Claims

1. An antibody or antigen-binding fragment thereof that specifically binds to CD37, wherein said antibody or fragment thereof comprises the heavy chain variable region (VH) CDR1, CDR2, and CDR3 sequences of SEQ ID NOs: 3-5 and the light chain variable region (VL) CDR1, CDR2, and CDR3 sequences of SEQ ID NOs: 6-8, respectively.

2. The antibody or antigen-binding fragment thereof of claim 1, wherein the antibody or fragment thereof comprises the polypeptide sequences of SEQ ID NOs:9 and/or 10.

3. The antibody or antigen-binding fragment thereof of claim 1 or 2, wherein said antibody or antigen-binding fragment thereof is murine, humanized, chimeric, or human.

4. The antibody or antigen-binding fragment thereof of any one of claims 1-3, which is a full length antibody.

5. The antibody or antigen-binding fragment thereof of any one of claims 1-4, which is an antigen-binding fragment.

6. The antigen-binding fragment of claim 5, wherein said antigen-binding fragment comprises a Fab, Fab', F(ab')2, single chain Fv or scFv, disulfide linked Fv, intrabody, IgGΔCH2, minibody, F(ab')3, tetrabody, triabody, diabody, DVD-Ig, mAb2, (scFv)2, or scFv-Fc.

7. The antibody or antigen-binding fragment thereof of any one of claims 1-6, which binds to a human CD37 with a Kd of about 1.0 nM or better.

8. The antibody or antigen-binding fragment thereof of any one of claims 1-7, wherein the antibody or antigen-binding fragment thereof is detectably labeled.

9. A method of detecting CD37 expression in a sample comprising contacting said sample with the antibody or antigen-binding fragment thereof of any one of claims 1-8.

10. The method of claim 9, wherein CD37 expression is determined by immunohistochemical (IHC) assay.

11. Use of a therapeutically active agent comprising an anti-CD37 antibody or antigen-binding fragment thereof for use in the manufacture of a medicament for increasing the efficacy of cancer therapy in a subject, wherein the medicament is to be administered to the subject, wherein increased expression of CD37 has been detected in a cancerous sample from the subject using the antibody or antigen-binding fragment thereof of any one of claims 1-8.

12. The use of claim 11, wherein the detecting is by immunohistochemistry (IHC).

13. The use of claim 11 or 12, wherein the cancer is a leukemia or a lymphoma.

14. The use of claims 11 or 12, 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).

15. The use of claim 11, wherein said cancer is diffuse large B cell lymphoma.

16. The use of any one of claims 11-15, wherein the therapeutically active agent is an antibody maytansinoid conjugate that comprises a CD37 antibody comprising a heavy chain variable region comprising SEQ ID NO:28 and a light chain variable region comprising SEQ ID NO:29.

17. The use of claim 16, wherein the therapeutically active agent comprises the maytansinoid DM1, the non-cleavable SMCC linker, and wherein the CD37 antibody comprises a full length heavy chain comprising SEQ ID NO:30 and a full length light chain comprising SEQ ID NO:31.