

CLAIMS

1. An isolated humanized anti-SIRP α antibody comprising a heavy chain comprising a variable heavy (V_H) chain sequence comprising three heavy chain CDR sequences, CDR-H1, CDR-H2, and CDR-H3, and a light chain comprising a variable light (V_L) chain sequence comprising three light chain CDR sequences, CDR-L1, CDR-L2, and CDR-L3, wherein:
CDR-H1 comprises the sequence set forth in SEQ ID NO:1; a CDR-H2 comprises the sequence set forth in SEQ ID NO:2; CDR-H3 comprises the sequence set forth in SEQ ID NO:3; CDR-L1 comprises the sequence set forth in SEQ ID NO:4; CDR-L2 comprises the sequence set forth in SEQ ID NO:5; and CDR-L3 comprises the sequence set forth in SEQ ID NO:6.
2. The isolated antibody of claim 1, wherein:
the V_H chain sequence comprises the V_H sequence set forth in SEQ ID NO:7 and the V_L chain sequence comprises the V_L sequence set forth in SEQ ID NO:8.
3. The isolated antibody of claim 2, wherein:
the heavy chain comprises the heavy chain sequence set forth in SEQ ID NO:17 and the light chain comprises the light chain sequence set forth in SEQ ID NO:18.
4. The isolated antibody of claim 1, wherein the antibody comprises a human Fc region with reduced Fc-dependent function(s).
5. The isolated antibody of claim 4, wherein the human Fc region is IgG1 or IgG4.
6. The isolated antibody of claim 4, wherein the human Fc region with reduced Fc-dependent function(s) comprises at least one modification that reduces binding to a human Fc receptor.
7. The isolated antibody of claim 6, wherein the human Fc region is IgG1 and the Fc region modification comprises a modification at EU index position asparagine 297.
8. The isolated antibody of claim 7, wherein the human IgG1 Fc region modification comprises an N297A amino acid substitution, numbering according to EU index.
9. The isolated antibody of claim 1, wherein the antibody:
 - (a) competes for binding to human SIRP α with a 1H9 antibody;
 - (b) does not compete for binding to human SIRP α with KWar antibody;
 - (c) partially competes for binding to human SIRP α with KWar antibody;
 - (d) inhibits binding of human CD47 to human SIRP α ;

- (e) inhibits binding of human SP-A to human SIRP α ;
 - (f) inhibits binding of human SP-D to human SIRP α ;
 - (g) binds to rhesus monkey SIRP α ;
 - (h) binds to cynomolgus SIRP α ;
 - (i) increases phagocytosis relative to control;
 - (j) binds each of human SIRP α alleles V1 and V2;
 - (k) binds each of human SIRP α alleles V1, V2, and V1/V5;
 - (l) binds human SIRP α allele V1;
 - (m) binds human SIRP α allele V2; or
 - (n) is capable of any combination of (a)-(m).
10. The isolated antibody of claim 1, wherein the antibody is pan-specific for human SIRP α isotypes.
 11. The isolated antibody of claim 1, wherein the antibody binds greater than one antigen or greater than one epitope on a single antigen.
 12. The isolated antibody of claim 1, wherein the V_H chain sequence consists of the V_H sequence set forth in SEQ ID NO:7 and the V_L chain sequence consists of the V_L sequence set forth in SEQ ID NO:8.
 13. The isolated antibody of claim 2, wherein the heavy chain consists of the sequence set forth in of SEQ ID NO:17 and the light chain consists of the sequence set forth in SEQ ID NO:18.
 14. The isolated antibody of claim 1, wherein the V_H sequence comprises the sequence set forth in SEQ ID NO:7 and the V_L sequence comprises the sequence set forth in SEQ ID NO:8; and wherein the antibody comprises a human Fc region with reduced Fc-dependent function(s).
 15. The isolated antibody of claim 1, wherein the V_H chain sequence comprises the V_H sequence set forth in SEQ ID NO:7 and the V_L chain sequence comprises the V_L sequence set forth in SEQ ID NO:8; and wherein the antibody comprises a human IgG1 Fc region with a modification at EU index position asparagine 297.
 16. The isolated antibody of claim 1, wherein the V_H chain sequence comprises the V_H sequence set forth in SEQ ID NO:7 and the V_L chain sequence comprises the V_L sequence set forth in SEQ ID NO:8; and wherein the antibody comprises a human

IgG1 Fc region with an N297A amino acid substitution, numbering according to EU index.

17. The isolated antibody of claim 2, wherein the heavy chain comprises the sequence set forth in of SEQ ID NO:17 and the light chain comprises the sequence set forth in SEQ ID NO:18; and wherein the antibody comprises a human Fc region with reduced Fc-dependent function(s).
18. The isolated antibody of claim 2, wherein the heavy chain comprises the sequence set forth in of SEQ ID NO:17 and the light chain comprises the sequence set forth in SEQ ID NO:18; and wherein the antibody comprises a human IgG1 Fc region with a modification at EU index position asparagine 297.
19. The isolated antibody of claim 2, wherein the heavy chain comprises the sequence set forth in of SEQ ID NO:17 and the light chain comprises the sequence set forth in SEQ ID NO:18; and wherein the antibody comprises a human IgG1 Fc region with an N297A amino acid substitution, numbering according to EU index.
20. A pharmaceutical composition comprising the antibody of claim 2 and a pharmaceutically acceptable excipient.
21. A pharmaceutical composition comprising the antibody of claim 3 and a pharmaceutically acceptable excipient.
22. A pharmaceutical composition comprising the antibody of claim 12 and a pharmaceutically acceptable excipient.
23. A pharmaceutical composition comprising the antibody of claim 15 and a pharmaceutically acceptable excipient.
24. An isolated polynucleotide or set of polynucleotides encoding the isolated antibody of claim 1, a V_H thereof, a V_L thereof, a light chain thereof, a heavy chain thereof, or an antigen-binding portion thereof.
25. A vector or set of vectors comprising the polynucleotide or set of polynucleotides of claim 24.
26. An isolated host cell comprising the polynucleotide or set of polynucleotides of claim 24.
27. A method of producing an antibody comprising expressing the antibody with the host cell of claim 26 and isolating the expressed antibody.
28. A pharmaceutical composition comprising the antibody of claim 1 and a pharmaceutically acceptable excipient.