

CLAIMS

1. An antibody or antibody fragment that binds a human CD39 polypeptide and that is capable of inhibiting the ATPase activity of a soluble extracellular domain human CD39 polypeptide, in which the antibody or antibody fragment comprises a heavy chain variable
5 region (VH) comprising the amino acid sequence of SEQ ID NOs: 31 and a light chain variable region (VL) comprising the amino acid sequence of SEQ ID NOs: 36 or 37.
2. An antibody or antibody fragment according to Claim 1, in which the antibody or antibody fragment comprises a heavy chain comprising an amino acid sequence at least 95% identical to the amino acid sequence of SEQ ID NOs: 38 and a light chain comprising an
10 amino acid sequence at least 95% identical to an amino acid sequence selected from the group consisting of SEQ ID NOs: 39 or 40.
3. An antibody or antibody fragment according to Claim 1 or 2, in which the antibody or antibody fragment comprises heavy chain framework FR1, FR2 and FR3 amino acid sequences from the human IGHV1-3 gene; and light chain framework FR1, FR2 and FR3
15 amino acid sequences from the human IGKV4-1 gene.
4. An antibody or antibody fragment, in which the antibody or antibody fragment comprises a heavy chain comprising the amino acid sequence of SEQ ID NO: 38 and a light chain comprising the amino acid sequence of SEQ ID NO: 39.
5. An antibody or antibody fragment, in which the antibody or antibody fragment
20 comprises a heavy chain comprising the amino acid sequence of SEQ ID NO: 38 and a light chain comprising the amino acid sequence of SEQ ID NO: 40.
6. An antibody or antibody fragment according to any preceding claim, in which the antibody is capable of inhibiting the ATPase activity of sCD39 protein shed in cell culture supernatants from human CD39-expressing tumor cells.
- 25 7. An antibody or antibody fragment according to any preceding claim, in which the antibody inhibits the ATPase activity of the CD39 protein in the presence of exogenously added ATP, optionally in which exogenously added ATP is provided at a concentration of 20 μ M.

8. An antibody or antibody fragment according to any preceding claim, in which the antibody is capable of binding human CD39 protein at the surface of a cell and that is capable of inhibiting the ATPase activity of the CD39 protein at the surface of a cell.
9. An antibody or antibody fragment according to any preceding claim, in which the antibody is capable of causing an increase in expression of a cell surface marker of activation in a monocyte-derived dendritic cells, when such moDC are incubated *in vitro* with the antibody and ATP, in which exogenously added ATP is provided at 0.125 mM, 0.25 mM or 0.5mM.
10. An antibody or antibody fragment according to any preceding claim, in which the antibody is an antibody having a human Fc domain that is modified to reduce binding between the Fc domain and a human Fc γ receptor.
11. An antibody or antibody fragment according to any preceding claim, in which the antibody comprises an Fc domain, optionally in which the Fc domain comprises an amino acid modification compared to a wild-type Fc domain, that has reduced or abolished binding to one or more, or all of, the human Fc γ receptors CD16A, CD16B, CD32A, CD32B and/or CD64.
12. A pharmaceutical composition comprising an antibody according to any preceding claim, and a pharmaceutically acceptable carrier.
13. A nucleic acid encoding a heavy and/or light chain of an antibody or antibody fragment according to any of Claims 1 to 11.
14. A recombinant host cell producing the antibody or antibody fragment according to any of Claims 1 to 11.
15. An antibody or antibody fragment according to any of Claims 1 to 11 or a composition according to Claim 12, for use in the treatment of cancer.

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5 region (VH) comprising the amino acid sequence of SEQ ID NOs: 31 and a light chain variable region (VL) comprising the amino acid sequence of SEQ ID NOs: 36 or 37.
2. An antibody or antibody fragment according to Claim 1, in which the antibody or antibody fragment comprises a heavy chain comprising an amino acid sequence at least 95% identical to the amino acid sequence of SEQ ID NOs: 38 and a light chain comprising an
10 amino acid sequence at least 95% identical to an amino acid sequence selected from the group consisting of SEQ ID NOs: 39 or 40.
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15 amino acid sequences from the human IGKV4-1 gene.
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5. An antibody or antibody fragment, in which the antibody or antibody fragment
20 comprises a heavy chain comprising the amino acid sequence of SEQ ID NO: 38 and a light chain comprising the amino acid sequence of SEQ ID NO: 40.
6. An antibody or antibody fragment according to any preceding claim, in which the antibody is capable of inhibiting the ATPase activity of sCD39 protein shed in cell culture supernatants from human CD39-expressing tumor cells.
- 25 7. An antibody or antibody fragment according to any preceding claim, in which the antibody inhibits the ATPase activity of the CD39 protein in the presence of exogenously added ATP, optionally in which exogenously added ATP is provided at a concentration of 20 μ M.

8. An antibody or antibody fragment according to any preceding claim, in which the antibody is capable of binding human CD39 protein at the surface of a cell and that is capable of inhibiting the ATPase activity of the CD39 protein at the surface of a cell.
9. An antibody or antibody fragment according to any preceding claim, in which the antibody is capable of causing an increase in expression of a cell surface marker of activation in a monocyte-derived dendritic cells, when such moDC are incubated *in vitro* with the antibody and ATP, in which exogenously added ATP is provided at 0.125 mM, 0.25 mM or 0.5mM.
10. An antibody or antibody fragment according to any preceding claim, in which the antibody is an antibody having a human Fc domain that is modified to reduce binding between the Fc domain and a human Fc γ receptor.
11. An antibody or antibody fragment according to any preceding claim, in which the antibody comprises an Fc domain, optionally in which the Fc domain comprises an amino acid modification compared to a wild-type Fc domain, that has reduced or abolished binding to one or more, or all of, the human Fc γ receptors CD16A, CD16B, CD32A, CD32B and/or CD64.
12. A pharmaceutical composition comprising an antibody according to any preceding claim, and a pharmaceutically acceptable carrier.
13. A nucleic acid encoding a heavy and a light chain of an antibody according to any of Claims 1 to 11.
14. A recombinant host cell capable of producing an antibody or antibody fragment according to any of Claims 1 to 11.
15. An antibody or antibody fragment according to any of Claims 1 to 11 or a composition according to Claim 12, for use in the treatment of cancer.