

[0008] Targeting Claudin-6 for antibody-based immunotherapy antibodies can modulate the activity of CLDN6 and/or direct a cytotoxic response against CLDN6 expressing cancer. Thus, there is a need for anti-CLDN6 antibodies.

SUMMARY

[0009] The present disclosure addresses the above need by providing anti-CLDN6 antibodies and fragments that are capable of binding to Claudin-6 present on cancer cells. These antibodies and fragments thereof are characterized by unique sets of CDR sequences, specificity for CLDN6 and are useful in cancer detection, prognosis and immunotherapy. More specifically, the disclosure relates to antibodies that bind to human CLDN6, and to their use to detect the presence of CLDN-6 expressing tumor cells and/or tumor stem cells, to modulate a CLDN6-mediated activity of cells localized to the tumor microenvironment or to direct a cytotoxic response against CLDN6 expressing cancer.

[0009a] In one aspect, the present disclosure provides an anti-CLDN6 antibody comprising: (a) (i) VH: CDR1: SEQ ID NO: 5, CDR2: SEQ ID NO: 6, CDR3: SEQ ID NO: 7, VL: CDR1: SEQ ID NO: 8, CDR2: SEQ ID NO: 9, CDR3: SEQ ID NO: 10; (b) VH: CDR1: SEQ ID NO: 11, CDR2: SEQ ID NO: 12, CDR3: SEQ ID NO: 13, VL: CDR1: SEQ ID NO: 14, CDR2: SEQ ID NO: 15, CDR3: SEQ ID NO: 16; (c) VH: CDR1: SEQ ID NO: 32, CDR2: SEQ ID NO: 33, CDR3: SEQ ID NO: 34, VL: CDR1: SEQ ID NO: 35, CDR2: SEQ ID NO: 36, CDR3: SEQ ID NO: 37; (d) VH: CDR1: SEQ ID NO: 38, CDR2: SEQ ID NO: 39, CDR3: SEQ ID NO: 40, VL: CDR1: SEQ ID NO: 41, CDR2: SEQ ID NO: 42, CDR3: SEQ ID NO: 43; (e) VH: CDR1: SEQ ID NO: 38, CDR2: SEQ ID NO: 44, CDR3: SEQ ID NO: 40, VL: CDR1: SEQ ID NO: 41, CDR2: SEQ ID NO: 45, CDR3: SEQ ID NO: 43; and (f) VH: CDR1: SEQ ID NO: 46, CDR2: SEQ ID NO: 47, CDR3: SEQ ID NO: 48, VL: CDR1: SEQ ID NO: 49, CDR2: SEQ ID NO: 50, CDR3: SEQ ID NO: 51.

[0009b] In another aspect, the present disclosure provides a pharmaceutical composition comprising as an active ingredient, at least one antibody as disclosed herein and a pharmaceutically acceptable carrier.

[0009c] In another aspect, the present disclosure provides a pharmaceutical composition comprising as an active ingredient, an antibody as disclosed herein and a pharmaceutically acceptable carrier.

[0009d] In another aspect, the present disclosure provides the pharmaceutical composition as disclosed herein for use in therapy.

[0009e] In another aspect, the present disclosure provides the use of a pharmaceutical composition as disclosed herein in the manufacture of a medicament for treating cancer.

[0009f] In another aspect, the present disclosure provides a method of determining an expression pattern of CLDN6 in a biological sample, the method comprising contacting the biological sample with an antibody or antibody fragment as disclosed herein.

[0009g] In another aspect, the present disclosure provides an isolated polynucleotide comprising a sequence encoding an anti-CLDN6 antibody as disclosed herein.

[0009h] In another aspect, the present disclosure provides an isolated polynucleotide as disclosed herein encoding a sequence as set forth in any one of SEQ ID NOs: 1 to 4.

[0009i] In another aspect, the present disclosure provides a vector comprising a polynucleotide as disclosed herein.

[0009j] In another aspect, the present disclosure provides a host cell comprising a polynucleotide as disclosed herein, and/or a vector as disclosed herein.

[0009k] In another aspect, the present disclosure provides a method for the production of an anti-CLDN6 antibody as disclosed herein, the method comprising culturing the host cell as disclosed herein.

[0010] According to some ~~embodiment~~examples, the antibody or antibody fragments comprise a set of six complementarity determining region (CDRs) sequences selected from the group consisting of three CDRs of a heavy chain (HC) variable region selected from SEQ ID NOs: 1, 3, 23, 24, 26, 28 and 30, and three light CDRs of a light chain (LC) variable region selected from SEQ ID NOs: 2, 4, 25, 27, 29 and 31 or an analog or derivative thereof having at least 90% sequence identity with the identified antibody or fragment sequence.

[0011] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a heavy chain variable region comprising CDR1: SEQ ID NO: 5, CDR2: SEQ ID NO: 6 and CDR3: SEQ ID NO: 7; and/or a light chain variable region comprising CDR1: SEQ ID NO: 8, CDR2: SEQ ID NO: 9, and CDR3: SEQ ID NO: 10.

[0012] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a heavy chain variable region comprising CDR1: SEQ ID NO: 11, CDR2: SEQ ID NO: 12, and CDR3: SEQ ID NO: 13; and/or a light chain variable region comprising CDR1: SEQ ID NO: 14, CDR2: SEQ ID NO: 15, and CDR3: SEQ ID NO: 16.

[0013] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a heavy chain variable region comprising CDR1: SEQ ID NO: 32, CDR2: SEQ

ID NO: 33 and CDR3: SEQ ID NO: 34; and/or a light chain variable region comprising CDR1: SEQ ID NO: 35, CDR2: SEQ ID NO: 36, and CDR3: SEQ ID NO: 37.

[0014] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a heavy chain variable region comprising CDR1: SEQ ID NO: 38, CDR2: SEQ ID NO: 39 and CDR3: SEQ ID NO: 40; and/or a light chain variable region comprising CDR1: SEQ ID NO: 41, CDR2: SEQ ID NO: 42, and CDR3: SEQ ID NO: 43.

[0015] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a heavy chain variable region comprising CDR1: SEQ ID NO: 38, CDR2: SEQ ID NO: 44 and CDR3: SEQ ID NO: 40; and/or a light chain variable region comprising CDR1: SEQ ID NO: 41, CDR2: SEQ ID NO: 45, and CDR3: SEQ ID NO: 43.

[0016] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a heavy chain variable region comprising CDR1: SEQ ID NO: 46, CDR2: SEQ ID NO: 47 and CDR3: SEQ ID NO: 48; and/or a light chain variable region comprising CDR1: SEQ ID NO: 49, CDR2: SEQ ID NO: 50, and CDR3: SEQ ID NO: 51.

[0017] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a variable heavy chain sequence selected from the group consisting of SEQ ID NOs: 1, 3, 23, 24, 26, 28 and 30.

[0018] In other ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a variable light chain sequence selected from the group consisting of SEQ ID NOs: 2, 4, 25, 27, 29 and 31.

[0019] In other ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof comprise a variable heavy chain sequence selected from the group consisting of SEQ ID NOs: 1, 3, 23, 24, 26, 28 and 30 and a variable light chain sequence selected from the group consisting of SEQ ID NOs: 2, 4, 25, 27, 29 and 31.

[0020] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragment comprises a variable heavy chain and variable light chain sequence, selected from the following combinations:

- (a) a variable heavy chain sequence comprising SEQ ID NO: 1 and a variable light chain sequence comprising SEQ ID NO: 2;
- (b) a variable heavy chain sequence comprising SEQ ID NO: 3 and a variable light chain sequence comprising SEQ ID NO: 4
- (c) a variable heavy chain sequence comprising SEQ ID NO: 23 and a variable light chain sequence comprising SEQ ID NO: 2;
- (d) a variable heavy chain sequence comprising SEQ ID NO: 24 and a variable light chain sequence comprising SEQ ID NO: 25;
- (e) a variable heavy chain sequence comprising SEQ ID NO: 26 and a variable light chain sequence comprising SEQ ID NO: 27;
- (f) a variable heavy chain sequence comprising SEQ ID NO: 28 and a variable light chain sequence comprising SEQ ID NO: 29; and
- (g) a variable heavy chain sequence comprising SEQ ID NO: 30 and a variable light chain sequence comprising SEQ ID NO: 31.

[0021] In some ~~embodiment~~examples, an immunoconjugate comprising an antibody that binds CLDN6 covalently attached to a cytotoxic agent is provided, wherein the antibody comprises a variable heavy chain and a variable light chain sequences, selected from the following combinations:

- (a) a variable heavy chain sequence comprising SEQ ID NO: 1 and a variable light chain sequence comprising SEQ ID NO: 2; and
- (b) a variable heavy chain sequence comprising SEQ ID NO: 3 and a variable light chain sequence comprising SEQ ID NO: 4
- (c) a variable heavy chain sequence comprising SEQ ID NO: 23 and a variable light chain sequence comprising SEQ ID NO: 2;
- (d) a variable heavy chain sequence comprising SEQ ID NO: 24 and a variable light chain sequence comprising SEQ ID NO: 25;
- (e) a variable heavy chain sequence comprising SEQ ID NO: 26 and a variable light chain sequence comprising SEQ ID NO: 27;
- (f) a variable heavy chain sequence comprising SEQ ID NO: 28 and a variable light chain sequence comprising SEQ ID NO: 29; and

(g) a variable heavy chain sequence comprising SEQ ID NO: 30 and a variable light chain sequence comprising SEQ ID NO: 31.

[0022] In some ~~embodiment~~examples, an immunoconjugate comprising an antibody that binds Claudin-6 covalently attached to a cytotoxic agent is provided, wherein the antibody comprises (a) a heavy chain variable region comprising CDR1: SEQ ID NO: 5, CDR2: SEQ ID NO: 6, and CDR3: SEQ ID NO: 7; and/or a light chain variable region comprising CDR1: SEQ ID NO: 8, CDR2: SEQ ID NO: 9, and CDR3: SEQ ID NO: 10; (b) a heavy chain variable region comprising CDR1: SEQ ID NO: 11, CDR2: SEQ ID NO: 12, and CDR3: SEQ ID NO: 13; and/or a light chain variable region comprising CDR1: SEQ ID NO: 14, CDR2: SEQ ID NO: 15, and CDR3: SEQ ID NO: 16; (c) a heavy chain variable region comprising CDR1: SEQ ID NO: 32, CDR2: SEQ ID NO: 33, and CDR3: SEQ ID NO: 34; and/or a light chain variable region comprising CDR1: SEQ ID NO: 35, CDR2: SEQ ID NO: 36, and CDR3: SEQ ID NO: 37; (d) a heavy chain variable region comprising CDR1: SEQ ID NO: 38, CDR2: SEQ ID NO: 39, and CDR3: SEQ ID NO: 40; and/or a light chain variable region comprising CDR1: SEQ ID NO: 41, CDR2: SEQ ID NO: 42, and CDR3: SEQ ID NO: 43; (e) a heavy chain variable region comprising CDR1: SEQ ID NO: 38, CDR2: SEQ ID NO: 44, and CDR3: SEQ ID NO: 40; and/or a light chain variable region comprising CDR1: SEQ ID NO: 41, CDR2: SEQ ID NO: 45, and CDR3: SEQ ID NO: 43; and (f) a heavy chain variable region comprising CDR1: SEQ ID NO: 46, CDR2: SEQ ID NO: 47, and CDR3: SEQ ID NO: 48; and/or a light chain variable region comprising CDR1: SEQ ID NO: 49, CDR2: SEQ ID NO: 50, and CDR3: SEQ ID NO: 51.

[0023] In some ~~embodiment~~examples, the anti-CLDN6 antibodies and antibody fragments thereof comprise one or more heavy chain variable region CDRs disclosed in Table 1 and/or one or more light chain variable region CDRs disclosed in Table 2.

[0024] In some ~~embodiment~~examples, the anti-CLDN6 antibodies or antibody fragments thereof exhibit one or more of the following structural and functional characteristics, alone or in combination: (a) bind to cells expressing human CLDN6 on their cell surface; (b) selectively bind to Claudin-6 CHO-K1 cells with a signal (e.g., MFI) that is approximately 20 to 25- fold greater than the binding activity of an isotype control antibody for CLDN6 expressed on Claudin-6-CHO-K1 cells, or 20 to 30 -fold greater than the binding activity

of an isotype control antibody for CLDN6 expressed on Claudin-6-HEK293 cell and to Claudin-9 HEK293 cells with a signal that is only 16-fold greater than the binding activity of an isotype control antibody; (c) bind to Claudin-6 (Claudin-6 CHO-K1 cells) and Claudin-9 (HEK293 cells) expressing cells equally with a signal that it at approximately 25 to 60 fold greater than the binding activity of an isotype control antibody; (d) binds weakly or not at all to cells expressing CLDN3, CLDN4; (e) bind to NEC8 cells endogenously expressing Claudin-6, but do not bind to NEC8 cells with a knockout of the Claudin 6 gene; (f) optionally cross-react with murine CLDN6; (g) are efficiently internalized from the surface of Claudin-6 positive cells after binding and induce endocytosis-mediated cell cytotoxicity in NEC8 cells endogenously expressing Claudin-6; and (h) exhibit one or more immune effector functions against a cell carrying CLDN6 in its native conformation, wherein the one or more immune effector functions is selected antibody-dependent cell-mediated cytotoxicity (ADCC), T cell dependent cellular cytotoxicity (TDCC), complement dependent cytotoxicity (CDC), or antibody-dependent cellular phagocytosis (ADCP).

[0025] In some embodimentexamples, the anti-CLDN6 antibodies specifically bind to human cells expressing endogenous levels of Claudin-6 and to host cells engineered to overexpress Claudin-6, and do not demonstrate binding to Claudin-3 or Claudin-4. In one embodimentexample, the anti-CLDN6 antibodies bind endogenously expressed CLDN6 on human testicular embryonal carcinoma (NEC8 cells). In some embodimentexamples, the anti-CLDN6 antibodies bind endogenously expressed CLDN6 on human ovarian carcinoma (OV90 cells). In some embodimentexamples, the CLDN6-specific antibodies or antibody fragments bind human Claudin-6 with an affinity below 100 nM. In other embodimentexamples, the CLDN6/9-specific antibodies or antibody fragments selectively bind to human CLDN6 and human CLDN9.

[0026] In some embodimentexamples the antibodies are capable of binding to CLDN6 associated with the surface of a cell that expresses CLDN6. Preferably, the CLDN6-expressing cell is an intact cell, in particular a non-permeabilized cell, and the CLDN6 protein bound by the antibodies is associated with the surface of a cell has a native, e.g., non-denatured, conformation. In a particular embodimentexample, the antibodies are not substantially capable of: binding to CLDN9 associated with the surface of a cell that expresses CLDN9; or binding

to CLDN4 associated with the surface of a cell that expresses CLDN4 and/or binding to CLDN3 associated with the surface of a cell that expresses CLDN3.

[0027] In one embodimentexample, the anti-CLDN6 antibodies or antibody fragments selectively bind to CLDN6 relative to CLDN9 and do not bind to Claudin-3 (CLDN3), Claudin-4 (CLDN4). In another embodimentexample, the anti-CLDN6 antibodies or antibody fragments bind to both CLDN6 and CLDN 9 equally (e.g., no preference for either CLDN). In some embodimentexamples the antibodies exhibit an EC₅₀ of less than about 50 nM (e.g., less than about 75 nM, less than about 50 nM, less than about 25 nM, less than about 10 nM) in a FACS-based assay using either host cells engineered to over express CLDN6 (e.g., 293T-CLDN6 or CHO-CLDN6).

[0028] In some embodimentexamples, the antibody or fragment thereof exhibits one or more immune effector functions against a cell carrying CLDN6 in its native conformation, wherein the one or more immune effector functions are preferably selected from the group consisting of antibody-dependent cell-mediated cytotoxicity (ADCC), complement dependent cytotoxicity (CDC), induction of apoptosis, and inhibition of proliferation, preferably the effector functions are ADCC and/or CDC.

[0029] In some embodimentexamples the antibody or fragment thereof may be attached to one or more therapeutic effector moieties, e.g., radiolabels, cytotoxins, therapeutic enzymes, agents that induce apoptosis, and the like in order to provide for targeted cytotoxicity, e.g., killing of tumor cells. In one embodimentexample, an anti-CLDN6 antibody specifically binds human CLDN6 as it occurs on the surface of tumor cells and efficiently induces the internalization of CLDN6 or directs cell-mediated killing of the tumor cell.

[0030] In some embodimentexamples, an anti-CLDN6 antibody is incorporated into an immunoconjugate comprising an anti-CLDN6 antibody conjugated to one or more cytotoxic agents, such as chemotherapeutic agents or drugs, growth inhibitory agents, toxins (e.g., protein toxins, enzymatically active toxins of bacterial, fungal, plant, or animal origin, or fragments thereof), or radioactive isotopes (e.g., a radioconjugate).

[0031] In some embodimentexamples, the anti-CLDN6 antibodies or antibody fragments may comprise substitutions or modifications of the constant region (i.e. the Fc region), including without limitation, amino acid residue substitutions, mutations and/or modifications, which result in a compound with one or more enhanced ADCC, CDC, ADCCP, TDCC antibody-mediated effector functions.

[0032] In some embodimentexamples, the anti-CLDN6 antibodies or antibody fragments comprises six (6) CDRs or variants thereof, derived from the VH or VL domain of a single antiCLDN6 antibody disclosed herein. For example, a binding agent may comprise all six of the CDR regions of the anti-CLDN6 antibody designated “NR.N6.Ab1.” In a representative example, an antibody or antibody fragment thereof may comprise the amino acid sequences of SEQ ID NOs: 5 - 7 and SEQ ID NOs: 8 - 10, representing the CDR1, CDR2 and CDR3 of the variable heavy chain region and the CDR1, CDR2 and CDR3 of the variable light chain region of the anti-human CLDN6 antibody referred to herein as “NR.N6.Ab1.”

[0033] Any of the anti-CLDN6 antibodies disclosed herein may be a fully human, chimeric, CDR grafted, humanized, or recombinant antibody, or a fragment thereof. In alternative embodimentexamples, the disclosed anti-CLDN6 antibodies or antibody fragments may be developed for use in various alternative formats, including a bispecific or multi-specific format.

[0034] In some embodimentexamples, the CLDN6 antibody is a full-length antibody. In some embodimentexamples, the antibody is an antibody fragment. In further embodimentexamples, the antibody fragment is selected from the group consisting of: Fab, Fab', F(ab')₂, Fd, Fv, scFv and scFv-Fc fragment, a single-chain antibody, a minibody, and a diabody.

[0035] The disclosure also provides a nucleic acid encoding any of the anti-CLDN6 antibodies disclosed herein. In a related embodimentexample, the disclosure provides a vector comprising one or more of the nucleic acids encoding an anti-CLDN6 antibody disclosed herein or a host cell comprising said vector.

[0036] The CLDN6 antibodies and antibody fragments thereof may be used for the treatment of cancer. Cancer cells expressing CLDN6 are suitable targets for therapies targeting CLDN6 such as therapy with antibodies directed against CLDN6. Such methods for the treatment of cancer may comprise administering a composition or formulation that comprises an CLDN6 antibody or antibody fragment thereof to a subject in need thereof.

[0037] For example, the CLDN6 antibody or antibody fragment thereof may be administered either alone (e.g., as a monotherapy) or in combination with other immunotherapeutic agent and/or a chemotherapy. In an embodiment example, the CLDN6 antibody or fragment is used to prepare an ADC suitable to mediate the killing of cancer cells expressing CLDN6. In an alternative embodiment example, the CLDN6 antibody is used to engineer a recombinant antibody designed to kill tumor cells by enhanced ADCC, ADCP, TDCC, or CDD.

[0038] The disclosure also provides a method of treating cancer comprising administering to a subject in need thereof a pharmaceutical composition comprising an ADC, wherein the ADC comprises an anti-CLDN6 antibody or antibody fragment disclosed herein conjugated to a payload. In some embodiment examples, the methods comprise administering to a subject in need thereof a pharmaceutical composition comprising an anti-CLDN ADC, wherein the cancer is selected from uterine, testicular, ovarian and lung cancer.

BRIEF DESCRIPTION OF THE OF THE DRAWINGS

[0039] The foregoing summary, as well as the following detailed description of the disclosure, will be better understood when read in conjunction with the appended figures. For the purpose of illustrating the disclosure, shown in the figures are embodiments which are presently preferred. It should be understood, however, that the disclosure is not limited to the precise arrangements, examples and instrumentalities shown.

[0040] Figure 1 provides the amino acid sequences of the VH and VL domains of the human anti-Claudin-6 antibodies and their respective CDR sequences (Kabat numbering). Sequence identifiers are provided and the CDRs are underlined in the variable domain sequences.

WHAT IS CLAIMED IS:

1. An anti-CLDN6 antibody comprising:
 - (a) (i) VH: CDR1: SEQ ID NO: 5, CDR2: SEQ ID NO: 6, CDR3: SEQ ID NO: 7,
VL: CDR1: SEQ ID NO: 8, CDR2: SEQ ID NO: 9, CDR3: SEQ ID NO: 10;
 - (b) VH: CDR1: SEQ ID NO: 11, CDR2: SEQ ID NO: 12, CDR3: SEQ ID NO: 13,
VL: CDR1: SEQ ID NO: 14, CDR2: SEQ ID NO: 15, CDR3: SEQ ID NO: 16;
 - (c) VH: CDR1: SEQ ID NO: 32, CDR2: SEQ ID NO: 33, CDR3: SEQ ID NO: 34,
VL: CDR1: SEQ ID NO: 35, CDR2: SEQ ID NO: 36, CDR3: SEQ ID NO: 37;
 - (d) VH: CDR1: SEQ ID NO: 38, CDR2: SEQ ID NO: 39, CDR3: SEQ ID NO: 40,
VL: CDR1: SEQ ID NO: 41, CDR2: SEQ ID NO: 42, CDR3: SEQ ID NO: 43;
 - (e) VH: CDR1: SEQ ID NO: 38, CDR2: SEQ ID NO: 44, CDR3: SEQ ID NO: 40,
VL: CDR1: SEQ ID NO: 41, CDR2: SEQ ID NO: 45, CDR3: SEQ ID NO: 43;
and
 - (f) VH: CDR1: SEQ ID NO: 46, CDR2: SEQ ID NO: 47, CDR3: SEQ ID NO: 48,
VL: CDR1: SEQ ID NO: 49, CDR2: SEQ ID NO: 50, CDR3: SEQ ID NO: 51.
2. The anti-CLDN6 antibody of claim 1, wherein the antibody comprises:
 - (a) a heavy chain variable region having a sequence set forth in SEQ ID NO: ~~1~~23
and a light chain variable region having a sequence set forth in SEQ ID NO: 2;
 - (b) a heavy chain variable region having a sequence set forth in SEQ ID NO: 3 and a
light chain variable region having a sequence set forth in SEQ ID NO: 4
 - (c) a heavy chain variable region having a sequence set forth in SEQ ID NO: ~~23~~1
and a light chain variable region having a sequence set forth in SEQ ID NO: 2;
 - (d) a heavy chain variable region having a sequence set forth in SEQ ID NO: 24 and
a light chain variable region having a sequence set forth in SEQ ID NO: 25;
 - (e) a heavy chain variable region having a sequence set forth in SEQ ID NO: 26 and
a light chain variable region having a sequence set forth in SEQ ID NO: 27;
 - (f) a heavy chain variable region having a sequence set forth in SEQ ID NO: 28 and
a light chain variable region having a sequence set forth in SEQ ID NO: 29; or
 - (g) a heavy chain variable region having a sequence set forth in SEQ ID NO: 30 and
a light chain variable region having a sequence set forth in SEQ ID NO: 31.

3. The anti-CLDN6 antibody of claim 1, wherein the antibody is a human antibody.
4. The anti-CLDN6 antibody of claim 1, wherein the antibody is a chimeric antibody.
5. The anti-CLDN6 antibody according to anyone of claims 1 to 4, wherein the antibody is conjugated to a cytotoxic agent.
6. The anti-CLDN6 antibody of claim 1, wherein the antibody is a full-length antibody.
7. The anti-CLDN6 antibody of claim 1, wherein the antibody is an antibody fragment.
8. The anti-CLDN6 antibody of claim 7, wherein the antibody fragment is selected from the group consisting of: Fab, Fab, F(ab)2, Fd, Fv, scFv and scFv-Fc fragment, a single-chain antibody, a minibody, and a diabody.
9. A pharmaceutical composition comprising as an active ingredient, at least one antibody according to anyone of claims 1 to 4 and a pharmaceutically acceptable carrier.
10. A pharmaceutical composition comprising as an active ingredient, an antibody ~~according to anyone~~ of claim 5 and a pharmaceutically acceptable carrier.
11. The pharmaceutical composition according to any one of claim 9 or 10 for use in ~~treating cancer~~therapy.
12. Use of a pharmaceutical composition according to claim 9 or 10 in the manufacture of a medicament for ~~A method of treating cancer comprising administering to a subject in need thereof, a pharmaceutical composition according to claim 9 or 10.~~
13. A method of determining an expression pattern of CLDN6 in a biological sample, ~~diagnosing a cancer in a subject,~~ the method comprising contacting ~~a~~the biological sample with an antibody or antibody fragment according to any one of claims 1 to 2.
14. An isolated polynucleotide comprising a sequence encoding an anti-CLDN6 antibody according to claim 1.

15. An isolated polynucleotide according to claim 14 encoding a sequence as set forth in any one of SEQ ID NOS: 1 to 4.

16. A vector comprising a polynucleotide according to claim 15.

17. A host cell comprising a polynucleotide according to claim 15, and/or a vector according to claim 16.

18. A method for the production of an anti-CLDN6 antibody according to claim 1, the method comprising culturing the host cell of claim 17.