Claims

1. A radioactive metal-labeled anti-cadherin antibody, which is obtained by binding a radioactive metallic element to an anti-cadherin antibody via a metal-chelating reagent.

2. The radioactive metal-labeled anti-cadherin antibody according to claim 1, wherein the anti-cadherin antibody can bind to a region from 1 to 655 of SEQ ID NO: 2.

3. The radioactive metal-labeled anti-cadherin antibody according to claim 1 or 2, wherein the anti-cadherin antibody is a monoclonal antibody.

4. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 3, wherein the anti-cadherin antibody is selected from the group consisting of a chimeric antibody, a humanized antibody, and a human antibody.

5. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 4, wherein the anti-cadherin antibody is a monoclonal antibody or a recombinant antibody produced by an antibody-producing cell represented by an accession number of NITE BP-897, NITE BP-898, NITE BP-899, NITE BP-1034, NITE BP-1035, NITE BP-1036, NITE BP-1037, NITE BP-1038, NITE BP-1039, NITE BP-1040, NITE BP-1041, NITE BP-1042, NITE BP-1043, NITE BP-1044, NITE BP-1045, NITE BP-1046, NITE BP-1047, NITE BP-1048, NITE BP-1049, or NITE BP-1050, or a fragment of any of these antibodies.

6. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 3, wherein the anti-

cadherin antibody is a monoclonal antibody or a recombinant antibody produced by an antibody-producing cell represented by an accession number of NITE BP-897, NITE BP-898, NITE BP-899, NITE BP-1034, NITE BP-1035, NITE BP-1036, NITE BP-1037, NITE BP-1038, NITE BP-1039, or NITE BP-1040, or a fragment of any of these antibodies.

7. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 4, wherein the anti-cadherin antibody is a chimeric antibody, a humanized antibody, or a fragment of any of these antibodies produced by modifying a monoclonal antibody as recited in claim 6.

8. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 4, wherein the anti-cadherin antibody is an antibody having a VH domain and/or a VL domain formed of an amino acid sequence having a sequence identity of 90% or higher to the amino acid sequence of the VH domain and/or the VL domain of a monoclonal antibody as recited in claim 6, or a fragment thereof.

9. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 8, wherein the metal-chelating reagent is selected from the group consisting of isothiocyanobenzyl DOTA, methylisothiocyanobenzyl DTPA, and cyclohexylisothiocyanobenzyl DTPA.

10. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 9, wherein a mole ratio of the anti-cadherin antibody to the metal-chelating reagent is 1 : 0.1 to 1 : 4.5.

11. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 9, wherein a mole ratio of the anti-cadherin antibody to the metal-chelating reagent is 1 : 0.5 to 1 : 3.

12. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 11, wherein the radioactive metallic element is a cytotoxic radioactive metal used in cancer therapy.

13. The radioactive metal-labeled anti-cadherin antibody according to claim 12, wherein the cytotoxic radioactive metal is selected from the group consisting of yttrium-90 (^{90}Y), rhenium-186 (^{186}Re), rhenium-188 (^{188}Re), copper-67 (^{67}Cu), iron-59 (^{59}Fe), strontium-89 (^{89}Sr), gold-198 (^{198}Au), dysprosium-165 (^{165}Dy), ruthenium-103 (^{103}Ru), holmium-166 (^{166}Ho), samarium-153(^{153}Sm), and lutetium-177 (^{177}Lu).

14. The radioactive metal-labeled anti-cadherin antibody according to claim 12 or 13, wherein the cytotoxic radioactive metal is yttrium-90 (^{90}Y).

15. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 12 to 14, wherein the cancer therapy is targeted to a cadherin-expressing cancer.

16. The radioactive metal-labeled anti-cadherin antibody according to any one of claims 1 to 11, wherein the radioactive metallic element is a non-cytotoxic radioactive metal used in cancer diagnosis.

17. The radioactive metal-labeled anti-cadherin antibody according to claim 16, wherein the non-cytotoxic

radioactive metal is selected from the group consisting of technetium-99m (^{99m}Tc), indium-111 (^{111}In), indium-113m (^{113m}In), gallium-67 (^{67}Ga), gallium-68 (^{68}Ga), thallium-201 (^{201}Tl), cobalt-57 (^{57}Co), strontium-85 (^{85}Sr), and copper-64 (^{64}Cu).

18. The radioactive metal-labeled anti-cadherin antibody according to claim 16 or 17, wherein the non-cytotoxic radioactive metal is selected from indium-111 (^{111}In) and gallium-67 (^{67}Ga).

19. A cancer therapeutic agent containing, as an active ingredient, the radioactive metal-labeled anti-cadherin antibody as recited in any one of claims 12 to 15.

20. A cancer diagnostic agent containing, as an active ingredient, the radioactive metal-labeled anti-cadherin antibody as recited in any one of claims 16 to 18.

21. An antibody-producing cell which is deposited as an accession number of NITE BP-897, NITE BP-898, NITE BP-899, NITE BP-1034, NITE BP-1035, NITE BP-1036, NITE BP-1037, NITE BP-1038, NITE BP-1039, NITE BP-1040, NITE BP-1041, NITE BP-1042, NITE BP-1043, NITE BP-1044, NITE BP-1045, NITE BP-1046, NITE BP-1047, NITE BP-1048, NITE BP-1049, or NITE BP-1050.

22. The radioactive metal-labeled anti-cadherin antibody as recited in any one of claims 12 to 15 for use in cancer therapy.

23. The radioactive metal-labeled anti-cadherin antibody as recited in any one of claims 16 to 18 for use in cancer diagnosis.

24. Use of the radioactive metal-labeled anti-cadherin

antibody as recited in any one of claims 12 to 15 for producing a cancer therapeutic agent.

25. Use of the radioactive metal-labeled anti-cadherin antibody as recited in any one of claims 16 to 18 for producing a cancer diagnostic agent.

26. A cancer treatment method comprising administering an effective amount of the radioactive metal-labeled anti-cadherin antibody as recited in any one of claims 12 to 15 to a subject in need thereof.

27. A cancer diagnosis method comprising administering an effective amount of the radioactive metal-labeled anti-cadherin antibody as recited in any one of claims 16 to 18 to a subject in need thereof.

CLAIMS

1. A radioactive metal-labeled anti-p-cadherin antibody, obtained by a process comprising binding a radioactive metallic element to an anti-p-cadherin antibody via a metal-chelating reagent,

wherein the anti-p-cadherin antibody is a monoclonal antibody produced by an antibody-producing cell of an accession number of NITE BP-897, NITE BP-898, NITE BP-899 or NITE BP-1040, or a recombinant antibody thereof or a chimeric antibody thereof or a humanized antibody thereof.

2. The radioactive metal-labeled anti-p-cadherin antibody of claim 1, wherein the anti-p-cadherin antibody is a monoclonal antibody, produced by an antibody-producing cell of an accession number of NITE BP-897, NITE BP-898, NITE BP-899, NITE BP-1040, NITE BP-1044, NITE BP-1048, NITE BP-1049, or NITE BP-1050, or a recombinant antibody thereof.

3. The radioactive metal-labeled anti-p-cadherin antibody of claim 1, wherein the metal-chelating reagent is selected from the group consisting of isothiocyanobenzyl DOTA, methylisothiocyanobenzyl DTPA, and cyclohexylisothiocyanobenzyl DTPA.

4. The radioactive metal-labeled anti-p-cadherin antibody of claim 1, wherein a mole ratio of the anti-p-cadherin antibody to the metal-chelating reagent is from 1:0.1 to 1:4.5.

5. The radioactive metal-labeled anti-p-cadherin antibody of claim 4, wherein the mole ratio of the anti-p-cadherin antibody to the metal-chelating reagent is from 1:0.5 to 1:3.

6. The radioactive metal-labeled anti-p-cadherin antibody of claim 1, wherein the radioactive metallic element is a cytotoxic radioactive metal suitable for treating a p-cadherin expressing cancer.

7. The radioactive metal-labeled anti-p-cadherin antibody of claim 6, wherein the cytotoxic radioactive metal is selected from the group consisting of yttrium-90 (^{90}Y), rhenium-186 (^{186}Re), rhenium-188 (^{188}Re), copper-67 (^{67}Cu), iron-59 (^{59}Fe), strontium-89 (^{89}Sr), gold-198 (^{198}Au), dysprosium-165 (^{165}Dy), ruthenium-103 (^{103}Ru), holmium-166 (^{166}Ho), samarium-153(^{153}Sm), and lutetium-177 (^{177}Lu).

8. The radioactive metal-labeled anti-p-cadherin antibody of claim 6, wherein the cytotoxic radioactive metal is yttrium-90 (^{90}Y).

9. The radioactive metal-labeled anti-p-cadherin antibody of claim 6, wherein the cancer therapy is suitable for treating a p-cadherin-expressing cancer.

10. The radioactive metal-labeled anti-p-cadherin antibody of claim 1, wherein the radioactive metallic element is a non-cytotoxic radioactive metal suitable for diagnosing p-cadherin expressing cancer.

11. The radioactive metal-labeled anti-p-cadherin antibody of claim 10, wherein the non-cytotoxic radioactive metal is selected from the group consisting of technetium-99m (^{99m}Tc), indium-111 (^{111}In), indium-113m (^{113m}In), gallium-67 (^{67}Ga), gallium-68 (^{68}Ga), thallium-201 (^{201}Tl), cobalt-57 (^{57}Co), strontium-85 (^{85}Sr), and copper-64 (^{64}Cu).

12. The radioactive metal-labeled anti-p-cadherin antibody of claim 10, wherein the non-cytotoxic radioactive metal is indium-111 (^{111}In) or copper-64 (^{64}Cu).

13. A p-cadherin expressing cancer therapeutic agent comprising, as an active ingredient, the radioactive metal-labeled anti-p-cadherin antibody of claim 6.

14. A p-cadherin expressing cancer diagnostic agent comprising, as an active ingredient, the radioactive metal-labeled anti-p-cadherin antibody of claim 10.

15. An antibody-producing cell deposited as an accession number of NITE BP-897, NITE BP-898, NITE BP-899, NITE BP-1040, NITE BP-1044, NITE BP-1048, NITE BP-1049, or NITE BP-1050.

16. A metal chelating reagent-binding anti-p-cadherin antibody, obtained by a process comprising binding a metal-chelating reagent to an anti-p-cadherin antibody, wherein the anti-p-cadherin antibody is a monoclonal antibody produced by an antibody-producing cell of an accession number of NITE BP-897, NITE BP-898, NITE BP-899, or NITE BP-1040, or a recombinant antibody thereof or a chimeric antibody thereof or a humanized antibody thereof.

17. The metal-chelating reagent-binding anti-p-cadherin antibody of claim 16, wherein the anti-p-cadherin antibody is a monoclonal antibody produced by an antibody-producing cell of an accession number of NITE BP-897, NITE BP-898, NITE BP-899, NITE

BP-1040, NITE BP-1044, NITE BP-1048, NITE BP-1049, or NITE BP-1050, or a recombinant antibody thereof.

18. The metal-chelating reagent-binding anti-p-cadherin antibody of claim 16, wherein the metal-chelating reagent is selected from the group consisting of isothiocyanobenzyl DOTA, methylisothiocyanobenzyl DTPA, and cyclohexylisothiocyanobenzyl DTPA.

19. The metal-chelating reagent-binding anti-p-cadherin antibody of claim 16, wherein a mole ratio of the anti-p-cadherin antibody to the metal-chelating reagent is from 1 : 0.1 to 1 : 4.5.

20. The metal-chelating reagent-binding anti-p-cadherin antibody of claim 19, wherein the mole ratio of the anti-p-cadherin antibody to the metal-chelating reagent is from 1 : 0.5 to 1 : 3.

21. An anti-p-cadherin antibody which is a monoclonal antibody produced by an antibody-producing cell of an accession number of NITE BP-897, NITE BP-898, NITE BP-899, or NITE BP-1040, or a recombinant antibody thereof or a chimeric antibody thereof or a humanized antibody thereof.

22. An anti-p-cadherin antibody which is a monoclonal antibody produced by an antibody-producing cell of an accession number of NITE BP-897, NITE BP-898, NITE BP-899, NITE BP-1040, NITE BP-1044, NITE BP-1048, NITE BP-1049, or NITE BP-1050 or a recombinant antibody thereof.

23. A method of diagnosing a p-cadherin expressing cancer, comprising:

administering an effective amount of the radioactive metal-labeled anti-cadherin antibody of claim 10 to a subject in need thereof; and

diagnosing the p-cadherin expressing cancer.