

CLAIMS

1. An antibody molecule capable of binding to complement component 5a receptor 1 (C5aR1), wherein the antibody molecule competes with a C5aR1 antibody molecule comprising:
 - an HCDR1 comprising an amino acid sequence of SEQ ID NO: 656, an HCDR2 comprising an amino acid sequence of SEQ ID NO: 776, and an HCDR3 comprising an amino acid sequence of SEQ ID NO: 896, an LCDR1 comprising an amino acid sequence of SEQ ID NO: 715, an LCDR2 comprising an amino acid sequence of SEQ ID NO: 835, and an LCDR3 comprising an amino acid sequence of SEQ ID NO: 955.
2. The antibody molecule capable of claim 1, wherein the antibody molecule binds to an epitope on Site I of C5aR1, wherein the epitope on Site I comprises amino acid residues of SEQ ID NO: 1449 or SEQ ID NO: 1452.
3. The antibody molecule of claim 1, comprising a VH and/or a VL,
 - wherein the VH comprises:
 - i. an HCDR1 comprising an amino acid sequence of SEQ ID NO: 656;
 - ii. an HCDR2 comprising an amino acid sequence of SEQ ID NO: 776; and
 - iii. an HCDR3 comprising an amino acid sequence of SEQ ID NO: 896; and
 - wherein the VL comprises:
 - i. an LCDR1 comprising an amino acid sequence of SEQ ID NO: 715,
 - ii. an LCDR2 comprising an amino acid sequence of SEQ ID NO: 835, and
 - iii. an LCDR3 comprising an amino acid sequence of SEQ ID NO: 955.
4. The antibody molecule of claim 1, comprising a VH and/or a VL,
 - wherein the VH comprises:
 - i. an HCDR1 comprising an amino acid sequence of SEQ ID NO: 603;
 - ii. an HCDR2 comprising an amino acid sequence of SEQ ID NO: 723; and
 - iii. an HCDR3 comprising an amino acid sequence of SEQ ID NO: 843; and
 - wherein the VL comprises:
 - i. an LCDR1 comprising an amino acid sequence of SEQ ID NO: 663,
 - ii. an LCDR2 comprising an amino acid sequence of SEQ ID NO: 783, and
 - iii. an LCDR3 comprising an amino acid sequence of SEQ ID NO: 903.

5. The antibody molecule of claim 1, comprising a VH and/or a VL,
wherein the VH comprises:
- an HCDR1 comprising an amino acid sequence of SEQ ID NO: 611;
 - an HCDR2 comprising an amino acid sequence of SEQ ID NO: 731; and
 - an HCDR3 comprising an amino acid sequence of SEQ ID NO: 851; and
- wherein the VL comprises:
- an LCDR1 comprising an amino acid sequence of SEQ ID NO: 671,
 - an LCDR2 comprising an amino acid sequence of SEQ ID NO: 792, and
 - an LCDR3 comprising an amino acid sequence of SEQ ID NO: 911.
6. An antibody molecule capable of binding to complement component 5a receptor 1 (C5aR1),
wherein the antibody molecule competes with a C5aR1 antibody molecule comprising:
an HCDR1 comprising an amino acid sequence of SEQ ID NO: 612, an HCDR2
comprising an amino acid sequence of SEQ ID NO: 732, and an HCDR3 comprising an
amino acid sequence of SEQ ID NO: 852, an LCDR1 comprising an amino acid sequence of
SEQ ID NO: 672, an LCDR2 comprising an amino acid sequence of SEQ ID NO: 792, and an
LCDR3 comprising an amino acid sequence of SEQ ID NO: 912.
7. The antibody molecule of claim 6, wherein the antibody molecule binds to an epitope on Site
II of C5aR1, wherein the epitope on Site II comprises amino residues of SEQ ID NO: 1450.
8. The antibody molecule of claim 6, comprising a VH and/or a VL,
wherein the VH comprises:
- an HCDR1 comprising an amino acid sequence of SEQ ID NO: 612;
 - an HCDR2 comprising an amino acid sequence of SEQ ID NO: 732; and
 - an HCDR3 comprising an amino acid sequence of SEQ ID NO: 852; and
- wherein the VL comprises:
- an LCDR1 comprising an amino acid sequence of SEQ ID NO: 672,
 - an LCDR2 comprising an amino acid sequence of SEQ ID NO: 792, and
 - an LCDR3 comprising an amino acid sequence of SEQ ID NO: 912.
9. The antibody molecule of claim 6, comprising a VH and/or a VL,
wherein the VH comprises:
- an HCDR1 comprising an amino acid sequence of SEQ ID NO: 602;
 - an HCDR2 comprising an amino acid sequence of SEQ ID NO: 722; and
 - an HCDR3 comprising an amino acid sequence of SEQ ID NO: 842; and
- wherein the VL comprises:

- i. an LCDR1 comprising an amino acid sequence of SEQ ID NO: 662,
- ii. an LCDR2 comprising an amino acid sequence of SEQ ID NO: 782, and
- iii. an LCDR3 comprising an amino acid sequence of SEQ ID NO: 902.

10. The antibody molecule of claim 6, comprising a VH and/or a VL,

wherein the VH comprises:

- i. an HCDR1 comprising an amino acid sequence of SEQ ID NO 617;
- ii. an HCDR2 comprising an amino acid sequence of SEQ ID NOs: 737; and
- iii. an HCDR3 comprising an amino acid sequence of SEQ ID NO: 857; and

wherein the VL comprises:

- i. an LCDR1 comprising an amino acid sequence of SEQ ID NO: 677,
- ii. an LCDR2 comprising an amino acid sequence of SEQ ID NO: 797, and
- iii. an LCDR3 comprising an amino acid sequence of SEQ ID NO: 917.

11. A multispecific antibody molecule capable of binding to complement component 5a receptor 1 (C5aR1), wherein the antibody molecule comprises:

a first immunoglobulin variable region that binds to a first epitope, and a second immunoglobulin variable region that binds to a second epitope,

wherein the first epitope is on Site II of C5aR1, comprising amino acid residues of SEQ ID NO: 1450; and

wherein the second epitope is on Site I of C5aR1 comprising amino acid residues of SEQ ID NO: 1449 or SEQ ID NO: 1452.

12. The multispecific antibody molecule of claim 11,

wherein the first immunoglobulin variable region competes with a C5aR1 antibody molecule comprising:

a HCDR1 comprising an amino acid sequence of SEQ ID NO: 612, a HCDR2 comprising an amino acid sequence of SEQ ID NO: 732, and a HCDR3 comprising an amino acid sequence of SEQ ID NO: 852, a LCDR1 comprising an amino acid sequence of SEQ ID NO: 672, a LCDR2 comprising an amino acid sequence of SEQ ID NO: 792, and a LCDR3 comprising an amino acid sequence of SEQ ID NO: 912; and

wherein the second immunoglobulin variable region competes with a C5aR1 antibody molecule comprising:

a HCDR1 comprising an amino acid sequence of SEQ ID NO: 656, a HCDR2 comprising an amino acid sequence of SEQ ID NO: 776, and a HCDR3 comprising an amino acid sequence of SEQ ID NO: 896, a LCDR1 comprising an amino acid sequence of SEQ ID NO:

715, a LCDR2 comprising an amino acid sequence of SEQ ID NO: 835 and a LCDR3 comprising an amino acid sequence of SEQ ID NO: 955.

13. The multispecific antibody molecule of claim 11, wherein the antibody molecule comprises:
 - a first immunoglobulin variable region that binds to a first epitope, and a second immunoglobulin variable region that binds to a second epitope,
 - wherein the first epitope is on Site II of C5aR1;
 - wherein the first immunoglobulin variable region comprises: a HCDR1 comprising an amino acid sequence of SEQ ID NO: 612, a HCDR2 comprising an amino acid sequence of SEQ ID NO: 732, and a HCDR3 comprising an amino acid sequence of SEQ ID NO: 852, a LCDR1 comprising an amino acid sequence of SEQ ID NO: 672, a LCDR2 comprising an amino acid sequence of SEQ ID NO: 792, and a LCDR3 comprising an amino acid sequence of SEQ ID NO: 912;
 - wherein the second epitope is on Site I of C5aR; and
 - wherein the second immunoglobulin variable region comprises: HCDR1 comprising an amino acid sequence of SEQ ID NO: 656, a HCDR2 comprising an amino acid sequence of SEQ ID NO: 776, and a HCDR3 comprising an amino acid sequence of SEQ ID NO: 896, a LCDR1 comprising an amino acid sequence of SEQ ID NO: 715, a LCDR2 comprising an amino acid sequence of SEQ ID NO: 835 and a LCDR3 comprising an amino acid sequence of SEQ ID NO: 955.
14. A pharmaceutical composition comprising the antibody molecule of claim 1, optionally further comprising a pharmaceutically acceptable carrier or excipient.
15. A combination comprising the antibody molecule of claim 1 and a second therapeutic agent.
16. A nucleic acid molecule comprising a nucleotide sequence encoding the antibody molecule of claim 1.
17. A host cell comprising the nucleic acid molecule of claim 16.
18. A method of producing an anti-C5aR1 antibody molecule, the method comprising culturing the host cell of claim 17 under conditions that allow production of an antibody molecule, thereby producing the antibody molecule.

19. Use of a composition comprising an antibody molecule of claim 1 in the preparation of a medicament for use in treating a disease or disorder.
20. Use of a composition comprising an antibody molecule of claim 1 in the manufacture of a medication for modulating (e.g., decreasing) a C5aR1 activity, comprising contacting a cell or a subject in need thereof an effective amount of the antibody.