

CLAIMS

1. A pharmaceutical composition comprising:
 - (a) at least 75 mg/ml of an anti-C1q antibody or an antigen-binding fragment thereof;
 - (b) from 5 to 25 mM sodium citrate or sodium succinate;
 - (c) from 3% to 7% trehalose; and
 - (d) from 0.04% to 0.06% polysorbate 20 or polysorbate 80,wherein the pharmaceutical composition is at a pH of 6.4-7.5.
2. The pharmaceutical composition of claim 1, wherein the antibody or antigen-binding fragment thereof comprises a light chain variable domain comprising an HVR-L1 having the amino acid sequence of SEQ ID NO: 5, an HVR-L2 having the amino acid of SEQ ID NO: 6, and an HVR-L3 having the amino acid of SEQ ID NO: 7 and/or a heavy chain variable domain comprising an HVR-H1 having the amino acid sequence of SEQ ID NO: 9, an HVR-H2 having the amino acid of SEQ ID NO: 10, and an HVR-H3 having the amino acid of SEQ ID NO: 11.
3. The pharmaceutical composition of claim 1 or 2, wherein the antibody is a monoclonal antibody, a polyclonal antibody, a recombinant antibody, a humanized antibody, a chimeric antibody, a multispecific antibody, or an antibody derivative thereof, optionally wherein the antibody derivative is a single arm antibody.
4. The pharmaceutical composition of any one of claims 1-3, wherein the antibody or antigen-binding fragment thereof comprises a light chain variable domain comprising an amino acid sequence with at least about 95% homology to the amino acid sequence selected from SEQ ID NO: 4 and 35-38 and wherein the light chain variable domain comprises an HVR-L1 having the amino acid sequence of SEQ ID NO: 5, an HVR-L2 having the amino acid of SEQ ID NO: 6, and an HVR-L3 having the amino acid of SEQ ID NO: 7, optionally wherein the light chain variable domain comprises an amino acid sequence selected from SEQ ID NO: 4 and 35-38.
5. The pharmaceutical composition of any one of claims 1-4, wherein the antibody or an antigen-binding fragment thereof comprises a heavy chain variable domain comprising an amino acid sequence with at least about 95% homology to the amino acid sequence selected from SEQ ID NO: 8 and 31-34 and wherein the heavy chain variable domain comprises an HVR-H1 having

the amino acid sequence of SEQ ID NO: 9, an HVR-H2 having the amino acid of SEQ ID NO: 10, and an HVR-H3 having the amino acid of SEQ ID NO: 11, optionally wherein the heavy chain variable domain comprises an amino acid sequence selected from SEQ ID NO: 8 and 31-34.

6. The pharmaceutical composition of any one of claims 1-5, wherein the antibody is an antibody fragment, optionally wherein the antibody fragment is a Fab fragment, a Fab' fragment, a F(ab')₂ fragment, a Fv fragment, a diabody, or a single chain antibody molecule.

7. The pharmaceutical composition of claim 6, wherein the antibody Fab fragment comprises a heavy chain Fab fragment of SEQ ID NO: 39 and/or a light chain Fab fragment of SEQ ID NO: 40.

8. The pharmaceutical composition of any one of claims 1-7, wherein the pharmaceutical composition comprises at least 100 mg/ml, at least 125 mg/ml, at least 150 mg/ml, at least 175 mg/ml, at least 200 mg/ml, at least 225 mg/ml, or at least 250 mg/ml of the anti-C1q antibody or antigen binding fragment thereof, optionally wherein the pharmaceutical composition comprises from 75 mg/ml to 300 mg/ml, from 100 mg/ml to 300 mg/ml, or from 125 mg/ml to 250 mg/ml of the anti-C1q antibody or antigen binding fragment thereof, further optionally wherein the pharmaceutical composition comprises about 75 mg/ml, about 100 mg/ml, about 125 mg/ml, about 150 mg/ml, about 175 mg/ml, about 200 mg/ml, about 225 mg/ml, or about 250 mg/ml of the anti-C1q antibody or antigen binding fragment thereof.

9. The pharmaceutical composition of any one of claims 1-8, wherein the pharmaceutical composition comprises about 5 mM, about 6 mM, about 7 mM, about 8 mM, about 9 mM, about 10 mM, about 11 mM, about 12 mM, about 13 mM, about 14 mM, about 15 mM, about 16 mM, about 17 mM, about 18 mM, about 19 mM, about 20 mM, about 21 mM, about 22 mM, about 23 mM, about 24 mM, or about 25 mM sodium citrate or sodium succinate.

10. The pharmaceutical composition of any one of claims 1-9, wherein the pharmaceutical composition is hypertonic or isotonic.

11. The pharmaceutical composition of any one of claims 1-10, wherein the pharmaceutical composition comprises about 3%, about 4%, about 5%, about 6%, or about 7% trehalose.

12. The pharmaceutical composition of any one of claims 1-11, wherein the pharmaceutical composition comprises about 0.04%, about 0.05%, or about 0.06% polysorbate 20 or polysorbate 80.

13. The pharmaceutical composition of any one of claims 1-12, wherein the pharmaceutical composition is at a pH of about 6.4, about 6.5, about 6.6, about 6.7, about 6.8, about 6.9, about 7.0, about 7.1, about 7.2, about 7.3, about 7.4, or about 7.5.

14. The pharmaceutical composition of any one of claims 1-13, wherein the pharmaceutical composition further comprises from 30 mM to 50 mM NaCl, optionally wherein the pharmaceutical composition comprises about 30 mM, about 35 mM, about 40 mM, about 45 mM, or about 50 mM NaCl.

15. The pharmaceutical composition of any one of claims 1-14, wherein the viscosity of the pharmaceutical composition is no more than 10 cP at 25°C, optionally wherein the viscosity of the pharmaceutical composition is about 1 cP, about 2 cP, about 3 cP, about 4 cP, about 5 cP, about 6 cP, about 7 cP, about 8 cP, about 9 cP, or about 10 cP at 25°C.

16. The pharmaceutical composition of any one of claims 1-15, wherein the pharmaceutical composition is stable

(a) for at least 1 week, at least 2 weeks, at least 3 weeks, at least 4 weeks, at least 5 weeks, at least 6 weeks, at least 7 weeks, at least 8 weeks, at least 9 weeks, at least 10 weeks, at least 11 weeks, at least 12 weeks, at least 13 weeks, at least 14 weeks, at least 15 weeks, at least 16 weeks at least 17 weeks, at least 18 weeks, at least 19 weeks, at least 20 weeks, at least 21 weeks, at least 22 weeks, at least 23 weeks, or at least 24 weeks, optionally wherein the pharmaceutical composition is stable for at least 1 year, at least 1.5 years, or at least two years; and/or

(b) at a temperature from -20°C to 25°C, preferably at a temperature of about -20°C, about -15°C, about -10°C, about -5°C, about 0°C, about 4°C, about 5°C, about 10°C, about 15°C, about 20°C, or about 25°C; and/or

(c) at a temperature of greater than or equal to 25°C, optionally wherein the pharmaceutical composition is stable at a temperature of between about 25°C to about 40°C, further optionally wherein the pharmaceutical composition stable at a temperature of about 25°C, about 30°C, about 35°C, or about 40°C; and/or

(d) after at least one, at least two, at least three, at least four, or at least five freeze/thaw cycles; and/or

(e) after at least one, at least two, or at least three days of continuous agitation.

17. The pharmaceutical composition of any one of claims 1-16, wherein the pharmaceutical composition is suitable for intravitreal or intraocular injection.

18. The pharmaceutical composition of claim 17, wherein the pharmaceutical composition comprises from 5 mM to 20 mM sodium citrate or sodium succinate, optionally wherein the pharmaceutical composition comprises about 5 mM, about 6 mM, about 7 mM, about 8 mM, about 9 mM, about 10 mM, about 11 mM, about 12 mM, about 13 mM, about 14 mM, about 15 mM, about 16 mM, about 17 mM, about 18 mM, about 19 mM, or about 20 mM sodium citrate or sodium succinate.

19. The pharmaceutical composition of claim 17 or 18, wherein the pharmaceutical composition is contained in a syringe, optionally wherein the syringe has a fill volume of no more than 300 microliter, further optionally wherein the syringe delivers a volume of 25-100 microliter, preferably wherein the syringe and/or the pharmaceutical composition is silicon-free and/or low in particulate level, more preferably wherein the syringe and/or the pharmaceutical composition has less than fifty particles per ml of 10 µm and/or less than five particles per ml of 25 µm particles, optionally wherein the syringe and/or the pharmaceutical composition is compliant with USP<789> limits.

20. The pharmaceutical composition of any one of claims 1-19, wherein the pharmaceutical composition is prepared for subcutaneous injection, optionally wherein the pharmaceutical composition is contained in an injector, autoinjector, or pen, further optionally wherein the injector, autoinjector, or pen has a fill volume of no more than 10 ml.

21. The pharmaceutical composition of any one of claims 1-16, wherein the pharmaceutical composition is prepared for intravenous injection, optionally wherein the pharmaceutical composition is contained in an intravenous solution bag.
22. An injector comprising the pharmaceutical composition of any one of claims 1-16, optionally wherein the injector comprises a delivery volume of no more than 10 ml, more optionally wherein the injector is an automatic reusable fixed dose pen, an automatic reusable variable dose pen, or an automatic disposable fixed dose autoinjector.
23. A prefilled syringe comprising the pharmaceutical composition of any one of claims 1-16, optionally wherein the prefilled syringe comprises a delivery volume of no more than 300 microliters, more optionally wherein the prefilled syringe and/or the pharmaceutical composition is silicon-free and/or low in particulate level, further optionally wherein the prefilled syringe and/or the pharmaceutical composition has less than fifty particles per ml of 10 μm particles and/or less than five particles per ml of 25 μm particles, preferably wherein the prefilled syringe and/or the pharmaceutical composition is compliant with USP<789> limits.
24. The pharmaceutical composition selected from any one of claims 1-21 for use in inhibiting synapse loss in a patient suffering from adverse synapse loss, optionally wherein the patient has suffered synapse loss as a result of a neurodegenerative disorder, central nervous system disorder, or a peripheral nervous system disorder, further optionally wherein the neurodegenerative disorder is Guillain Barre Syndrome (GBS), amyotrophic lateral sclerosis (ALS) or Huntington's Disease (HD), optionally wherein neural progenitors or a neurogenesis enhancer is conjointly administered.
25. The pharmaceutical composition selected from any one of claims 1-21 for use in treating or preventing a disease associated with complement activation in an individual in need of such treatment, wherein the disease associated with complement activation is

(a) a neurodegenerative disorder, optionally wherein the neurodegenerative disorder is Alzheimer's disease, amyotrophic lateral sclerosis (ALS), multiple sclerosis, an ophthalmic disorder, glaucoma, myotonic dystrophy, Guillain-Barre' syndrome (GBS), Myasthenia Gravis,

Bullous Pemphigoid, spinal muscular atrophy, Down syndrome, Parkinson's disease, traumatic brain injury (TBI), epilepsy, or Huntington's disease (HD); or

(b) an inflammatory disease, autoimmune disease, complement-associated eye disease or metabolic disorder, optionally wherein the inflammatory disease, autoimmune disease, complement-associated eye disease or metabolic disorder is selected from diabetes, obesity, rheumatoid arthritis (RA), acute respiratory distress syndrome (ARDS), remote tissue injury after ischemia and reperfusion, complement activation during cardiopulmonary bypass surgery, dermatomyositis, pemphigus, lupus nephritis and resultant glomerulonephritis and vasculitis, cardiopulmonary bypass, cardioplegia-induced coronary endothelial dysfunction, type II membranoproliferative glomerulonephritis, IgA nephropathy, acute renal failure, cryoglobulemia, antiphospholipid syndrome, glaucoma, Chronic open-angle glaucoma, acute closed angle glaucoma, macular degenerative diseases, age-related macular degeneration (AMD), geographic atrophy, choroidal neovascularization (CNV), uveitis, diabetic retinopathy, ischemia-related retinopathy, endophthalmitis, intraocular neovascular disease, diabetic macular edema, pathological myopia, von Hippel-Lindau disease, histoplasmosis of the eye, Neuromyelitis Optica (NMO), Central Retinal Vein Occlusion (CRVO), corneal neovascularization, retinal neovascularization, Leber's hereditary optic neuropathy, optic neuritis, Behcet's retinopathy, ischemic optic neuropathy, retinal vasculitis, ANCA vasculitis, Purtscher retinopathy, Sjogren's dry eye disease, dry AMD, sarcoidosis, temporal arteritis, polyarteritis nodosa, allo-transplantation, hyperacute rejection, hemodialysis, chronic occlusive pulmonary distress syndrome (COPD), asthma, aspiration pneumonia, multiple sclerosis, Multifocal Motor Neuropathy (MMN), Guillain-Barre syndrome, Myasthenia Gravis, Bullous Pemphigoid, or myositis; or

(c) an autoimmune disease selected from Multifocal Motor Neuropathy (MMN), Diabetes mellitus type 1, Hashimoto's thyroiditis, Addison's disease, Coeliac disease, Crohn's disease, pernicious anaemia, Pemphigus vulgaris, vitiligo, autoimmune hemolytic anemias, paraneoplastic syndromes, a vasculitis disease, hypocomplementemic urticarial vasculitis (HUV), polymyalgia rheumatica, temporal arteritis, Wegener's granulomatosis, multiple sclerosis, Guillain-Barre syndrome, Myasthenia Gravis, Bullous Pemphigoid, or myositis; or

(d) a blood disorder selected from cold agglutinin hemolytic anemia (cold agglutinin disease), cold antibody hemolytic anemia, ABO incompatible acute hemolytic reactions, warm agglutinin hemolytic anemia, warm antibody hemolytic anemia, warm autoimmune hemolytic anemia (WAIHA), autoimmune hemolytic anemia (AIHA) autoimmune thrombocytopenia, antiphospholipid syndrome, Evan's syndrome, neonatal alloimmune thrombocytopenia, red blood cell alloimmunization, Felty's syndrome, antibody-mediated thrombocytopenia, heparin-induced thrombocytopenia (HIT), heparin-induced thrombocytopenia and thrombosis (HITT), thrombotic thrombocytopenic purpura (TTP), immune thrombocytopenic purpura (ITP), thrombocytopenia, thrombosis, vasculitis, lupus nephritis, systemic lupus erythematosus (SLE), glomerulonephritis, anti-phospholipid antibody syndrome (APS), an infection, or a drug-induced hematologic disorder.

26. Use of the pharmaceutical composition selected from any one of claims 1-21 in the manufacture of a medicament for treating or preventing

(a) an autoimmune disorder, or an inflammatory disorder, or a neurodegenerative disorder; and/or

(b) a disease associated with complement activation in an individual in need of such treatment.