CLAIMS

What is claimed is:

1. An antibody or antigen-binding fragment thereof having binding specificity to a wild-type human signal regulatory protein alpha (SIRPα) protein, wherein the antibody or fragment thereof comprises a heavy chain variable region (VH) comprising heavy chain complementarity determining regions CDR1, CDR2, and CDR3 having the amino acid sequences of VH CDR1, VH CDR2, and VH CDR3 of SEQ ID NO: 43 respectively, and a light chain variable region (VL) comprising complementarity determining regions CDR1, CDR2, and CDR3 having the amino acid sequences of VL CDR1, VL CDR2, and VL CDR3 of SEQ ID NO:45 respectively.

2. The antibody or antigen-binding fragment thereof of claim 1, wherein the VH CDR1, VH CDR2, and VH CDR3 of SEQ ID NO:43 and the VL CDR1, VL CDR2, and VL CDR3 of SEQ ID NO:45 are defined according to the Kabat system.

3. The antibody or antigen-binding fragment thereof of claim 1, wherein the VH CDR1, VH CDR2, and VH CDR3 of SEQ ID NO:43 and the VL CDR1, VL CDR2, and VL CDR3 of SEQ ID NO:45 are defined according to the Chothia system.

4. The antibody or antigen-binding fragment thereof of claim 1, wherein the heavy chain variable region has the amino acid sequence of SEQ ID NO:43 and the light chain variable region has the amino acid sequence of SEQ ID NO:45.

5. The antibody or fragment thereof of any one of claims 1-4, which further has a binding specificity to a second target protein.

6. A composition comprising the antibody or fragment thereof of any one of claims 1-5 and a pharmaceutically acceptable carrier.

7. The composition of claim 6, further comprising a second antibody having specificity to a tumor antigen.

8. The composition of claim 7, wherein the second antibody is a tumor-opsonizing antibody.

9. Use of the antibody or antigen-binding fragment thereof of any one of claims 1-5 in the manufacture of a medicament for treating cancer.

10. The use of claim 9, wherein the cancer is selected from the group consisting of bladder cancer, liver cancer, colon cancer, rectal cancer, endometrial cancer, leukemia, lymphoma, pancreatic cancer, small cell lung cancer, non-small cell lung cancer, breast cancer, urethral cancer, head and neck cancer, gastrointestinal cancer, stomach cancer, oesophageal cancer, ovarian cancer, renal cancer, melanoma, prostate cancer and thyroid cancer.

11. The use of claim 9 or claim 10, wherein the medicament is to be administered with a second antibody targeting a protein that triggers tumor opsonizing.

12. The use of claim 11, wherein the protein is selected from the group consisting of CD19, CD20, EGFR, HER2, CD3, CD16, PD1, PD-L1, LAG3, TIM3, CTLA4, VISTA, CSFR1, A2AR, CD73, CD39, CD40, CEA, HER2, VEGFR, TIGIT, claudin18.2, CD24, GPC3, Il13RA2, 4-1BB, CCR8, and CMET.