What Is Claimed Is:

1. An isolated monoclonal antibody or immunologically active fragment thereof that binds to human CD47, comprising:

a variable heavy (VH) chain sequence that is at least 95% identical to an amino acid sequence selected from the group consisting of SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13, SEQ ID NO: 15, SEQ ID NO: 17, SEQ ID NO: 19, SEQ ID NO: 21, SEQ ID NO: 23, SEQ ID NO: 25, SEQ ID NO: 27, SEQ ID NO: 29, SEQ ID NO: 31, SEQ ID NO: 33, SEQ ID NO: 35, SEQ ID NO: 37, SEQ ID NO: 39, SEQ ID NO: 41, SEQ ID NO: 43, SEQ ID NO: 45, SEQ ID NO: 47, SEQ ID NO: 49, SEQ ID NO: 51, SEQ ID NO: 53, SEQ ID NO: 55, SEQ ID NO: 57, SEQ ID NO: 59, SEQ ID NO: 61, SEQ ID NO: 63, SEQ ID NO: 65, SEQ ID NO: 67, SEQ ID NO: 69, SEQ ID NO: 71, SEQ ID NO: 73, SEQ ID NO: 75, and SEQ ID NO: 77; and

a variable light (VL) chain sequence that is at least 95% identical to an amino acid sequence selected from the group consisting of SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, SEQ ID NO: 10, SEQ ID NO: 12, SEQ ID NO: 14, SEQ ID NO: 16, SEQ ID NO: 18, SEQ ID NO: 20, SEQ ID NO: 22, SEQ ID NO: 24, SEQ ID NO: 26, SEQ ID NO: 28, SEQ ID NO: 30, SEQ ID NO: 32, SEQ ID NO: 34, SEQ ID NO: 36, SEQ ID NO: 38, SEQ ID NO: 40, SEQ ID NO: 42, SEQ ID NO: 44, SEQ ID NO: 46, SEQ ID NO: 48, SEQ ID NO: 50, SEQ ID NO: 52, SEQ ID NO: 54, SEQ ID NO: 56, SEQ ID NO: 58, SEQ ID NO: 60, SEQ ID NO: 62, SEQ ID NO: 64, SEQ ID NO: 66, SEQ ID NO: 68, SEQ ID NO: 70, SEQ ID NO: 72, SEQ ID NO: 74, SEQ ID NO: 76, and SEQ ID NO: 78.

2. The isolated monoclonal antibody or immunologically active fragment thereof of claim 1, comprising a VH/VL pair, wherein the VH/VL pair comprises VH and VL chain sequences at least 95% identical to a pair of VH and VL amino acid sequences selected from the group consisting of SEQ ID NO: 1 and SEQ ID NO: 2, SEQ ID NO: 3 and SEQ ID NO: 4, SEQ ID NO: 5 and SEQ ID NO: 6, SEQ ID NO: 7 and SEQ ID NO: 8, SEQ ID NO: 9 and SEQ ID NO: 10, SEQ ID NO: 11 and SEQ ID NO: 12, SEQ ID NO: 13 and SEQ ID NO: 14, SEQ ID NO: 15 and SEQ ID NO: 16, SEQ ID NO: 17 and SEQ ID NO: 18, SEQ ID NO: 19 and SEQ ID NO: 20, SEQ ID NO: 21 and SEQ ID NO: 22, SEQ ID NO: 23 and SEQ ID NO: 24, SEQ ID NO: 25 and SEQ ID NO: 26, SEQ ID NO: 27 and SEQ ID NO: 28, SEQ ID NO: 29 and SEQ ID NO: 30, SEQ ID NO: 31 and SEQ ID NO: 32, SEQ ID NO: 33 and SEQ ID NO: 34, SEQ ID NO: 35 and SEQ ID NO: 36, SEQ ID NO: 37 and SEQ ID NO: 38, SEQ ID NO: 39 and SEQ ID NO: 40, SEQ ID

NO: 41 and SEQ ID NO: 42, SEQ ID NO: 43 and SEQ ID NO: 44, SEQ ID NO: 45 and SEQ ID NO: 46, SEQ ID NO: 47 and SEQ ID NO: 48, SEQ ID NO: 49 and SEQ ID NO: 50, SEQ ID NO: 51 and SEQ ID NO: 52, SEQ ID NO: 53 and SEQ ID NO: 54, SEQ ID NO: 55 and SEQ ID NO: 56, SEQ ID NO: 57 and SEQ ID NO: 58, SEQ ID NO: 59 and SEQ ID NO: 60, SEQ ID NO: 61 and SEQ ID NO: 62, SEQ ID NO: 63 and SEQ ID NO: 64, SEQ ID NO: 65 and SEQ ID NO: 66, SEQ ID NO: 67 and SEQ ID NO: 68, SEQ ID NO: 69 and SEQ ID NO: 70, SEQ ID NO: 71 and SEQ ID NO: 72, SEQ ID NO: 73 and SEQ ID NO: 74, SEQ ID NO: 75 and SEQ ID NO: 76, and SEQ ID NO: 77 and SEQ ID NO: 78.

3. The isolated monoclonal antibody or immunologically active fragment thereof of claim 1, comprising a VH/VL pair, wherein the VH/VL pair comprises VH and VL chain sequences selected from the group consisting of SEQ ID NO: 1 and SEQ ID NO: 2, SEQ ID NO: 3 and SEQ ID NO: 4, SEQ ID NO: 5 and SEQ ID NO: 6, SEQ ID NO: 7 and SEQ ID NO: 8 , SEQ ID NO: 9 and SEQ ID NO: 10, SEQ ID NO: 11 and SEQ ID NO: 12, SEQ ID NO: 13 and SEQ ID NO: 14, SEQ ID NO: 15 and SEQ ID NO: 16, SEQ ID NO: 17 and SEQ ID NO: 18, SEQ ID NO: 19 and SEQ ID NO: 20, SEQ ID NO: 21 and SEQ ID NO: 22, SEQ ID NO: 23 and SEQ ID NO: 24, SEQ ID NO: 25 and SEQ ID NO: 26, SEQ ID NO: 27 and SEQ ID NO: 28, SEQ ID NO: 29 and SEQ ID NO: 30, SEQ ID NO: 31 and SEQ ID NO: 32, SEQ ID NO: 33 and SEQ ID NO: 34, SEQ ID NO: 35 and SEQ ID NO: 36, SEQ ID NO: 37 and SEQ ID NO: 38, SEQ ID NO: 39 and SEQ ID NO: 40, SEQ ID NO: 41 and SEQ ID NO: 42, SEQ ID NO: 43 and SEQ ID NO: 44, SEQ ID NO: 45 and SEQ ID NO: 46, SEQ ID NO: 47 and SEQ ID NO: 48, SEQ ID NO: 49 and SEQ ID NO: 50, SEQ ID NO: 51 and SEQ ID NO: 52, SEQ ID NO: 53 and SEQ ID NO: 54, SEQ ID NO: 55 and SEQ ID NO: 56, SEQ ID NO: 57 and SEQ ID NO: 58, SEQ ID NO: 59 and SEQ ID NO: 60, SEQ ID NO: 61 and SEQ ID NO: 62, SEQ ID NO: 63 and SEQ ID NO: 64, SEQ ID NO: 65 and SEQ ID NO: 66, SEQ ID NO: 67 and SEQ ID NO: 68, SEQ ID NO: 69 and SEQ ID NO: 70, SEQ ID NO: 71 and SEQ ID NO: 72, SEQ ID NO: 73 and SEQ ID NO: 74, SEQ ID NO: 75 and SEQ ID NO: 76, and SEQ ID NO: 77 and SEQ ID NO: 78.

4. The isolated monoclonal antibody or immunologically active fragment thereof of claim 1, wherein the isolated monoclonal antibody or immunologically active fragment thereof is chimeric or humanized.

5. The isolated monoclonal antibody or immunologically active fragment thereof of claim 1, wherein the isolated monoclonal antibody or immunologically active fragment thereof prevents human CD47 from interacting with signal-regulatory-protein α (SIRPα).

6. The isolated monoclonal antibody or immunologically active fragment thereof of claim 1, wherein the isolated monoclonal antibody or immunologically active fragment thereof promotes macrophage-mediated phagocytosis of a CD47-expressing cell.
7. The isolated monoclonal antibody or immunologically active fragment thereof of claim 1, wherein the isolated monoclonal antibody or immunologically active fragment thereof does not cause a significant level of hemagglutination or depletion of red blood cells.
8. The isolated monoclonal antibody or immunologically active fragment thereof of claim 1, wherein the isolated monoclonal antibody or immunologically active fragment thereof does not cause hemagglutination or depletion of red blood cells.
9. An isolated bispecific monoclonal antibody comprising a first arm and a second arm, wherein the first arm comprises a first monoclonal antibody or immunologically active fragment thereof of any of claims 1-8 which binds human CD47, and the second arm comprise a second monoclonal antibody that does not bind human CD47.
10. The bispecific monoclonal antibody of claim 9, wherein the second arm binds to a cancer cell.
11. The bispecific monoclonal antibody of claim 8 or 9, wherein the bispecific monoclonal antibody inhibits interaction between human CD47 and human SIRPα.
12. A pharmaceutical composition comprising an isolated monoclonal antibody or immunologically active fragment thereof of any of claims 1-8 or a bispecific monoclonal antibody of any of claims 9-11, and a pharmaceutically acceptable carrier.
13. A method for treating a disease in a human subject in need thereof, comprising administering to the subject a therapeutically effective amount of an isolated monoclonal antibody or immunologically active fragment thereof of any of claims 1-8 or a bispecific monoclonal antibody of any of claims 9-11, or a pharmaceutical composition of claim 11; wherein the disease is cancer, a fibrotic disease, a disease related to inhibition of phagocytosis, or a disease related to platelet aggregation.
14. The method of claim 13, wherein the cancer is selected from the group consisting of: ovarian cancer, colon cancer, breast cancer, lung cancer, head and neck cancer, bladder cancer, colorectal cancer, pancreatic cancer, non-Hodgkin's lymphoma, acute lymphocytic leukemia, chronic lymphocytic leukemia, acute myeloid leukemia, chronic myelogenous leukemia, hairy cell leukemia (HCL), T-cell prolymphocytic leukemia (T-PLL), large granular lymphocytic leukemia, adult T-cell leukemia, multiple myeloma,

melanoma, leiomyoma, leiomyosarcoma, glioma, glioblastoma, myelomas, monocytic leukemias, B-cell derived leukemias, T-cell derived leukemias, B-cell derived lymphomas, T-cell derived lymphomas, endometrial cancer, kidney cancer, melanoma, prostate cancer, thyroid cancer, cervical cancer, gastric cancer, liver cancer, and solid tumors; the fibrotic disease is selected from the group consisting of: myocardial infarction, angina, osteoarthritis, pulmonary fibrosis, asthma, cystic fibrosis, bronchitis, and asthma; the disease related to inhibition of phagocytosis is a cardiovascular disease; the disease related to platelet aggregation is Glanzmann Thrombasthenia, prolonged bleeding time, immune thrombocytopenia (ITP), von Willebrand disease (vWD).

15. The method of claim 14, wherein the cardiovascular disease is selected from the group consisting of atherosclerosis, stroke, hypertensive heart disease, rheumatic heart disease, cardiomyopathy, heart arrhythmia, congenital heart disease, valvular heart disease, carditis, aortic aneurysms, peripheral artery disease, and venous thrombosis.

16. A fusion protein comprising a first amino acid sequence and a second amino acid sequence, wherein the first amino acid sequence is SEQ ID NO: 1, SEQ ID NO: 3, SEQ ID NO: 5, SEQ ID NO: 7, SEQ ID NO: 9, SEQ ID NO: 11, SEQ ID NO: 13, SEQ ID NO: 15, SEQ ID NO: 17, SEQ ID NO: 19, SEQ ID NO: 21, SEQ ID NO: 23, SEQ ID NO: 25, SEQ ID NO: 27, SEQ ID NO: 29, SEQ ID NO: 31, SEQ ID NO: 33, SEQ ID NO: 35, SEQ ID NO: 37, SEQ ID NO: 39, SEQ ID NO: 41, SEQ ID NO: 43, SEQ ID NO: 45, SEQ ID NO: 47, SEQ ID NO: 49, SEQ ID NO: 51, SEQ ID NO: 53, SEQ ID NO: 55, SEQ ID NO: 57, SEQ ID NO: 59, SEQ ID NO: 61, SEQ ID NO: 63, SEQ ID NO: 65, SEQ ID NO: 67, SEQ ID NO: 69, SEQ ID NO: 71, SEQ ID NO: 73, SEQ ID NO: 75, or SEQ ID NO: 77, or an amino acid sequence that is at least 95% identical thereto; and the second amino acid sequence is SEQ ID NO: 2, SEQ ID NO: 4, SEQ ID NO: 6, SEQ ID NO: 8, SEQ ID NO: 10, SEQ ID NO: 12, SEQ ID NO: 14, SEQ ID NO: 16, SEQ ID NO: 18, SEQ ID NO: 20, SEQ ID NO: 22, SEQ ID NO: 24, SEQ ID NO: 26, SEQ ID NO: 28, SEQ ID NO: 30, SEQ ID NO: 32, SEQ ID NO: 34, SEQ ID NO: 36, SEQ ID NO: 38, SEQ ID NO: 40, SEQ ID NO: 42, SEQ ID NO: 44, SEQ ID NO: 46, SEQ ID NO: 48, SEQ ID NO: 50, SEQ ID NO: 52, SEQ ID NO: 54, SEQ ID NO: 56, SEQ ID NO: 58, SEQ ID NO: 60, SEQ ID NO: 62, SEQ ID NO: 64, SEQ ID NO: 66, SEQ ID NO: 68, SEQ ID NO: 70, SEQ ID NO: 72, SEQ ID NO: 74, SEQ ID NO: 76, or SEQ ID NO: 78, or an amino acid sequence that is at least 95% identical thereto.

17. The fusion protein of claim 16, comprising a combination of the first amino acid sequence and the second amino acid sequence, and the combination is SEQ ID NO: 1 and SEQ ID NO: 2, SEQ ID NO: 3 and SEQ ID NO: 4, SEQ ID NO: 5 and SEQ ID NO: 6, SEQ ID NO: 7 and SEQ ID NO: 8, SEQ ID NO: 9 and SEQ ID NO: 10, SEQ ID NO: 11 and SEQ ID NO: 12, SEQ ID NO: 13 and SEQ ID NO: 14, SEQ ID NO: 15 and SEQ ID NO: 16, SEQ ID NO: 17 and SEQ ID NO: 18, SEQ ID NO: 19 and SEQ ID NO: 20, SEQ ID NO: 21 and SEQ ID NO: 22, SEQ ID NO: 23 and SEQ ID NO: 24, SEQ ID NO: 25 and SEQ ID NO: 26, SEQ ID NO: 27 and SEQ ID NO: 28, SEQ ID NO: 29 and SEQ ID NO: 30, SEQ ID NO: 31 and SEQ ID NO: 32, SEQ ID NO: 33 and SEQ ID NO: 34, SEQ ID NO: 35 and SEQ ID NO: 36, SEQ ID NO: 37 and SEQ ID NO: 38, SEQ ID NO: 39 and SEQ ID NO: 40, SEQ ID NO: 41 and SEQ ID NO: 42, SEQ ID NO: 43 and SEQ ID NO: 44, SEQ ID NO: 45 and SEQ ID NO: 46, SEQ ID NO: 47 and SEQ ID NO: 48, SEQ ID NO: 49 and SEQ ID NO: 50, SEQ ID NO: 51 and SEQ ID NO: 52, SEQ ID NO: 53 and SEQ ID NO: 54, SEQ ID NO: 55 and SEQ ID NO: 56, SEQ ID NO: 57 and SEQ ID NO: 58, SEQ ID NO: 59 and SEQ ID NO: 60, SEQ ID NO: 61 and SEQ ID NO: 62, SEQ ID NO: 63 and SEQ ID NO: 64, SEQ ID NO: 65 and SEQ ID NO: 66, SEQ ID NO: 67 and SEQ ID NO: 68, SEQ ID NO: 69 and SEQ ID NO: 70, SEQ ID NO: 71 and SEQ ID NO: 72, SEQ ID NO: 73 and SEQ ID NO: 74, SEQ ID NO: 75 and SEQ ID NO: 76, or SEQ ID NO: 77 and SEQ ID NO: 78, or a combination that is at least 95% identical thereto for each of the first and second amino acid sequences.

18. The fusion protein of claim 16 or 17, comprising a combination of the first amino acid sequence and the second amino acid sequence, and the combination is SEQ ID NO: 1 and SEQ ID NO: 2, SEQ ID NO: 3 and SEQ ID NO: 4, SEQ ID NO: 5 and SEQ ID NO: 6, SEQ ID NO: 7 and SEQ ID NO: 8, SEQ ID NO: 9 and SEQ ID NO: 10, SEQ ID NO: 11 and SEQ ID NO: 12, SEQ ID NO: 13 and SEQ ID NO: 14, SEQ ID NO: 15 and SEQ ID NO: 16, SEQ ID NO: 17 and SEQ ID NO: 18, SEQ ID NO: 19 and SEQ ID NO: 20, SEQ ID NO: 21 and SEQ ID NO: 22, SEQ ID NO: 23 and SEQ ID NO: 24, or SEQ ID NO: 25 and SEQ ID NO: 26, SEQ ID NO: 27 and SEQ ID NO: 28, SEQ ID NO: 29 and SEQ ID NO: 30, SEQ ID NO: 31 and SEQ ID NO: 32, SEQ ID NO: 33 and SEQ ID NO: 34, SEQ ID NO: 35 and SEQ ID NO: 36 (16H3), SEQ ID NO: 37 and SEQ ID NO: 38, SEQ ID NO: 39 and SEQ ID NO: 40, SEQ ID NO: 41 and SEQ ID NO: 42, SEQ ID NO: 43 and SEQ ID NO: 44, SEQ ID NO: 45 and SEQ ID NO: 46, SEQ ID NO: 47 and SEQ ID NO: 48, SEQ ID NO: 49 and SEQ ID NO: 50, SEQ ID NO: 51 and SEQ ID NO: 52, SEQ ID NO: 53 and SEQ ID NO: 54, SEQ ID NO: 55 and SEQ ID NO: 56, SEQ ID NO: 57 and

SEQ ID NO: 58, SEQ ID NO: 59 and SEQ ID NO: 60, SEQ ID NO: 61 and SEQ ID NO: 62, SEQ ID NO: 63 and SEQ ID NO: 64, SEQ ID NO: 65 and SEQ ID NO: 66, SEQ ID NO: 67 and SEQ ID NO: 68, SEQ ID NO: 69 and SEQ ID NO: 70, SEQ ID NO: 71 and SEQ ID NO: 72, SEQ ID NO: 73 and SEQ ID NO: 74, SEQ ID NO: 75 and SEQ ID NO: 76, or SEQ ID NO: 77 and SEQ ID NO: 78.

19. The fusion protein of any of claims 16-18, further comprising an additional protein in addition to the first and second amino acid sequences.
20. The fusion protein of claim 19, wherein the additional protein is an antibody or a cytokine.
21. The fusion protein of any of claims 16-20, wherein the fusion protein is conjugated with a small-molecule therapeutic agent or a marker.
22. The fusion protein of claim 21 wherein the small molecule therapeutic agent is an anti-cancer or anti-inflammation agent; and the marker is a biomarker or fluorescent marker.
23. An immunodominant epitope encoded by the CD47 gene comprising a recombinant protein containing conformationally a TNMEAQ loop (residues 26-31), T34, E35, L74, and an LTR hinge (residues 101-103) of CD47.
24. A biological molecule that specifically binds to a conformational epitope having an amino acid sequence comprising a TNMEAQ loop (residues 26-31), T34, E35, L74, and an LTR hinge (residues 101-103) of CD47, wherein the antibody can specifically bind to CD47.