

CLAIMS

Listing of Claims

1. An antibody or antigen binding fragment thereof that binds CD30L, wherein the antibody or antigen binding fragment thereof comprises:
 - (a) a CDR-H1 comprising the amino acid sequence set forth in any one of SEQ ID NOs: - 712-723;
 - (b) a CDR-H2 comprising the amino acid sequence set forth in any one of SEQ ID NOs: - 724-735;
 - (c) a CDR-H3 comprising the amino acid sequence set forth in any one of SEQ Id NOs: - 736-743;
 - (d) a CDR-L1 comprising the amino acid sequence set forth in any one of SEQ ID NOs: - 744-751;
 - (e) CDR-L2 comprising the amino acid sequence set forth in any one of SEQ ID NOs: - 752-759; and/or
 - (f) a CDR-L3 comprising the amino acid sequence set forth in any one of SEQ ID NOs: - 760-765.
2. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises:
 - (a) a CDR-H1 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 100-139, 220-234, 465-489, and 628-641;
 - (b) a CDR-H2 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 140-179, 235-249, 490-499, 513-527, and 642-655;
 - (c) a CDR-H3 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 180-219, 250-264, 528-552, and 656-669;
 - (d) a CDR-L1 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 300-339, 420-434, 553-577, and 670-683;
 - (e) a CDR-L2 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 340-379, 435-449, 578-602, and 684-697; and/or
 - (f) a CDR-L3 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 380-419, 450-464, 603-627, and 698-711.

3. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises:

(a) a CDR-H1 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 720 and 721;

(b) a CDR-H2 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 732 and 733;

(c) a CDR-H3 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 740 and 741;

(d) a CDR-L1 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 748 and 749;

(e) a CDR-L2 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 756 and 757; and/or

(f) a CDR-L3 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 760 and 761.

4. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises:

(a) a CDR-H1 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 115-119, and 629;

(b) a CDR-H2 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 155-159, and 643;

(c) a CDR-H3 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 195, 198-199, and 657;

(d) a CDR-L1 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 315, 318-319, and 671;

(e) a CDR-L2 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 355, 358-359, and 685; and/or

(f) a CDR-L3 comprising the amino acid sequence set forth in any one of SEQ ID NOs: 395, 398, and 699.

5. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises:

(a) a CDR-H1 comprising the amino acid sequence set forth in SEQ ID NO: 117; (b) a CDR-H2

comprising the amino acid sequence set forth in SEQ ID NO: 157; (c) a CDR-H3 comprising the amino acid sequence set forth in SEQ ID NO: 197; (d) a CDR-L1 comprising the amino acid sequence set forth in SEQ ID NO: 317; (e) a CDR-L2 comprising the amino acid sequence set forth SEQ ID NO: 357; and/or (f) a CDR-L3 comprising the amino acid sequence set forth SEQ ID NO: 397.

6. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises: (a) a CDR-H1 comprising the amino acid sequence set forth in SEQ ID NO: 115; (b) a CDR-H2 comprising the amino acid sequence set forth in SEQ ID NO: 155; (c) a CDR-H3 comprising the amino acid sequence set forth in SEQ ID NO: 195; (d) a CDR-L1 comprising the amino acid sequence set forth in SEQ ID NO: 315; (e) a CDR-L2 comprising the amino acid sequence set forth SEQ ID NO: 355; and/or (f) a CDR-L3 comprising the amino acid sequence set forth SEQ ID NO: 395.

7. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises: (a) a CDR-H1 comprising the amino acid sequence set forth in SEQ ID NO: 116; (b) a CDR-H2 comprising the amino acid sequence set forth in SEQ ID NO: 156; (c) a CDR-H3 comprising the amino acid sequence set forth in SEQ ID NO: 196; (d) a CDR-L1 comprising the amino acid sequence set forth in SEQ ID NO: 316; (e) a CDR-L2 comprising the amino acid sequence set forth SEQ ID NO: 356; and/or (f) a CDR-L3 comprising the amino acid sequence set forth SEQ ID NO: 396.

8. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises: (a) a CDR-H1 comprising the amino acid sequence set forth in SEQ ID NO: 118; (b) a CDR-H2 comprising the amino acid sequence set forth in SEQ ID NO: 158; (c) a CDR-H3 comprising the amino acid sequence set forth in SEQ ID NO: 198; (d) a CDR-L1 comprising the amino acid sequence set forth in SEQ ID NO: 318; (e) a CDR-L2 comprising the amino acid sequence set forth SEQ ID NO: 358; and/or (f) a CDR-L3 comprising the amino acid sequence set forth SEQ ID NO: 398.

9. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises: (a) a CDR-H1 comprising the amino acid sequence set forth in SEQ ID NO: 119; (b) a CDR-H2 comprising the amino acid sequence set forth in SEQ ID NO: 159; (c) a CDR-H3 comprising the amino acid sequence set forth in SEQ ID NO: 199; (d) a CDR-L1 comprising the amino acid sequence set forth in SEQ ID NO:

319; (e) a CDR-L2 comprising the amino acid sequence set forth SEQ ID NO: 359; and/or (f) a CDR-L3 comprising the amino acid sequence set forth SEQ ID NO: 399.

10. The antibody or antigen binding fragment thereof of claim 1, wherein the antibody or antigen binding fragment thereof comprises: (a) a CDR-H1 comprising the amino acid sequence set forth in SEQ ID NO: 629; (b) a CDR-H2 comprising the amino acid sequence set forth in SEQ ID NO: 643; (c) a CDR-H3 comprising the amino acid sequence set forth in SEQ ID NO: 657; (d) a CDR-L1 comprising the amino acid sequence set forth in SEQ ID NO: 671; (e) a CDR-L2 comprising the amino acid sequence set forth SEQ ID NO: 685; and/or (f) a CDR-L3 comprising the amino acid sequence set forth SEQ ID NO: 699.

11. The antibody or antigen binding fragment thereof of any one of claims 1 to 2, wherein the antibody or antigen binding fragment thereof comprises:

(i) (a) an immunoglobulin variable region heavy chain (VH) comprising an amino acid sequence having at least about 90, 95, 97, 98, 99, or 100 % sequence identity to any one of SEQ ID NOs: 1, 2, 5, and 6; and/or (b) an immunoglobulin variable region light chain (VL) comprising an amino acid sequence having at least about 90, 95, 97, 98, 99, or 100 % sequence identity to any one of SEQ ID NOs: 3, 4, 7, and 8; or

(ii) (a) a VH comprising an amino acid sequence having at least about 90, 95, 97, 98, 99, or 100 % sequence identity to SEQ ID NO: 6; and/or (b) a VL comprising an amino acid sequence having at least about 90, 95, 97, 98, 99, or 100 % sequence identity to SEQ ID NO: 8.

12. The antibody or antigen binding fragment thereof of any one of claims 1 to 2, wherein the antibody or antigen binding fragment thereof comprises:

(i) (a) a VH comprising an amino acid sequence set forth in any one of SEQ ID NOs: 1, 2, 5, 6, 9, 10, 13, 14, 17, 19, 21, 23, 25, 27, 29, and 31; and/or (b) a VL comprising an amino acid sequence set forth in any one of SEQ ID NOs: 3, 4, 7, 8, 11, 12, 15, 16, 18, 20, 22, 24, 26, 28, and 30;

(ii) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 1; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 3;

(iii) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 2; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 4;

(iv) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 5; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 7;

- (v) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 6; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 8;
- (vi) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 9; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 11;
- (vii) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 10; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 12;
- (viii) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 13; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 15;
- (ix) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 14; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 16;
- (x) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 23; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 24;
- (xi) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 25; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 26;
- (xii) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 27; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 28;
- (xiii) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 29; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 30; or
- (xiv) (a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 31; and/or (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 32.

13. The antibody or antigen binding fragment thereof of any one of claims 1 to 2, comprising a VH and a VL, wherein:

(a) the VH comprises an amino acid sequence having at least about 90% sequence identity to SEQ ID NO: 6; and

(b) the VL comprises an amino acid sequence having at least about 90% sequence identity to SEQ ID NO: 8.

14. The antibody or antigen binding fragment thereof of any one of claims 1 to 2, wherein the antibody or antigen binding fragment thereof comprises:

(a) a VH comprising an amino acid sequence set forth in SEQ ID NO: 6; and (b) a VL comprising an amino acid sequence set forth in SEQ ID NO: 8.

15. The antibody or antigen binding fragment thereof of any one of claims 1 to 14, further comprising an IgG constant region, wherein optionally the IgG constant region having reduced antibody-dependent cell-mediated cytotoxicity (ADCC) function as compared to human IgG and/or reduced complement-dependent cytotoxicity (CDC) as compared to human IgG.

16. The antibody or antigen binding fragment thereof of claim 15, wherein:

(i) the constant region comprises an amino acid sequence having 80, 85, 90, 95, 97, 98, 99, or 100 % sequence identity to the amino acid sequence set forth by any one of SEQ ID NOs: 500-512; or

(ii) the constant region comprises the amino acid sequence set forth by any one of SEQ ID NOs: 500-512.

17. The antibody or antigen binding fragment thereof of any one of claims 1 to 16, wherein:

(i) the antibody or antigen binding fragment thereof is an IgG antibody, wherein optionally the IgG antibody is IgG1, IgG2, IgG3, or IgG4;

(ii) the antibody or antigen binding fragment thereof is human, chimeric, or humanized; or

(iii) wherein the antibody or antigen binding fragment thereof is a Fab, F(ab')₂, a single-domain antibody, or a single chain variable fragment (scFv).

18. A nucleic acid encoding the antibody or antigen binding fragment thereof of any one of claims 1 to 17.

19. A cell comprising the antibody or antigen binding fragment thereof of any one of claims 1 to 17 or the nucleic acid of claim 18.

20. The cell of claim 19, wherein the cell is a eukaryotic cell or a prokaryotic cell.

21. Use of the antibody or antigen binding fragment thereof of any one of claims 1 to 17 in the manufacture of a medicament for treating an autoimmune disease in an individual in need thereof.

22. The use of claim 21, wherein the autoimmune disease is irritable bowel disease, wherein optionally the irritable bowel disease is ulcerative colitis (UC) or Crohn's Disease (CD).

23. The antibody or antigen binding fragment thereof of any one of claims 1 to 17 for use in therapy.