[0014] If the antigen binding protein comprises the VH3|3-33 germline subfamily, the method comprises modifying the VH3 sequence to comprise one or more substitutions selected from $1X^4$, $17X^5$, and $85X^6$, wherein X^4 is a charged negative residue (D or E), X^5 is a small hydrophobic residue (G, A, V, I, L, or M), and X^6 is a small hydrophobic residue (G.A, V, I, L, or M). All residues are identified by the Aho numbering system. Preferred mutations for the VH3|3-33 germline subfamily are 1E, 17G, and 85A.

[0014a] In one aspect, the disclosure relates to a method of reducing the viscosity of an antibody of the VH3|3-33 germline subfamily, which comprises:

modifying the VH3 sequence to comprise the amino acid substitutions $1X^4$, $17X^5$, and $85X^6$, wherein X^4 is selected from D and E, X^5 is selected from G, A, V, I, L, M, and W, and X^6 is selected from G, A, V, I, L, and M;

and wherein the amino acids are numbered according to the Aho numbering system.

Claims

What is claimed is:

1. A method of reducing the viscosity of an antibody of the VH3|3-33 germline subfamily, which comprises modifying the VH3 sequence to comprise the amino acid substitutions $1X^4$, $17X^5$, and $85X^6$, wherein X^4 is selected from D and E, X^5 is selected from G, A,V, I, L, M, and W, and X^6 is selected from G, A, V, I, L, and M; and wherein the amino acids are numbered according to the Aho numbering system.

2. The method of claim 1, which comprises modifying the VH3 sequence to comprise the amino acid substitutions 1E, 17G, and 85A.

3. The method of claim 1 or claim 2, wherein the antibody comprises a heavy chain amino acid sequence comprising SEQ ID NO: 160, except for substitutions 1E, 17G, and 85A, and a light chain amino acid sequence comprising SEQ ID NO: 158.

4. The method of claim 1 or claim 2, wherein the antibody comprises a heavy chain amino acid sequence comprising SEQ ID NO: 144, except for substitutions 1E, 17G, and 85A, and a light chain amino acid sequence comprising SEQ ID NO: 142.

5. The method of claim 1 or claim 2, wherein the antibody comprises a heavy chain amino acid sequence comprising SEQ ID NO: 128, except for substitutions 1E, 17G, and 85A, and a light chain amino acid sequence comprising SEQ ID NO: 126.

6. The method of claim 1 or claim 2, wherein the antibody comprises a heavy chain amino acid sequence comprising SEQ ID NO: 120, except for substitutions 1E, 17G, and 85A, and a light chain amino acid sequence comprising SEQ ID NO: 118.