CLAIMS

1. A method of producing an antibody that binds CLD18A2, or an antigen binding fragment thereof, that binds to CLD18A2 but not to CLD18A1, and mediates killing of cells expressing CLD18A2, the method comprising the steps of:

(a) culturing a host cell transformed with one or more expression vectors encoding the antibody or antigen binding fragment thereof under conditions in which the host cell expresses the antibody or antigen binding fragment thereof; and

(b) harvesting a preparation of the antibody or antigen binding fragment thereof expressed by the cell;

wherein the one or more expression vectors comprise:

(i) a nucleic acid sequence encoding heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 45-52, positions 70-77, and positions 116-125 of SEQ ID NO: 115, respectively; and a nucleic acid sequence encoding light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 49-53, positions 71-73, and positions 110-118 of SEQ ID NO: 122, respectively;

(ii) a nucleic acid sequence encoding heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 45-52, positions 70-77, and positions 116-126 of SEQ ID NO: 116, respectively; and a nucleic acid sequence encoding light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 47-58, positions 76-78, and positions 115-123 of SEQ ID NO: 121, respectively;

(iii) a nucleic acid sequence encoding heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 45-52, positions 70-77, and positions 116-124 of SEQ ID NO: 117, respectively; and a nucleic acid sequence encoding light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 47-52, positions 70-72, and positions 109-117 of SEQ ID NO: 123, respectively;

(iv) a nucleic acid sequence encoding heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 44-51, positions 69-76, and positions 115-125 of SEQ ID NO: 119, respectively; and a nucleic acid sequence encoding light chain CDR1, CDR2, and CDR3

regions having the amino acid sequences of positions 47-58, positions 76-78, and positions 115-122 of SEQ ID NO: 126, respectively; or

(v) a nucleic acid sequence encoding heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 45-52, positions 70-77, and positions 116-126 of SEQ ID NO: 118, respectively; and a nucleic acid sequence encoding light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 47-58, positions 76-78, and positions 115-123 of SEQ ID NO: 125, respectively.

2. The method of claim 1, wherein the host cell is selected from the group consisting of a CHO cell, NS/0 cell, HEK293 cell, HEK293T cell, plant cell, fungal cell, dendritic cell, B cell, COS cell, K562 cell, HELA cell, yeast cell, and insect cell.

3. The method of claim 1 or 2, wherein the host cell is a CHO cell.

4. The method of any one of claims 1 to 3, wherein the expression vector comprises a promoter sequence, a leader sequence, a translation initiation sequence, a light chain constant region, a heavy chain constant region, 3' untranslated sequence, a polyadenylation sequence, or a transcription termination sequence.

5. A recombinant nucleic acid comprising a nucleic acid sequence selected from the group consisting of:

(i) a nucleic acid sequence encoding a heavy chain of an antibody comprising heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 45-52, positions 70-77, and positions 116-125 of SEQ ID NO: 115, respectively;

(ii) a nucleic acid sequence encoding a heavy chain of an antibody comprising heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 45-52, positions 70-77, and positions 116-126 of SEQ ID NO: 116, respectively;

(iii) a nucleic acid sequence encoding a heavy chain of an antibody comprising heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 45-52, positions 70-77, and positions 116-124 of SEQ ID NO: 117, respectively;

(iv) a nucleic acid sequence encoding a heavy chain of an antibody comprising heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 44-51, positions 69-76, and positions 115-125 of SEQ ID NO: 119, respectively; and

(v) a nucleic acid sequence encoding a heavy chain of an antibody comprising heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 45-52, positions 70-77, and positions 116-126 of SEQ ID NO: 118, respectively.

6. The recombinant nucleic acid of claim 5, wherein the nucleic acid sequence encodes a heavy chain variable region comprising an amino acid sequence selected from the group consisting of SEQ ID NO: 132, 133, 134, 135, 137 and 136.

7. The recombinant nucleic acid of claim 5 or 6, wherein the recombinant nucleic acid comprises a human or murine heavy chain constant region.

8. The recombinant nucleic acid of any one of claims 5 to 7, wherein the nucleic acid sequence is selected from the group consisting of SEQ ID NOs: 100, 101, 102, 104, 103, and 105 or encodes a heavy chain comprising an amino acid sequence selected from the group consisting of SEQ ID NOs: 115, 116, 117, 119, 118 and 120.

9. A recombinant nucleic acid comprising a nucleic acid sequence selected from the group consisting of:

(i) a nucleic acid sequence encoding a light chain of an antibody comprising light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 49-53, positions 71-73, and positions 110-118 of SEQ ID NO: 122, respectively;

(ii) a nucleic acid sequence encoding a light chain of an antibody comprising light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 47-58, positions 76-78, and positions 115-123 of SEQ ID NO: 121, respectively;

(iii) a nucleic acid sequence encoding a light chain of an antibody comprising light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 47-52, positions 70-72, and positions 109-117 of SEQ ID NO: 123, respectively;

(iv) a nucleic acid sequence encoding a light chain of an antibody comprising light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 47-58, positions 76-78, and positions 115-122 of SEQ ID NO: 126, respectively; and

(v) a nucleic acid sequence encoding a light chain of an antibody comprising light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 47-58, positions 76-78, and positions 115-123 of SEQ ID NO: 125, respectively.

10. The recombinant nucleic acid of claim 9, wherein the nucleic acid sequence encodes a light chain variable region comprising an amino acid sequence selected from the group consisting of SEQ ID NO: 139, 138, 140, 143, 142, 141, 144, 145 and 146.

11. The recombinant nucleic acid of claim 9 or 10, wherein the recombinant nucleic acid comprises a human or murine light chain constant region.

12. The recombinant nucleic acid of any one of claims 9 to 11, wherein the nucleic acid sequence is selected from the group consisting of SEQ ID NOs: 107, 106, 108, 111, 110, 109, 112, 113, and 114 or encodes a light chain comprising an amino acid sequence selected from the group consisting of SEQ ID NOs: 122, 121, 123, 126, 125, 124, 127, 128 and 129.

13. The recombinant nucleic acid of any one of claims 5 to 12, wherein the nucleic acid sequence is operatively linked to expression control sequences.

14. A transformed cell comprising the recombinant nucleic acid of any one of claims 5 to 13.

15. The transformed cell of claim 14, wherein the cell is selected from the group consisting of a CHO cell, NS/0 cell, HEK293 cell, HEK293T cell, plant cell, fungal cell, dendritic cell, B cell, COS cell, K562 cell, HELA cell, yeast cell, and insect cell.

16. A method of producing an antibody producing cell, comprising the steps of

(a) transforming a cell with an expression vector comprising the nucleic acid of any one of claims 5 to 13; and

(b) obtaining the transformed cell, wherein the transformed cell comprises the nucleic acid sequence encoding a heavy chain of an antibody and/or the nucleic acid sequence encoding the light chain of the antibody.