

CLAIMS

1. An isolated antibody that binds to CD39, wherein the antibody comprises:
 - i. (a) HCDR1 comprising the amino acid sequence of SEQ ID NO: 27; (b) HCDR2 comprising the amino acid sequence of SEQ ID NO: 28; (c) HCDR3 comprising the amino acid sequence of SEQ ID NO: 29; (d) LCDR1 comprising the amino acid sequence of SEQ ID NO: 37; (e) LCDR2 comprising the amino acid sequence of SEQ ID NO: 38; and (f) LCDR3 comprising the amino acid sequence of SEQ ID NO: 39; or
 - ii. (a) HCDR1 comprising the amino acid sequence of SEQ ID NO: 30; (b) HCDR2 comprising the amino acid sequence of SEQ ID NO: 31; (c) HCDR3 comprising the amino acid sequence of SEQ ID NO: 32; (d) LCDR1 comprising the amino acid sequence of SEQ ID NO: 40; (e) LCDR2 comprising the amino acid sequence of SEQ ID NO: 41; and (f) LCDR3 comprising the amino acid sequence of SEQ ID NO: 42.
2. The antibody of claim 1, which comprises a heavy chain variable region (V_H) and a light chain variable region (V_L), wherein:

the V_H is at least 90% identical to the amino acid sequence of SEQ ID NO: 33 and
the V_L is at least 90% identical to the amino acid sequence of SEQ ID NO: 43.
3. The antibody of claim 1, which comprises a heavy chain and a light chain, wherein:

the heavy chain is at least 90% identical to the amino acid sequence of SEQ ID NO: 35, 47, 49, or 51 and the light chain is at least 90% identical to the amino acid sequence of SEQ ID NO: 45.
4. The antibody of claim 1, which comprises a heavy chain and a light chain, wherein:

the heavy chain comprises the amino acid sequence of SEQ ID NO: 35, 47, 49, or 51 and the light chain comprises the amino acid sequence of SEQ ID NO: 45.
5. The antibody of claim 1, wherein
 - a. the antibody increases proliferation of a lymphocyte, optionally wherein the lymphocyte is a tumor-infiltrating lymphocyte, or CD4⁺ T cell; and/or
 - b. the antibody enhances expression of one or more dendritic cell activation markers; and/or
 - c. wherein the antibody enhances secretion of one or more cytokines from dendritic cells and/or
 - d. wherein the antibody cross-reacts with cynomolgus CD39.

6. The antibody of claim 1, wherein the antibody is a monoclonal antibody.
7. The antibody of claim 1, wherein the antibody is an antibody fragment selected from a Fab, Fab', Fv, scFv or (Fab')₂ fragment.
8. The antibody of claim 1, wherein the antibody is a full length antibody.
9. A pharmaceutical composition comprising the anti-CD39 antibody of claim 1 and a pharmaceutically acceptable carrier.
10. A kit comprising the anti-CD39 antibody of claim 1.
11. An isolated antibody that binds to CD39, which comprises a heavy chain variable region (V_H) and a light chain variable region (V_L), wherein:
the V_H comprises the amino acid sequence of SEQ ID NO: 33 and the V_L comprises the amino acid sequence of SEQ ID NO: 43.
12. The antibody of claim 11, which comprises a heavy chain and a light chain, wherein:
the heavy chain is at least 90% identical to the amino acid sequence of SEQ ID NO: 35, 47, 49, or 51 and the light chain is at least 90% identical to the amino acid sequence of SEQ ID NO: 45.
13. The antibody of claim 11, which comprises a heavy chain and a light chain, wherein: the heavy chain comprises the amino acid sequence of SEQ ID NO: 35, 47, 49, or 51 and the light chain comprises the amino acid sequence of SEQ ID NO: 45.
14. The antibody of claim 11, wherein
 - a. the antibody increases proliferation of a lymphocyte, optionally wherein the lymphocyte is a tumor-infiltrating lymphocyte, or CD4⁺ T cell; and/or
 - b. the antibody enhances expression of one or more dendritic cell activation markers; and/or
 - c. wherein the antibody enhances secretion of one or more cytokines from dendritic cells and/or
 - d. wherein the antibody cross-reacts with cynomolgus CD39.
15. The antibody of claim 11, wherein the antibody is a monoclonal antibody.
16. The antibody of claim 11, wherein the antibody is an antibody fragment selected from a Fab, Fab', Fv, scFv or (Fab')₂ fragment.
17. The antibody of claim 11, wherein the antibody is a full length antibody.
18. A pharmaceutical composition comprising the anti-CD39 antibody of claim 11 and a pharmaceutically acceptable carrier.
19. A kit comprising the anti-CD39 antibody of claim 11.