Claims

1. An antibody or fragment thereof comprising a VL and a VH, wherein the VL is a VL in a light chain selected from the group consisting of SEQ ID NO: 4, SEQ ID NO: 5, SEQ ID NO: 6, SEQ ID NO: 7, SEQ ID NO: 8, SEQ ID NO: 9, SEQ ID NO: 10, and SEQ ID NO: 14 and the VH is a VH in a heavy chain selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 15, and SEQ ID NO: 16.

2. The antibody of claim 1, which comprises a constant region.

3. The antibody of claim 2, wherein the constant region is IgG1, IgG2, or IgG4.

4. The antibody of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 5 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 2.

5. The antibody of claim 4, which comprises a constant region of IgG4.

6. The antibody of claim 4, which comprises a light chain and a heavy chain, wherein the light chain comprises the light chain as set forth in SEQ ID NO: 5 and the heavy chain comprises the heavy chain as set forth in SEQ ID NO: 2.

7. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 4 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 2.

8. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 6 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 2.

9. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 7 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 2.

10. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 8 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 2.

11. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 9 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 2.

12. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 10 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 2.

13. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 14 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 2.

14. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 5 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 15.

15. The antibody or fragment thereof of claim 1, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 14 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 16.

16. An antibody or fragment thereof comprising a VL and a VH, wherein the VL is a VL in the light chain as set forth in SEQ ID NO: 3 and the VH is a VH in a heavy chain selected from the group consisting of SEQ ID NO: 11, SEQ ID NO: 12, SEQ ID NO: 13, SEQ ID NO: 15, and SEQ ID NO: 16.

17. The antibody of claim 16, which comprises a constant region.

18. The antibody of claim 17, wherein the constant region is IgG1, IgG2, or IgG4.

19. The antibody or fragment thereof of claim 16, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 3 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 11.

20. The antibody or fragment thereof of claim 16, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 3 and a VH is the VH of the heavy chain as set forth in SEQ ID NO: 12.

21. The antibody or fragment thereof of claim 16, wherein the VL is a VL of the light chain as set forth in SEQ ID NO: 3 and the VH is a VH of the heavy chain as set forth in SEQ ID NO: 13.