Statements of invention

1. An antibody which comprises:

(i) an antibody heavy chain comprising an antibody heavy chain sequence selected from SEQ ID NOs: 34, 36, 38 and 40 or a variant thereof, preferably SEQ ID NO: 36 or a variant thereof, and

(ii) an antibody light chain comprising an antibody light chain sequence selected from SEQ ID NOs: 35, 37, 39, 41, 54 and 55 or a variant thereof, preferably SEQ ID NO: 35 or a variant thereof.

2. The antibody of claim 1 which comprises:

(i) an antibody heavy chain comprising an antibody heavy chain sequence of SEQ ID NO: 36 or a variant thereof, and

(ii) an antibody light chain comprising an antibody light chain sequence selected from SEQ ID NOs: 35, 54 and 55 or a variant thereof.

3. The antibody of claim 1 which comprises:

(i) an antibody heavy chain comprising an antibody heavy chain sequence of SEQ ID NO: 36 or a variant thereof, and

(ii) an antibody light chain comprising an antibody light chain sequence selected from SEQ ID NOs: 54 and 55 or a variant thereof.

4. The antibody of claim 1 which comprises:

(i) an antibody heavy chain comprising an antibody heavy chain sequence of SEQ ID NO: 36 or a variant thereof, and

(ii) an antibody light chain comprising an antibody light chain sequence of SEQ ID NO: 35 or a variant thereof.

5. The antibody of any one of claims 1 to 4 which is capable of binding to CLDN6 associated with the surface of a cell that expresses CLDN6 and is not substantially capable of binding to CLDN9 associated with the surface of a cell that expresses CLDN9.

6. The antibody of any one of claims 1 to 5, which is not substantially capable of binding to CLDN4 associated with the surface of a cell that expresses CLDN4 and/or is not

substantially capable of binding to CLDN3 associated with the surface of a cell that expresses CLDN3.

7. The antibody of any one of claims 1-6, which is specific for CLDN6.

8. The antibody of any one of claims 1-7, wherein said cell is an intact cell, in particular a non-permeabilized cell.

9. The antibody of any one of claims 1-8, which is capable of binding to an epitope loacted within an extracellular portion of CLDN6.

10. The antibody of any one of claims 1-9, wherein CLDN6 has the amino acid sequence of SEQ ID NO: 2 or the amino acid sequence of SEQ ID NO: 8.

11. The antibody of any one of claims 1-10, which has one or more of the following activities:
(i) killing of a cell expressing CLDN6,
(ii) inhibition of proliferation of a cell expressing CLDN6,
(iii) inhibition of colony formation of a cell expressing CLDN6,
(iv) mediating remission of established tumors,
(v) preventing formation or re-formation of tumors, and
(vi) inhibition of metastasis of a cell expressing CLDN6.

12. The antibody of any one of claims 1-11, which exhibits one or more immune effector functions against a cell carrying CLDN6 in its native conformation.

13. The antibody of claim 12, wherein the one or more immune effector functions are selected from the group consisting of complement dependent cytotoxicity (CDC), antibody-dependent cell-mediated cytotoxicity (ADCC), induction of apoptosis, and inhibition of proliferation, preferably the effector functions are ADCC and/or CDC.

14. The antibody of any one of claims 11-13, wherein said one or more activities or one or more immune effector functions are induced by binding of said antibody to an epitope located within an extracellular portion of CLDN6.

15. The antibody of any one of claims 1-14, wherein said cell expressing CLDN6 or cell carrying CLDN6 in its native conformation is a tumor cell.

16. The antibody of any one of claims 1-15, wherein said cell expressing CLDN6 or cell carrying CLDN6 in its native conformation is a cancer cell.

17. The antibody of claim 16, wherein the cancer cell is from a cancer selected from the group consisting of ovarian cancer, in particular ovarian adenocarcinoma and ovarian teratocarcinoma, lung cancer, including small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC), in particular squamous cell lung carcinoma and adenocarcinoma, gastric cancer, breast cancer, hepatic cancer, pancreatic cancer, skin cancer, in particular basal cell carcinoma and squamous cell carcinoma, malignant melanoma, head and neck cancer, in particular malignant pleomorphic adenoma, sarcoma, in particular synovial sarcoma and carcinosarcoma, bile duct cancer, cancer of the urinary bladder, in particular transitional cell carcinoma and papillary carcinoma, kidney cancer, in particular renal cell carcinoma including clear cell renal cell carcinoma and papillary renal cell carcinoma, colon cancer, small bowel cancer, including cancer of the ileum, in particular small bowel adenocarcinoma and adenocarcinoma of the ileum, testicular embryonal carcinoma, placental choriocarcinoma, cervical cancer, testicular cancer, in particular testicular seminoma, testicular teratoma and embryonic testicular cancer, uterine cancer, a germ cell tumor such as a teratocarcinoma or an embryonal carcinoma, in particular a germ cell tumor of the testis, and the metastatic forms thereof.

18. The antibody of any one of claims 1-17, which is a monoclonal, chimeric, human or humanized antibody, or a fragment of an antibody.

19. The antibody of any one of claims 1-18, which is capable of binding to one or more epitopes of CLDN6 in their native conformation.

20. A conjugate comprising an antibody of any one of claims 1-19 coupled to a therapeutic agent.

21. The conjugate of claim 20, wherein the therapeutic agent is a toxin, a radioisotope, a drug or a cytotoxic agent.

22. A pharmaceutical composition comprising the antibody of any one of claims 1-19 and/or a conjugate of claim 20 or 21, and a pharmaceutically acceptable carrier.

23. A method of inhibiting growth of a cell expressing CLDN6 and being characterized by association of CLDN6 with its cell surface, comprising contacting the cell with an antibody of any one of claims 1-19 and/or a conjugate of claim 20 or 21.

24. A method of killing a cell expressing CLDN6 and being characterized by association of CLDN6 with its cell surface, comprising contacting the cell with an antibody of any one of claims 1-19 and/or a conjugate of claim 20 or 21.

25. A method of treating or preventing a disease or disorder involving a cell expressing CLDN6 and being characterized by association of CLDN6 with its cell surface in a subject, comprising administering to said subject an antibody of any one of claims 1-19, a conjugate of claim 20 or 21 or a pharmaceutical composition of claim 22.

26. The method of claim 25, wherein the disease or disorder is a tumor-related disease.

27. The method of claim 26, wherein the tumor-related disease is cancer.

28. The method of claim 27, wherein the cancer is selected from the group consisting of ovarian cancer, in particular ovarian adenocarcinoma and ovarian teratocarcinoma, lung cancer, including small cell lung cancer (SCLC) and non-small cell lung cancer (NSCLC), in particular squamous cell lung carcinoma and adenocarcinoma, gastric cancer, breast cancer, hepatic cancer, pancreatic cancer, skin cancer, in particular basal cell carcinoma and squamous cell carcinoma, malignant melanoma, head and neck cancer, in particular malignant pleomorphic adenoma, sarcoma, in particular synovial sarcoma and carcinosarcoma, bile duct cancer, cancer of the urinary bladder, in particular transitional cell carcinoma and papillary carcinoma, kidney cancer, in particular renal cell carcinoma including clear cell renal cell carcinoma and papillary renal cell carcinoma, colon cancer, small bowel cancer, including cancer of the ileum, in particular small bowel adenocarcinoma and adenocarcinoma of the

ileum, testicular embryonal carcinoma, placental choriocarcinoma, cervical cancer, testicular cancer, in particular testicular seminoma, testicular teratoma and embryonic testicular cancer, uterine cancer, a germ cell tumor such as a teratocarcinoma or an embryonal carcinoma, in particular a germ cell tumor of the testis, and the metastatic forms thereof.

29. A method of inhibiting metastatic spread of a cell expressing CLDN6 and being characterized by association of CLDN6 with its cell surface, comprising contacting the cell with an antibody of any one of claims 1-19 and/or a conjugate of claim 20 or 21.

Claims

1. A monoclonal antibody selected from the group consisting of AB3-1, AE1-16, AE49-11, and AE3-20.