting hybridomas that express antibodies that bind CADM1; and

recovering said antibodies that bind CADM1 from said selected hybridomas.

30. A method of making anti-CADM1 antibodies, comprising the steps of:

immunizing a transgenic animal comprising human immunoglobulin genes with a CADM1 peptide;

recovering mRNA from the B cells of said transgenic animal;

converting said mRNA to cDNA;

expressing said cDNA in phages such that anti-CADM1 antibodies encoded by said cDNA are presented on the surface of said phages;

selecting phages that present anti-CADM1 antibodies;

recovering nucleic acid molecules from said selected phages that encode said anti-CADM1 immunoglobulins;

expressing said recovered nucleic acid molecules in a host cell; and

recovering antibodies from said host cell that bind CADM1.

31. An isolated monoclonal antibody, or an antigen binding portion thereof, which binds an epitope on the polypeptide having an amino acid sequence of SEQ ID NOS:43 or 44 recognized by an antibody comprising a heavy chain variable region comprising the amino acid sequence set forth in SEQ ID NOS:19, 20, or 21 and a light chain variable region comprising the amino acid sequence set forth in SEQ ID NOS:22, 23, or 24.

32. An isolated monoclonal antibody, or an antigen binding portion thereof, which binds an epitope on the polypeptide having an amino acid sequence of SEQ ID NOS:43 or 44 recognized by an antibody comprising CDRs as defined in Figures 1-3, including

DNA and amino acid changes that maintain 90% of the binding to human CADM1 of the original sequences regardless of the framework upon which these CDRs are placed.

Claims:

1. An isolated monoclonal antibody, or an antigen-binding portion thereof, an antibody fragment, or an antibody mimetic which binds an epitope on human CADM1 and which comprises:

(i) a heavy chain variable region comprising the amino acid sequence set forth in SEQ ID NO: 19, 20, or 21, or an amino acid sequence having at least 85% sequence identity thereto; and

(ii) a light chain variable region comprising the amino acid sequence set forth in SEQ ID NO: 22, 23, or 24, or an amino acid sequence having at least 85% sequence identity thereto.

2. An isolated monoclonal antibody or an antigen binding portion thereof, an antibody fragment, or an antibody mimetic as claimed in claim 1 and which comprises a heavy chain variable region and a light chain variable region selected from the group consisting of:

the heavy chain variable region amino acid sequence set forth in SEQ ID NO: 19 and the light chain variable region amino acid sequence set forth in SEQ ID NO: 22;

the heavy chain variable region amino acid sequence set forth in SEQ ID NO: 20 and the light chain variable region amino acid sequence set forth in SEQ ID NO: 23; and

the heavy chain variable region amino acid sequence set forth in SEQ ID NO: 21 and the light chain variable region amino acid sequence set forth in SEQ ID NO: 24.

3. An isolated monoclonal antibody, or an antigen-binding portion thereof, an antibody fragment, or an antibody mimetic which binds an epitope on human CADM1 and which comprises:

(a) a heavy chain variable region CDR1 comprising SEQ ID NO: 1,
a heavy chain variable region CDR2 comprising SEQ ID NO: 4,
a heavy chain variable region CDR3 comprising SEQ ID NO: 7,
a light chain variable region CDR1 comprising SEQ ID NO: 10,
a light chain variable region CDR2 comprising SEQ ID NO: 13, and
a light chain variable region CDR3 comprising SEQ ID NO: 16;

or

(b) a heavy chain variable region CDR1 comprising SEQ ID NO: 2,
a heavy chain variable region CDR2 comprising SEQ ID NO: 5,

a heavy chain variable region CDR3 comprising SEQ ID NO: 8,
a light chain variable region CDR1 comprising SEQ ID NO: 11,
a light chain variable region CDR2 comprising SEQ ID NO: 14, and
a light chain variable region CDR3 comprising SEQ ID NO: 17;

or

(c) a heavy chain variable region CDR1 comprising SEQ ID NO: 3,
a heavy chain variable region CDR2 comprising SEQ ID NO: 6,
a heavy chain variable region CDR3 comprising SEQ ID NO: 9,
a light chain variable region CDR1 comprising SEQ ID NO: 12,
a light chain variable region CDR2 comprising SEQ ID NO: 15, and
a light chain variable region CDR3 comprising SEQ ID NO: 18,

optionally wherein any of SEQ ID NOs: 1-18 independently comprises one amino acid substitution, addition or deletion.

4. The antibody of any one of claims 1 to 3, wherein said antibody is a full-length antibody of an IgG1, IgG2, IgG3, or IgG4 isotype.

5. The antibody of any one of claims 1 to 3, wherein said antibody is selected from the group consisting of: a whole antibody, an antibody fragment, a humanized antibody, a human antibody, a single chain antibody, an engineered antibody resulting in increased binding to Fc receptors and/or increased potency for ADCC, and a bispecific antibody.

6. The antibody fragment of claim 5, wherein the fragment is selected from the group consisting of: a UniBody, a domain antibody, and a Nanobody.

7. The antibody mimetic of any one of claims 1 to 3, wherein the mimetic is selected from the group consisting of: an Affibody, a DARPin, an Anticalin, an Avimer, a Versabody, and a Duocalin.

8. The antibody of any one of claims 1 to 3, which is conjugated to a therapeutic agent.

9. The antibody of claim 8, wherein the therapeutic agent is a cytotoxin or a radioactive isotope.

10. The isolated antibody of any one of claims 1 to 3, wherein said antibody binds to human CADM1 with an EC_{50} in the range of < 50 nM.

11. The isolated antibody of any one of claims 1 to 3, wherein said antibody binds to human CADM1 with an EC_{50} in the range of < 10 nM.

12. The isolated antibody of any one of claims 1 to 3, wherein said antibody binds to human CADM1 with an EC_{50} in the range of < 1 nM.

13. A composition comprising the isolated antibody or antigen-binding portion thereof of any one of claims 1 to 12 and a pharmaceutically acceptable carrier.

14. An isolated nucleic acid molecule encoding the heavy or light chain of the antibody or antigen-binding portion thereof of any one of claims 1 to 3.

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

16. A host cell comprising the expression vector of claim 15.

17. A method for preparing an anti-CADM1 antibody, said method comprising the steps of:

obtaining a host cell that contains one or more nucleic acid molecules encoding the antibody of any one of claims 1 to 3;

growing the host cell in a host cell culture;

providing host cell culture conditions wherein the one or more nucleic acid molecules are expressed; and

recovering the antibody from the host cell or from the host cell culture.

18. A hybridoma expressing the antibody or antigen binding portion thereof of any one of claims 1 to 3.

19. A method of making the antibody of any one of claims 1 to 3, comprising the steps of:

immunizing a transgenic animal comprising human immunoglobulin genes with a CADM1 peptide;

recovering B-cells from said transgenic animal;

making hybridomas from said B-cells;

selecting hybridomas that express antibodies that bind CADM1; and

recovering said antibodies that bind CADM1 from said selected hybridomas.

20. A method of making anti-CADM1 antibodies as defined in any one of claims 1 to 3, comprising the steps of:

immunizing a transgenic animal comprising human immunoglobulin genes with a CADM1 peptide;

recovering mRNA from the B cells of said transgenic animal;

converting said mRNA to cDNA;

expressing said cDNA in phages such that anti-CADM1 antibodies encoded by said cDNA are presented on the surface of said phages;

selecting phages that present anti-CADM1 antibodies;

recovering nucleic acid molecules from said selected phages that encode said anti-CADM1 immunoglobulins;

expressing said recovered nucleic acid molecules in a host cell; and

recovering antibodies from said host cell that bind CADM1.