Claims

1. A method of producing an antibody, or an antigen binding fragment thereof, that binds to CLDN6, the method comprising the steps of:

(a) culturing a human host cell transformed with one or more expression vectors 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 human host cell;

wherein the one or more expression vectors comprise:

(i) a nucleic acid sequence encoding a polypeptide comprising the antibody heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 26-33, positions 51-58, and positions 97-106 of SEQ ID NO: 36, respectively, or a variant thereof; and

(ii) a nucleic acid sequence encoding a polypeptide comprising the antibody light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 27-31, positions 49-51, and positions 88-97 of SEQ ID NO: 35, respectively, or a variant thereof;

wherein the variant comprises heavy chain CDR1, CDR2, and CDR3 regions having amino acid sequences according to SEQ ID NOs: 47, 48, and 46, respectively, and light chain CDR1, CDR2, and CDR3 regions having amino acid sequences according to SEQ ID NOs: 52, 53, and 51, respectively.

2. The method of claim 1 wherein the human host cell is a HEK293 cell, HEK293T cell, dendritic cell, B cell, K562 cell, HELA cell, or a lymphocytic cell.

3. The method of claim 1 or 2, wherein the human host cell is a B 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. The method of any one of claims 1 to 4, wherein the antigen binding fragment is a Fab, $F(ab')_2$, Fv, or single chain Fv.

6. A recombinant nucleic acid comprising: a nucleic acid sequence encoding a polypeptide comprising the antibody heavy chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 26-33, positions 51-58, and positions 97-106 of SEQ ID NO: 36, respectively, or a variant thereof; and a nucleic acid sequence encoding a polypeptide comprising the antibody light chain CDR1, CDR2, and CDR3 regions having the amino acid sequences of positions 27-31, positions 49-51, and positions 88-97 of SEQ ID NO: 35, respectively, or a variant thereof, wherein the variant comprises heavy chain CDR1, CDR2, and CDR3 regions having amino acid sequences according to SEQ ID NOs: 47, 48, and 46, respectively, and light chain CDR1, CDR2, and CDR3 regions having amino acid sequences according to SEQ ID NOs: 52, 53, and 51, respectively,

wherein said antibody binds to CLDN6.

7. The recombinant nucleic acid of claim 6, wherein the nucleic acid sequence encodes a polypeptide comprising a heavy chain variable region having the amino acid sequence of SEQ ID NO: 36 and a light chain variable region having the amino acid sequence of SEQ ID NO: 35.

8. The recombinant nucleic acid of claim 6 or 7, wherein the nucleic acid sequence is operatively linked to expression control sequences.

9. A eukaryotic host cell comprising the recombinant nucleic acid of any one of claims 6 to 8.

10. The cell of claim 9, wherein the eukaryotic host cell is a transformed human cell, preferably a HEK293 cell, HEK293T cell, dendritic cell, B cell, K562 cell, HELA cell, or a lymphocytic cell.

11. A polypeptide encoded by the recombinant nucleic acid of any one of claims 6 to 8.

12. The polypeptide of claim 11, further comprising an immunoglobulin hinge region.

13. An anti-CLDN6 antibody expressed by the eukaryotic host cell of claim 9 or 10.

14. An antigen binding fragment expressed by the eukaryotic host cell of claim 9 or 10, wherein the antigen binding fragment binds to CLDN6.

15. The antigen binding fragment of claim 14, wherein the antigen binding fragment is a Fab, $F(ab')_2$, Fv, or single chain Fv.

16. The antigen binding fragment of claim 14 or 15, wherein the antigen binding fragment is fused to an immunoglobulin hinge region.

17. A method of producing a recombinant eukaryotic host cell, comprising the steps of:

a. transforming a eukaryotic cell with an expression vector comprising the recombinant nucleic acid of any one of claims 6 to 8; and

b. obtaining the transformed cell, wherein the transformed cell comprises the recombinant nucleic acid.

18. The method of claim 17, wherein the recombinant eukaryotic host cell is a human cell.

19. The method of claim 18, wherein the human cell is a HEK293 cell, HEK293T cell, dendritic cell, B cell, K562 cell, HELA cell, or a lymphocytic cell.