

CLAIMS

1. An isolated anti-CD47 antibody or antigen-binding fragment thereof, comprising
- 5 (1) one to three selected from HCDR1, HCDR2 and HCDR3 of a heavy chain variable region (VH), wherein the amino acid sequence of the VH is as set forth in SEQ ID NO: 1, 3, 5, 6 or 7; and/or
- (2) one to three selected from LCDR1, LCDR2 and LCDR3 of a light chain variable region (VL), wherein the amino acid sequence of the VL is as set forth in SEQ ID NO: 2, 10 4, 8, 9 or 10.
2. The antibody or antigen-binding fragment thereof of claim 1, comprising HCDR1, HCDR2 and HCDR3 of a VH and LCDR1, LCDR2 and LCDR3 of a VL, wherein the VH and VL are selected from:
- 15 (1) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 1, and a VL comprising the amino acid sequence as set forth in SEQ ID NO: 2;
- (2) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 3, and a VL comprising the amino acid sequence as set forth in SEQ ID NO: 4;
- (3) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 5, and a 20 VL comprising the amino acid sequence as set forth in SEQ ID NO: 8, 9 or 10;
- (4) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 6, and a VL comprising the amino acid sequence as set forth in SEQ ID NO: 9 or 10; or
- (5) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 7, and a VL comprising the amino acid sequence as set forth in SEQ ID NO: 8, 9 or 10.
- 25 3. An isolated anti-CD47 antibody or antigen-binding fragment thereof, comprising
- (1) one to three selected from heavy chain complementary determining region 1 (HCDR1), HCDR2 and HCDR3, wherein the HCDR1 comprises the amino acid 30 sequence as set forth in SEQ ID NO: 11, the HCDR2 comprises the amino acid sequence as set forth in SEQ ID NO: 12, and the HCDR3 comprises the amino acid sequence as set forth in SEQ ID NO: 13 or 17 or 21; and/or

(2) one to three selected from light chain complementary determining region 1 (LCDR1), LCDR2 and LCDR3, wherein the LCDR1 comprises the amino acid sequence as set forth in SEQ ID NO: 14, the LCDR2 comprises the amino acid sequence as set forth in SEQ ID NO: 15 or 18 or 22, and the LCDR3 comprises the amino acid sequence as set forth in SEQ ID NO: 16.

4. The antibody or antigen-binding fragment thereof of claim 3, comprising
(1) heavy chain complementary determining region 1 (HCDR1), HCDR2 and HCDR3, wherein the HCDR1 comprises the amino acid sequence as set forth in SEQ ID NO: 11, the HCDR2 comprises the amino acid sequence as set forth in SEQ ID NO: 12, and the HCDR3 comprises the amino acid sequence as set forth in SEQ ID NO: 13 or 17 or 21; and/or

(2) light chain complementary determining region 1 (LCDR1), LCDR2 and LCDR3, wherein the LCDR1 comprises the amino acid sequence as set forth in SEQ ID NO: 14, the LCDR2 comprises the amino acid sequence as set forth in SEQ ID NO: 15 or 18 or 22, and the LCDR3 comprises the amino acid sequence as set forth in SEQ ID NO: 16.

5. The antibody or antigen-binding fragment thereof of any one of claims 1-3, wherein

(1) the HCDR1 comprises the amino acid sequence as set forth in SEQ ID NO: 11, the HCDR2 comprises the amino acid sequence as set forth in SEQ ID NO: 12, and the HCDR3 comprises the amino acid sequence as set forth in SEQ ID NO: 17; and/or

(2) the LCDR1 comprises the amino acid sequence as set forth in SEQ ID NO: 14, the LCDR2 comprises the amino acid sequence as set forth in SEQ ID NO: 18, and the LCDR3 comprises the amino acid sequence as set forth in SEQ ID NO: 16.

6. The antibody or antigen-binding fragment thereof of any one of claims 1-3, comprising

(1) a heavy chain variable region (VH) comprising an amino acid sequence identical to or having at least 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% sequence identity to the amino acid sequence as set forth in SEQ ID NO: 1, 3, 5, 6 or 7; and/or

(2) a light chain variable region (VL) comprising an amino acid sequence identical to or having at least 90%, 91%, 92%, 93%, 94%, 95%, 96%, 97%, 98% or 99% sequence identity to the amino acid sequence as set forth in SEQ ID NO: 2, 4, 8, 9 or 10.

5 7. The antibody or antigen-binding fragment thereof of claim 6, wherein the VH comprises the amino acid sequence as set forth in any one of SEQ ID NOs: 1, 3, 5, 6 and 7, and the VL comprises the amino acid sequence as set forth in any one of SEQ ID NOs: 2, 4, 8, 9 and 10.

10 8. The antibody or antigen-binding fragment thereof of claim 7, comprising a heavy chain variable region (VH) and a light chain variable region (VL), wherein the VH and VL are selected from

(1) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 1; and a VL comprising the amino acid sequence as set forth in SEQ ID NO: 2;

15 (2) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 3; and a VL comprising the amino acid sequence as set forth in SEQ ID NO: 4;

(3) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 5; and a VL comprising the amino acid sequence as set forth in SEQ ID NO: 8, 9 or 10;

(4) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 6; and a
20 VL comprising the amino acid sequence as set forth in SEQ ID NO: 9 or 10; or

(5) a VH comprising the amino acid sequence as set forth in SEQ ID NO: 7; and a VL comprising the amino acid sequence as set forth in SEQ ID NO: 8, 9 or 10.

9. The antibody or antigen-binding fragment thereof of claim 8, comprising a
25 heavy chain variable region (VH) and/or a light chain variable region (VL), wherein the VH comprises the amino acid sequence as set forth in SEQ ID NO: 7, and the VL comprises the amino acid sequence as set forth in SEQ ID NO: 8.

10. The antibody or antigen-binding fragment thereof of any of the preceding
30 claims, comprising a heavy chain constant region, such as a human IgG1 constant region, a human IgG1TM constant region, a human IgG4 constant region or a human IgG4P constant region.

11. The antibody or antigen-binding fragment thereof of any of the preceding claims, comprising a light chain constant region, such as a human κ light chain constant region.

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12. The antibody or antigen-binding fragment thereof of any of the preceding claims, which is a murine antibody, a chimeric antibody or a humanized antibody.

13. The antibody or antigen-binding fragment thereof of any of the preceding claims, which is a full-length antibody, a single-chain antibody, a single-domain antibody such as a VHH, a Fab, a Fab', a Fab'-SH, a (Fab')₂, a single-chain antibody such as a scFv, a Fv, a dAb (domain antibody) or a bis (multi) -specific antibody.

14. An isolated nucleic acid, encoding the antibody or antigen-binding fragment thereof of any one of claims 1-13.

15. A recombinant vector or an expression vector, comprising one or more nucleic acids of claim 14, wherein the vector is suitable for the recombinant production of the antibody or antigen-binding fragment thereof of any one of claims 1-13.

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16. A host cell, comprising one or more recombinant vectors or expression vectors of claim 15.

17. An immunoconjugate or immune fusion, comprising the antibody or antigen-binding fragment thereof of any one of claims 1-13.

18. A pharmaceutical composition, comprising the antibody or antigen-binding fragment thereof of any one of claims 1-13, the nucleic acid of claim 14, the vector of claim 15, the host cell of claim 16, or the immunoconjugate or immune fusion of claim 17, and optionally comprising a pharmaceutically acceptable excipient.

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19. A method for treating or preventing cancer, comprising administering to an individual an effective amount of the antibody or antigen-binding fragment thereof of any one of claims 1-13, the nucleic acid of claim 14, the vector of claim 15, the host cell of claim 16, the immunoconjugate or immune fusion of claim 17, or the pharmaceutical composition of claim 18.

20. The method of claim 19, wherein the cancer comprises hematological cancer and solid tumor, such as bladder cancer, pancreatic cancer, lymphoma, leukemia, multiple myeloma, (malignant) melanoma, liomyoma, leiomyosarcomas, glioma, glioblastoma, myeloma, endometrial cancer, renal carcinoma, (benign) melanoma, prostate cancer, thyroid carcinoma, cervical cancer, gastric cancer, liver cancer, colon cancer, ovarian cancer, urothelial carcinoma, and so on.

21. A method for detecting CD47 protein in a sample, comprising:

(a) contacting a sample with the isolated antibody or antigen-binding fragment thereof of any one of claims 1-13 or the immunoconjugate or immune fusion of claim 17; and

(b) detecting the formation of the complex between the antibody or antigen-binding fragment thereof or the immunoconjugate or the immune fusion and the CD47 protein.