Claims

1. An antibody or antigen-binding fragment thereof with binding specificity for integrin alpha10, wherein the antibody or antigen-binding fragment comprises:
a light chain variable region comprising
   a) a CDR-L1 comprising or consisting of an amino acid sequence of SEQ ID NO: 1;
   b) a CDR-L2 comprising or consisting of an amino acid sequence selected from the group consisting of SEQ ID NO: 2, and SEQ ID NO: 4; and
   c) a CDR-L3 comprising or consisting of an amino acid sequence of SEQ ID NO: 5;

   and/or

   a heavy chain variable region comprising
   d) a CDR-H1 comprising or consisting of an amino acid sequence selected from the group consisting of SEQ ID NO: 7, SEQ ID NO: 6 and SEQ ID NO: 8;
   e) a CDR-H2 comprising or consisting of an amino acid sequence of SEQ ID NO: 9; and

   a CDR-H3 comprising or consisting of an amino acid sequence of SEQ ID NO: 10.

2. The antibody or antigen-binding fragment thereof according to claim 1, wherein the antibody or antigen-binding fragment thereof binds to the extracellular I-domain of integrin alpha10beta1.

3. The antibody or antigen-binding fragment according to any one of the preceding claims, wherein the antibody or antigen-binding fragment thereof comprises a light chain variable region comprising or consisting of
   a) the amino acid sequence of SEQ ID NO: 13,
   or an amino acid sequence having at least 85% sequence identity to SEQ ID NO: 13, for example at least 90%, 95%, 98% or 99% sequence identity; or
   b) an amino acid sequence selected from the group consisting of SEQ ID NO: 11, SEQ ID NO:12; SEQ ID NO: 13; SEQ ID NO: 14 and SEQ ID NO:15, or an amino acid sequence having at least 85% sequence identity to SEQ ID NO: 11, SEQ ID NO:12; SEQ ID NO: 13; SEQ ID NO:

14 and SEQ ID NO:15, for example at least 90%, 95%, 98% or 99% sequence identity to any one of SEQ ID NO: 11, SEQ ID NO:12; SEQ ID NO: 14 and SEQ ID NO:15.

4. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, wherein the antibody or antigen-binding fragment thereof comprises a heavy chain variable region comprising or consisting of
    a) the amino acid sequence of SEQ ID NO: 19; or an amino acid sequence having at least 85% sequence identity to SEQ ID NO: 19 for example at least 90%, 95%, 98% or 99% sequence identity; or
    b) an amino acid sequence selected from the group consisting of SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, and SEQ ID NO: 20; or an amino acid sequence having at least 85% sequence identity to SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, and SEQ ID NO: 20, for example at least 90%, 95%, 98% or 99% sequence identity to any one of SEQ ID NO: 16, SEQ ID NO: 17, SEQ ID NO: 18, and SEQ ID NO: 20.

5. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, wherein the antibody or antigen-binding fragment thereof comprises a light chain variable region comprising
    a) a CDR-L1 comprising or consisting of an amino acid sequence of SEQ ID NO: 1;
    b) a CDR-L2 comprising or consisting of an amino acid sequence selected from the group consisting of SEQ ID NO: 2, and
    c) a CDR-L3 comprising or consisting of an amino acid sequence of SEQ ID NO: 5;

    and

a heavy chain variable region comprising

a) a CDR-H1 comprising or consisting of an amino acid sequence selected from the group consisting of SEQ ID NO: 7,

b) a CDR-H2 comprising or consisting of an amino acid sequence of SEQ ID NO: 9; and

c) a CDR-H3 comprising or consisting of an amino acid sequence of SEQ ID NO: 10;

or an amino acid sequence having at least 70% sequence identity to SEQ ID NO: 1, SEQ ID NO: 2, SEQ ID NO: 5, SEQ ID NO: 7, or SEQ ID NO: 9, SEQ ID NO: 10, for example at least 80%, 85%, 90%, 95%, 98% or 99% sequence identity.

6. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, wherein the antibody or antigen-binding fragment thereof comprises a light chain variable region which comprises or consists of SEQ ID NO: 13 and a heavy chain variable region which comprises or consists of SEQ ID NO: 19.

7. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, wherein the antibody or antigen-binding fragment thereof comprises a light chain constant region, or part thereof, such as wherein the light chain constant region is of a kappa or lambda light chain, such as kappa light chain.

8. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, wherein the antibody or antigen-binding fragment thereof comprises a heavy chain constant region, or part thereof, such as wherein the heavy chain constant region is of a human immunoglobulin subclass selected from the group consisting of IgG1, IgG2, IgG3 and IgG4, such as immunoglobulin subclass IgG1.

9. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, comprising or consisting of an antigen-binding fragment selected from the group consisting of Fv fragments (*e.g.* single chain Fv and disulphide-bonded Fv), Fab-like fragments (*e.g.* Fab fragments, Fab' fragments

and F(ab)$_2$ fragments) and domain antibodies (*e.g.* single V_H variable domains or V_L variable domains), and wherein the antibody or antigen-binding fragment thereof comprises an Fc region and/ or an intact antibody.

10. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, wherein the antibody or antigen-binding fragment thereof is conjugated to an additional moiety.

11. The antibody or antigen-binding fragment thereof according to any one of the preceding claims, wherein the additional moiety comprises a cytotoxic moiety, such as a toxin, a chemotherapeutic agent and a radioactive agent, or combinations thereof.

12. The antibody or antigen-binding fragment thereof according to claim 11, wherein said toxin is selected from the group consisting of Doxorubicin, Doxorubicin derivatives, such as 3′-deamino-3″-4′-anhydro-[2″(S)-methoxy-3″(R)-hydroxy-4″-morpholinyl]doxorubicin, and Amanitin.

13. A polynucleotide, such as a cDNA molecule, encoding an antibody or antigen-binding fragment thereof according to any one of the preceding claims or a component polypeptide chain thereof.

14. A method for producing an antibody or antigen-binding fragment thereof according to any one of claims 1 to12, the method comprising culturing a host cell comprising the polynucleotide according to claim 13, under conditions which permit expression of the encoded antibody or antigen-binding fragment thereof.

15. Use of an antibody or antigen-binding fragment thereof according to any one of claims 1 to 120, and/or a polynucleotide according to claim 13, in the manufacture of a medicament.

16. Use of an antibody or antigen-binding fragment thereof according to any one of claims 1 to 0, and/or a polynucleotide according to claim 13, in the manufacture of a medicament for use in the prevention, treatment, alleviation, detection and/or diagnosis of a disease or disorder susceptible to treatment with an inhibitor of integrin alpha10, and/or

wherein the disease or disorder is associated with cells expressing integrin alpha10beta1.

17. The use according to claim 16, wherein the disease or disorder is a neoplastic disease or disorder, such as a solid tumor selected from the group consisting of prostate cancer, breast cancer, brain cancer, cancer of the CNS, lung cancer, melanomas, pancreatic cancer, skin cancer, lymphoma, sarcoma, or a metastasis of any one of said cancer forms.

18. Use of an antibody or antigen-binding fragment thereof according to any one of claims 1 to12, and/or a polynucleotide according to claim 13, in the manufacture of a medicament for use in inhibiting cell migration, cell proliferation, cell growth, cell survival and/or cell adhesion of cells expressing integrin alpha10beta1.

19. An *in vitro* method for the detection of cells expressing integrin alpha10beta1in a subject, the method comprising:
    (a) providing a sample of cells from a subject to be tested, such as biopsy tissue or blood sample;
    (b) optionally, extracting and/or purifying the cells present in the sample;
    (c) contacting an antibody or antigen-binding fragment thereof according to any one of claims 1 to 12 with cells present in the sample;
    (d) determining whether the antibody or antigen-binding fragment thereof binds to the cells

    wherein the binding of the antibody or antigen-binding fragment thereof to the cells is indicative of the presence of a disease or disorder associated with cells expression integrin alpha10 in the tissue of a subject.

20. A method for *in vivo* imaging the expression of the integrin alpha10beta1 in a mammal, the method comprising the steps of
    a) providing a mammal,
    b) providing an antibody or antigen-binding fragment thereof according to any one of claims 1 to 12,
    c) administering the antibody or antigen-binding fragment thereof according to any one of claims 1 to 12 to the mammal so as to allow the

antibody or a fragment thereof to bind to an extracellular domain of integrin alpha10beta1 of cells in said mammal,

d) optionally adding a second labelled antibody or a fragment thereof to the sample, wherein the second antibody or a fragment thereof binds to the antibody or a fragment thereof in c),

e) detecting the antibody or antigen-binding fragment thereof according to any one of claims 1 to 12 of said cells in c), or optionally detecting the second labelled antibody or a fragment thereof in d) bound to the antibody or a fragment thereof, and

f) creating an image of the detected antibody or a fragment thereof, thereby imaging the expression of integrin alpha10beta1 on cells in a mammal *in vivo*.