WHAT IS CLAIMED IS:

1. A pharmaceutical formulation for subcutaneous administration of a humanized 2H7 antibody, comprising an antibody at a concentration range of 10mg/ml to 200mg/ml, and 2% to 30% cyclodextrin.

2. The formulation of Claim 1 wherein the cyclodextrin is selected from the group consisting of HP-Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE- cyclodextrin.

3. The formulation of Claim 2 wherein the formulation contains 5% to 30% HP - Beta or HP-Gamma cyclodextrin.

4. The formulation of Claim 3 wherein the formulation is selected from the group consisting of
(a) a formulation containing 5% to 30% HP -Beta cyclodextrin; and
(b) a formulation containing 5% to 20% HP-Gamma cyclodextrin.

5. The formulation of Claim 4 wherein the formulation in (b) further comprises 50 mM to 200 mM arginine succinate.

6. The formulation of Claim 2 wherein the formulation contains 2% to 9% SBE-cyclodextrin.

7. The formulation of Claim 1 wherein the antibody is present at a concentration range selected from the group consisting of
(a) a concentration range of 30 mg/ml to 150 mg/ml; and
(b) a concentration range of 100 mg/ml to 150 mg/ml.

8. The formulation of Claim 3, wherein the formulation is selected from the group consisting of
(a) a formulation comprising a humanized 2H7 antibody at 100 mg/ml and 15% to 30% HP-Beta cyclodextrin;

(b) a formulation comprising a humanized 2H7 antibody at 150 mg/ml and 30% HP-Beta cyclodextrin; and
(c) a formulation comprising a humanized 2H7 antibody at 150 mg/ml and 10% HP-Gamma cyclodextrin.

9. The formulation of Claim 8 wherein the formulation in (c) further comprises 50 mM to 200 mM arginine succinate.

10. The formulation of Claim 9 further comprising 30 mM sodium acetate; 5% trehalose dihydrate; and 0.03% Polysorbate 20, at pH 5.3.

11. The formulation of Claim 9 or 10 wherein the humanized 2H7 antibody comprises antibody variant A, B, C, D, F, G, H or I as shown in Table 1.

12. The formulation of Claim 3 wherein the formulation comprises humanized 2H7 antibody variant A as shown in Table 1 at a concentration range of 100 mg/ml to 150 mg/ml, 15% to 30% HP-Gamma cyclodextrin, and 50 mM to 100 mM arginine succinate.

13. Use of a humanized 2H7 antibody of Table 1 in a pharmaceutical formulation comprising 2% to 30% cyclodextrin, wherein the cyclodextrin is selected from the group consisting of HP- Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE-cyclodextrin, in the manufacture of a medicament for treating a CD20 positive B cell cancer in a patient having the cancer.

14. The use of Claim 13 wherein the CD20 positive B cell cancer is a B cell lymphoma or leukemia.

15. The use of Claim 14 wherein the CD20 positive B cell cancer is selected from the group consisting of non-Hodgkin's lymphoma (NHL), relapsed indolent

NHL and rituximab -refractory indolent NHL, lymphocyte predominant Hodgkin's disease (LPHD), small lymphocytic lymphoma (SLL), and chronic lymphocytic leukemia (CLL).

16. Use of a humanized 2H7 antibody of Table 1 in a pharmaceutical formulation comprising 2% to 30% cyclodextrin, wherein the cyclodextrin is selected from the group consisting of HP-Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE-cyclodextrin, in the manufacture of a medicament for treating an autoimmune disease.

17. The use of Claim 16 wherein the autoimmune disease is selected from the group consisting of rheumatoid arthritis (RA) and juvenile rheumatoid arthritis, including methotrexate (Mtx)- inadequate responders and TNFα- antagonist inadequate responders, systemic lupus erythematosus (SLE) including lupus nephritis, multiple sclerosis (MS), including relapsing remitting multiple sclerosis (RRMS), Wegener's disease, inflammatory bowel disease, ulcerative colitis, idiopathic thrombocytopenic purpura (ITP), thrombotic thrombocytopenic purpura (TTP), autoimmune thrombocytopenia, multiple sclerosis, psoriasis, IgA nephropathy, IgM polyneuropathies, myasthenia gravis, ANCA associated vasculitis, diabetes mellitus, Reynaud's syndrome, Sjogren's syndrome, Neuromyelitis Optica (NMO) and glomerulonephritis.

18. The use of Claim 13 or 16 wherein the humanized 2H7 antibody is variant A, B, C, D or H from Table 1.

19. A method of improving or maintaining solubilization of or minimizing precipitation of a humanized 2H7 antibody in an aqueous subcutaneous formulation upon injection at the injection site of a patient, comprising adding 2% to 30% cyclodextrin, wherein the cyclodextrin is selected from the group consisting of HP-Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE-cyclodextrin, to the aqueous subcutaneous formulation.

20. A method of increasing the bioavailability of a humanized 2H7 antibody to be administered subcutaneously, comprising adding 2% to 30% cyclodextrin, wherein the cyclodextrin is selected from the group consisting of HP-Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE-cyclodextrin, to an aqueous subcutaneous formulation comprising the antibody.

21. The method of Claim 19 or 20 wherein the antibody is a humanized anti-CD20 antibody variant A, B, C, D, F, G, H or I as shown in Table 1.

WHAT IS CLAIMED IS:

1. A pharmaceutical formulation for subcutaneous administration of a humanized 2H7 antibody, comprising an antibody at a concentration range of 10mg/ml to 200mg/ml, and 2% to 30% cyclodextrin.

2. The formulation of Claim 1 wherein the cyclodextrin is selected from the group consisting of HP-Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE- cyclodextrin.

3. The formulation of Claim 2 wherein the formulation contains 5% to 30% HP -Beta or HP-Gamma cyclodextrin.

4. The formulation of Claim 3 wherein the formulation is selected from the group consisting of
(a) a formulation containing 5% to 30% HP -Beta cyclodextrin; and
(b) a formulation containing 5% to 20% HP-Gamma cyclodextrin.

5. The formulation of Claim 4 wherein the formulation in (b) further comprises 50 mM to 200 mM arginine succinate.

6. The formulation of Claim 2 wherein the formulation contains 2% to 9% SBE-cyclodextrin.

7. The formulation of Claim 1 wherein the antibody is present at a concentration range selected from the group consisting of
(a) a concentration range of 30 mg/ml to 150 mg/ml; and
(b) a concentration range of 100 mg/ml to 150 mg/ml.

8. The formulation of Claim 3, wherein the formulation is selected from the group consisting of
(a) a formulation comprising a humanized 2H7 antibody at 100 mg/ml and 15% to 30% HP-Beta cyclodextrin;

(b) a formulation comprising a humanized 2H7 antibody at 150 mg/ml and 30% HP-Beta cyclodextrin; and
(c) a formulation comprising a humanized 2H7 antibody at 150 mg/ml and 10% HP-Gamma cyclodextrin.

9. The formulation of Claim 8 wherein the formulation in (c) further comprises 50 mM to 200 mM arginine succinate.

10. The formulation of Claim 9 further comprising 30 mM sodium acetate; 5% trehalose dihydrate; and 0.03% Polysorbate 20, at pH 5.3.

11. The formulation of Claim 9 or 10 wherein the humanized 2H7 antibody comprises:

the light chain variable domain of SEQ ID NO:1, the heavy chain variable domain of SEQ ID NO:2;

the light chain variable domain of SEQ ID NO:3, the heavy chain variable domain of SEQ ID NO:4;

the light chain variable domain of SEQ ID NO:3, the heavy chain variable domain of SEQ ID NO:5;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:7;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:8;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:10;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:11;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:12;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:13;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:14; or

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:15.

12. The formulation of Claim 3 wherein the formulation comprises humanized 2H7 antibody variant A comprising the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:7 at a concentration range of 100 mg/ml to 150 mg/ml, 15% to 30% HP-Gamma cyclodextrin, and 50 mM to 100 mM arginine succinate.

13. Use of a humanized 2H7 antibody in a pharmaceutical formulation comprising 2% to 30% cyclodextrin,

wherein the humanized 2H7 antibody comprises:

the light chain variable domain of SEQ ID NO:1, the heavy chain variable domain of SEQ ID NO:2;

the light chain variable domain of SEQ ID NO:3, the heavy chain variable domain of SEQ ID NO:4;

the light chain variable domain of SEQ ID NO:3, the heavy chain variable domain of SEQ ID NO:5;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:7;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:8;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:10;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:11;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:12;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:13;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:14; or

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:15, and

wherein the cyclodextrin is selected from the group consisting of HP- Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE-cyclodextrin,

in the manufacture of a medicament for treating a CD20 positive B cell cancer in a patient having the cancer.

14. The use of Claim 13 wherein the CD20 positive B cell cancer is a B cell lymphoma or leukemia.

15. The use of Claim 14 wherein the CD20 positive B cell cancer is selected from the group consisting of non-Hodgkin's lymphoma (NHL), relapsed indolent NHL and rituximab -refractory indolent NHL, lymphocyte predominant Hodgkin's disease (LPHD), small lymphocytic lymphoma (SLL), and chronic lymphocytic leukemia (CLL).

16. Use of a humanized 2H7 antibody in a pharmaceutical formulation comprising 2% to 30% cyclodextrin,

wherein the humanized 2H7 antibody comprises:

the light chain variable domain of SEQ ID NO:1, the heavy chain variable domain of SEQ ID NO:2;

the light chain variable domain of SEQ ID NO:3, the heavy chain variable domain of SEQ ID NO:4;

the light chain variable domain of SEQ ID NO:3, the heavy chain variable domain of SEQ ID NO:5;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:7;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:8;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:10;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:11;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:12;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:13;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:14; or

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:15, and

wherein the cyclodextrin is selected from the group consisting of HP-Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE-cyclodextrin,

in the manufacture of a medicament for treating an autoimmune disease.

17. The use of Claim 16 wherein the autoimmune disease is selected from the group consisting of rheumatoid arthritis (RA) and juvenile rheumatoid arthritis, including methotrexate (Mtx)- inadequate responders and TNFα- antagonist inadequate responders, systemic lupus erythematosus (SLE) including lupus nephritis, multiple sclerosis (MS), including relapsing remitting multiple sclerosis (RRMS), Wegener's disease, inflammatory bowel disease, ulcerative colitis, idiopathic thrombocytopenic purpura (ITP), thrombotic thrombocytopenic purpura (TTP), autoimmune thrombocytopenia, multiple sclerosis, psoriasis, IgA nephropathy, IgM polyneuropathies, myasthenia gravis, ANCA associated vasculitis, diabetes mellitus, Reynaud's syndrome, Sjogren's syndrome, Neuromyelitis Optica (NMO) and glomerulonephritis.

18. The use of Claim 13 or 16 wherein the humanized 2H7 antibody comprises:

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:7;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:8;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:10;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:11; or

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:14.

19. A method of improving or maintaining solubilization of or minimizing precipitation of a humanized 2H7 antibody in an aqueous subcutaneous formulation upon injection at the injection site of a patient, comprising adding 2% to 30% cyclodextrin, wherein the cyclodextrin is selected from the group consisting of HP-Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE-cyclodextrin, to the aqueous subcutaneous formulation.

20. A method of increasing the bioavailability of a humanized 2H7 antibody to be administered subcutaneously, comprising adding 2% to 30% cyclodextrin, wherein the cyclodextrin is selected from the group consisting of HP-Beta cyclodextrin, HP-Gamma cyclodextrin, and SBE-cyclodextrin, to an aqueous subcutaneous formulation comprising the antibody.

21. The method of Claim 19 or 20 wherein the antibody is a humanized anti-CD20 antibody variant comprises:

the light chain variable domain of SEQ ID NO:1, the heavy chain variable domain of SEQ ID NO:2;

the light chain variable domain of SEQ ID NO:3, the heavy chain variable domain of SEQ ID NO:4;

the light chain variable domain of SEQ ID NO:3, the heavy chain variable domain of SEQ ID NO:5;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:7;

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:8;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:10;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:11;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:12;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:13;

the full-length light chain of SEQ ID NO:9 and the full-length heavy chain of SEQ ID NO:14; or

the full-length light chain of SEQ ID NO:6 and the full-length heavy chain of SEQ ID NO:15.