CLAIMS

1. A purified humanized antibody or antigen binding fragment thereof that specifically binds to CD37, wherein said antibody or fragment thereof retains the ability of at least its chimeric or murine parent antibody to induce apoptosis of a cell expressing CD37 *in vitro* in the absence of cross-linking.

2. An antibody or antigen-binding fragment thereof that specifically binds to the same CD37 epitope as an antibody selected from the group consisting of:
(a) an antibody comprising the polypeptide of SEQ ID NO:57 or SEQ ID NO:58 and the polypeptide of SEQ ID NO:198;
(b) an antibody comprising the polypeptide of SEQ ID NO:63 and the polypeptide of SEQ ID NO:79;
(c) an antibody comprising the polypeptide of SEQ ID NO:65 and the polypeptide of SEQ ID NO:81;
(d) an antibody comprising the polypeptide of SEQ ID NO:67 and the polypeptide of SEQ ID NO:83;
(e) an antibody comprising the polypeptide of SEQ ID NO:69 and the polypeptide of SEQ ID NO:85; and
(f) an antibody comprising the polypeptide of SEQ ID NO:71 and the polypeptide of SEQ ID NO:87.

3. The antibody or antigen-binding fragment of claim 1 or claim 2, wherein the antibody or antigen-binding fragment is capable of inducing antibody dependent cell mediated cytotoxicity (ADCC).

4. The antibody or antigen binding fragment thereof of claim 1 or claim 2, wherein the antibody or antigen binding fragment thereof that specifically binds to CD37 comprises variable heavy chain CDR 1, 2, and 3 and variable light chain CDR 1, 2, and 3 polypeptide sequences selected from the group consisting of:
(a) SEQ ID NOs: 4, 5, and 6 and SEQ ID NOs: 28, 29, and 30, respectively;

(b) SEQ ID NOs: 10, 11, and 12 and SEQ ID NOs: 34, 35, and 36, respectively;
(c) SEQ ID NOs: 13, 14, and 15 and SEQ ID NOs: 37, 40, and 39, respectively;
(d) SEQ ID NOs: 16, 17, and 18 and SEQ ID NOs: 41, 42, and 43, respectively;
(e) SEQ ID NOs: 19, 20, and 21 and SEQ ID NOs: 44, 47, and 46, respectively;
(f) SEQ ID NOs: 22, 23, and 24 and SEQ ID NOs: 48, 51, and 50, respectively;
(g) SEQ ID NOs: 25, 26, and 27 and SEQ ID NOs: 52, 53, and 54, respectively; and
(h) variants of (a) to (g) comprising 1, 2, 3, or 4 conservative amino acid substitutions.

5. The antibody or antigen binding fragment thereof of claim 1 or 2, wherein the antibody or antigen binding fragment thereof that specifically binds to CD37 comprises variable heavy chain CDR 1, 2, and 3 and variable light chain CDR 1, 2, and 3 polypeptide sequences selected from the group consisting of:

(a) SEQ ID NOs: 4, 5, and 6 and SEQ ID NOs: 28, 29, and 30, respectively;
(b) SEQ ID NOs: 10, 11, and 12 and SEQ ID NOs: 34, 35, and 36, respectively;
(c) SEQ ID NOs: 13, 14, and 15 and SEQ ID NOs: 37, 40, and 39, respectively;
(d) SEQ ID NOs: 16, 17, and 18 and SEQ ID NOs: 41, 42, and 43, respectively;
(e) SEQ ID NOs: 19, 20, and 21 and SEQ ID NOs: 44, 47, and 46, respectively;
(f) SEQ ID NOs: 22, 23, and 24 and SEQ ID NOs: 48, 51, and 50, respectively; and
(g) SEQ ID NOs: 25, 26, and 27 and SEQ ID NOs: 52, 53, and 54, respectively.

6. The antibody or antigen binding fragment thereof of any one of claims 1 to 5, wherein the antibody or antigen binding fragment thereof comprises polypeptide sequences that are at least 90%, 95%, 99%, identical to polypeptide sequences selected from the group consisting of:

(a) SEQ ID NO:57 and SEQ ID NO:198;
(b) SEQ ID NO:58 and SEQ ID NO:198;
(c) SEQ ID NO:63 and SEQ ID NO:79;
(d) SEQ ID NO:65 and SEQ ID NO:81;
(e) SEQ ID NO:67 and SEQ ID NO:83;
(f) SEQ ID NO:69 and SEQ ID NO:85; and
(g) SEQ ID NO:71 and SEQ ID NO:87.

7. The antibody or antigen binding fragment of claim 6, wherein the antibody or antigen binding fragment comprises polypeptide selected from the group consisting of:

(a) SEQ ID NO: 57 and SEQ ID NO: 198;
(b) SEQ ID NO: 58 and SEQ ID NO: 198;
(c) SEQ ID NO: 63 and SEQ ID NO: 79;
(d) SEQ ID NO: 65 and SEQ ID NO: 81;
(e) SEQ ID NO: 67 and SEQ ID NO: 83;
(f) SEQ ID NO: 69 and SEQ ID NO: 85; and
(g) SEQ ID NO: 71and the polypeptide of SEQ ID NO: 87.

8. The antibody or antigen binding fragment thereof of any one of claims 1 to 7, wherein the antibody a resurfaced antibody.

9. (New) The antibody or antigen-binding fragment thereof of any one of claims 1 to 8, wherein the antibody or antigen-binding fragment thereof comprises a variable heavy chain comprising the sequence of SEQ ID NO:57 and a variable light chain comprising the sequence of SEQ ID NO:198.

10. The antibody or antigen binding fragment thereof of any one of claims 1-9, wherein the antibody or antigen binding fragment thereof comprises a Fab, Fab', $F(ab')_2$, Fd, single chain Fv ~~or scFv~~, disulfide linked Fv, V-NAR domain, IgNar, intrabody, IgGΔCH2, minibody, $F(ab')_3$, tetrabody, triabody, diabody, single-domain antibody, DVD-Ig, Fcab, mAb^2, $(scFv)_2$, or scFv-Fc.

11. An isolated cell producing the antibody or antigen binding fragment thereof of any one of claims 1 to 10.

12. An immunoconjugate having the formula (A) - (L) - (C), wherein:

(A) is an antibody or antigen binding fragment of any one of claims 1 to 10;
(L) is a linker; and
(C) is a cytotoxic agent; and
wherein said linker (L) links (A) to (C).

13. The immunoconjugate of claim 12, comprising two, three, four, two-six, or three-four (C)s.

14. The immunoconjugate of claim 12 or 13, wherein the linker is selected from the group consisting: N-succinimidyl 4-(2-pyridyldithio)pentanoate (SPP); N-succinimidyl 4-(2-pyridyldithio)butanoate (SPDB) or N-succinimidyl 4-(2-pyridyldithio)-2-sulfobutanoate (sulfo-SPDB); N-succinimidyl 4-(maleimidomethyl) cyclohexanecarboxylate (SMCC); N-sulfosuccinimidyl 4-(maleimidomethyl) cyclohexanecarboxylate (sulfoSMCC); N-succinimidyl-4-(iodoacetyl)-aminobenzoate (SIAB); and N-succinimidyl-[(N-maleimidopropionamido)-tetraethyleneglycol] ester (NHS-PEG4-maleimide).

15. The immunoconjugate of claim 14, wherein said linker is SMCC.

16. The immunoconjugate of any one of claims 12 to 15, wherein said cytotoxic agent is selected from the group consisting of a maytansinoid, maytansinoid analog, doxorubicin, a modified doxorubicin, benzodiazepine, taxoid, CC-1065, CC-1065 analog, duocarmycin, duocarmycin analog, calicheamicin, dolastatin, dolastatin analog, auristatin, tomaymycin derivative, and leptomycin derivative or a prodrug of the agent.

17. The immunoconjugate of claim 16, wherein said cytotoxic agent is a maytansinoid.

18. The immunoconjugate of claim 17, wherein said cytotoxic agent is N(2')-deacetyl-N(2')-(3-mercapto-1-oxopropyl)-maytansine (DM1) or N(2')-deacetyl-N(2')-(4-mercapto-4-methyl-1-oxopentyl)-maytansine (DM4).

19. The immunoconjugate of claim 12, wherein the linker is SMCC.

20. The immunoconjugate of claim 12, wherein (A) is an antibody comprising the polypeptide of SEQ ID NO:57 and the polypeptide of SEQ ID NO:198, wherein (L) is SMCC, and wherein (C) is DM1.

21. A pharmaceutical composition comprising the antibody or antigen binding fragment thereof of any one of claims 1 to 10, or the immunoconjugate of any one of claims 12 to 20 and a pharmaceutically acceptable carrier.

22. A pharmaceutical composition comprising the immunoconjugate of any one of claims 12 to 20, wherein the immunoconjugate has an average of about 3 to about 4 (C) per (A) or an average of about 3.5 (C) per (A).

23. A kit comprising the antibody or antigen binding fragment thereof of any one of claims 1 to 10, the immunoconjugate of any one of claims 12 to 20, or the pharmaceutical composition of 21 or 22.

24. An *in vitro* method for inhibiting the growth of a cell expressing CD37 comprising contacting the cell with the antibody or antigen binding fragment thereof of any one of claims 1 to 10, or the immunoconjugate of any one of claims 12 to 20.

25. Use of the antibody or antigen binding fragment thereof of any one of claims 1 to 10, the immunoconjugate of any one of claims 12 to 20, or the pharmaceutical composition of claims 21 or 22 in the manufacture of a medicament for treatment of cancer.

26. The use of claim 25, wherein said cancer is selected from the group consisting of B cell lymphomas, NHL, precursor B cell lymphoblastic leukemia/lymphoma and mature B cell neoplasms, B cell chronic lymphocytic leukemia (CLL)/small lymphocytic lymphoma (SLL), B cell prolymphocytic leukemia, lymphoplasmacytic lymphoma, mantle cell lymphoma (MCL), follicular lymphoma (FL), low grade, intermediate-grade and high-grade (FL), cutaneous follicle center lymphoma, marginal zone B cell lymphoma, MALT type marginal zone B cell lymphoma, nodal marginal zone B cell lymphoma, splenic type marginal zone B cell lymphoma, hairy cell leukemia, diffuse large B cell lymphoma, Burkitt's lymphoma, plasmacytoma, plasma cell myeloma, post-transplant lymphoproliferative disorder, Waldenstrom's macroglobulinemia, and anaplastic large-cell lymphoma (ALCL).

27. The use of claim 25, wherein the cancer is leukemia or lymphoma.

28. An isolated polynucleotide comprising a sequence that encodes a sequence selected from the group consisting of SEQ ID NOs: 57, 58, 63, 65, 67, 69, 71, 79, 81, 83, 85, 87, and 198.

29. The isolated polynucleotide of claim 28, wherein the polynucleotide comprises a sequence selected from the group consisting of SEQ ID NOs: 123, 124, 129, 133, 135, 138, 143, 145, 147, 149, 151, 195, and 196.

30. A vector comprising the polynucleotide of claim 27 or 28.

31. A host cell comprising the vector of claim 30.