CLAIMS

What is claimed is:

1. A liquid pharmaceutical formulation, the formulation comprising a monoclonal anti-PD-L1 antibody in a concentration of about 100 g/L to about 150 g/L, histidine acetate in a concentration of about 15 mM to about 25 mM, sucrose in a concentration of about 200 mM to about 280 mM, polysorbate in a concentration of about 0.04% (w/v) to about 0.08% (w/v), methionine in a concentration of about 5 mM to about 15 mM, and pH of about 5.6 to about 6.0, wherein the monoclonal antibody comprises

(a) a light chain variable region comprising:

(1) HVR-L1 comprising the amino acid sequence RASQDVSTAVA (SEQ ID NO: 1);

(2) HVR-L2 comprising the amino acid sequence SASFLYS (SEQ ID NO:2);

(3) HVR-L3 comprising the amino acid sequence QQYLYHPAT (SEQ ID NO:3); and

(b) a heavy chain variable region comprising:

(1) HVR-H1 comprising the amino acid sequence GFTFSDSWIH (SEQ ID NO:4);

(2) HVR-H2 comprising the amino acid sequence AWISPYGGSTYYADSVKG (SEQ ID NO:5);

(3) HVR-H3 comprising the amino acid sequence WPGGFDY (SEQ ID NO:6).

2. The liquid pharmaceutical formulation of claim 1, wherein the monoclonal antibody in the formulation is in a concentration of about 120 g/L to about 130 g/L.

3. The liquid pharmaceutical formulation of claim 1, wherein the monoclonal antibody in the formulation is in a concentration of about 125 g/L.

4. The liquid pharmaceutical formulation of any one of claims 1-3, wherein the histidine acetate is in a concentration of about 17 mM to about 22 mM.

5. The liquid pharmaceutical formulation of any one of claims 1-3, wherein the histidine acetate is in a concentration of about 20 mM.

6. The liquid pharmaceutical formulation of any one of claims 1-5, wherein the sucrose is in a concentration of about 220 mM to about 260 mM.

7. The liquid pharmaceutical formulation of any one of claims 1-5, wherein the sucrose is in a concentration of about 240 mM.

8. The liquid pharmaceutical formulation of any one of claims 1-7, wherein the pH is about 5.8.

9. The liquid pharmaceutical formulation of any one of claims 1-8, wherein the polysorbate in the formulation is polysorbate 20.

10. The liquid pharmaceutical formulation of any one of claims 1-9, wherein the polysorbate is in a concentration of about 0.05% (w/v) to about 0.07% (w/v).

11. The liquid pharmaceutical formulation of any one of claims 1-9, wherein the polysorbate is in a concentration of about 0.06% (w/v).

12. The liquid pharmaceutical formulation of any one of claims 1-11, wherein the methionine is in a concentration of about 10 mM.

13. The liquid pharmaceutical formulation of any one of claims 1-12, wherein the formulation further comprises a hyaluronidase enzyme.

14. The liquid pharmaceutical formulation of claim 13, wherein the hyaluronidase enzyme is recombinant human hyaluronidase (rHuPH20).

15. The liquid pharmaceutical formulation of claim 13 or 14, wherein the hyaluronidase enzyme is in a concentration of about 1000 U/ml to about 3000 U/ml.

16. The liquid pharmaceutical formulation of claim 13 or 14, wherein the hyaluronidase enzyme is in a concentration of about 2000 U/ml.

17. A liquid pharmaceutical formulation, the formulation comprising a monoclonal anti-PD-L1 antibody in a concentration of about 100 g/L to about 150 g/L, histidine acetate in a concentration of about 15 mM to about 25 mM, sucrose in a concentration of about 200 mM to about 280 mM, polysorbate in a concentration of about 0.01% (w/v) to about 0.03% (w/v), and pH of about 5.3 to about 5.7, wherein the monoclonal antibody comprises

(a) a light chain variable region comprising:

(1) HVR-L1 comprising the amino acid sequence RASQDVSTAVA (SEQ ID NO: 1);

(2) HVR-L2 comprising the amino acid sequence SASFLYS (SEQ ID NO:2);

(3) HVR-L3 comprising the amino acid sequence QQYLYHPAT (SEQ ID NO:3); and

(b) a heavy chain variable region comprising:

(1) HVR-H1 comprising the amino acid sequence GFTFSDSWIH (SEQ ID NO:4);

(2) HVR-H2 comprising the amino acid sequence AWISPYGGSTYYADSVKG (SEQ ID NO:5);

(3) HVR-H3 comprising the amino acid sequence WPGGFDY (SEQ ID NO:6).

18. The liquid pharmaceutical formulation of claim 17, wherein the monoclonal antibody in the formulation is in a concentration of about 120 g/L to about 130 g/L.

19. The liquid pharmaceutical formulation of claim 17, wherein the monoclonal antibody in the formulation is in a concentration of about 125 g/L.

20. The liquid pharmaceutical formulation of any one of claims 17-19, wherein the histidine acetate is in a concentration of about 17 mM to about 22 mM.

21. The liquid pharmaceutical formulation of any one of claims 17-19, wherein the histidine acetate is in a concentration of about 20 mM.

22. The liquid pharmaceutical formulation of any one of claims 17-21, wherein the sucrose is in a concentration of about 220 mM to about 260 mM.

23. The liquid pharmaceutical formulation of any one of claims 17-21, wherein the sucrose is in a concentration of about 240 mM.

24. The liquid pharmaceutical formulation of any one of claims 17-23, wherein the pH is about 5.5.

25. The liquid pharmaceutical formulation of any one of claims 17-24, wherein the polysorbate in the formulation is polysorbate 20.

26. The liquid pharmaceutical formulation of any one of claims 17-25, wherein the polysorbate is in a concentration of about 0.02% (w/v).

27. The liquid pharmaceutical formulation of any one of claims 17-26, wherein the formulation is mixed with a hyaluronidase enzyme prior to being administered to a subject.

28. The liquid pharmaceutical formulation of claim 27, wherein the hyaluronidase enzyme is recombinant human hyaluronidase (rHuPH20).

29. The liquid pharmaceutical formulation of claim 27 or 28, wherein the hyaluronidase enzyme concentration in the mixture is about 1000 U/ml to about 3000 U/ml.

30. The liquid pharmaceutical formulation of claim 27 or 28, wherein the hyaluronidase enzyme concentration in the mixture is about 2000 U/ml.

31. The liquid pharmaceutical formulation of any one of claims 1-30, wherein the monoclonal antibody is not subject to prior lyophilization.

32. The liquid pharmaceutical formulation of any one of claims 1-31, wherein the monoclonal antibody is a humanized antibody.

33. The liquid pharmaceutical formulation of any one of claims 1-32, wherein the monoclonal antibody comprises a light chain variable region comprising the amino acid sequence of SEQ ID NO:7, and a heavy chain variable region comprising the amino acid sequence of SEQ ID NO:8.

34. The liquid pharmaceutical formulation of any one of claims 1-33, wherein the monoclonal antibody is a full length antibody.

35. The liquid pharmaceutical formulation of claim 34, wherein the monoclonal antibody is an IgG1 antibody.

36. The liquid pharmaceutical formulation of any one of claims 1-35, wherein the monoclonal antibody comprises a light chain comprising the amino acid sequence of SEQ ID NO:9, and a heavy comprising the amino acid sequence of SEQ ID NO: 10.

37. The liquid pharmaceutical formulation of any one of claims 1-36, wherein the monoclonal antibody is stored in a glass vial or a metal alloy container.

38. The liquid pharmaceutical formulation of claim 37, wherein the metal alloy is 316L stainless steel or hastelloy.

39. The liquid pharmaceutical formulation of any one of claims 1-38, wherein the formulation is stable at 2-8°C for at least 6 months.

40. The liquid pharmaceutical formulation of any one of claims 1-38, wherein the formulation is stable at 2-8°C for at least 12 months.

41. The liquid pharmaceutical formulation of any one of claims 1-38, wherein the formulation is stable at 2-8°C for at least 24 months.

42. The liquid pharmaceutical formulation of any one of claims 39-41, wherein the antibody in the formulation retains at least about 80% of its biological activity after storage.

43. The liquid pharmaceutical formulation of claim 42, wherein the biological activity is measured by antibody binding to PD-L1.

44. The liquid pharmaceutical formulation of any one of claims 1-43, wherein the formulation is sterile.

45. The liquid pharmaceutical formulation of any one of claims 1-44, wherein the formulation is suitable to be administered to a subject.

46. The liquid pharmaceutical formulation of any one of claims 1-45, wherein the formulation is for subcutaneous administration.

47. An article of manufacture comprising a container holding the liquid pharmaceutical formulation of any one of claims 1-46.

48. The article of manufacture of claim 47, wherein the container is a glass vial or a metal alloy container.

49. The article of manufacture of claim 48, wherein the metal alloy is 316L stainless steel or hastelloy.

50. A kit comprising a container holding the liquid pharmaceutical formulation of any one of claims 1-46.

51. A method of treating a disease or disorder in a subject comprising administering an effective amount of the liquid pharmaceutical formulation of any one of claims 1-46 to the subject, wherein the disease or disorder is selected from the group consisting of infection, cancer, and inflammatory disease.

52. The method of claim 51, wherein the disease or disorder is cancer.

53. The method of claim 52, wherein the cancer is selected from the group consisting of non-small cell lung cancer, small cell lung cancer, urothelial carcinoma, and breast cancer.

54. The method of claim 53, wherein the breast cancer is triple negative breast cancer.

55. The method of any one of claims 51-54, wherein the subject is a human.