Claims

We Claim:

1. A formulation, comprising:

a) an aqueous carrier;

b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment that specifically binds to PDGFR-alpha and inhibits growth of cells that express PDGFR-alpha;

c) 4% to 20% (weight/volume) sucrose;

d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and

e) sodium-acetate buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0.

2. A formulation, consisting of:

a) an aqueous carrier;

b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment that specifically binds to PDGFR-alpha and inhibits growth of cells that express PDGFR-alpha;

c) 4% to 20% (weight/volume) sucrose;

d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and

e) sodium-acetate buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0.

3. The formulation of claim 1 or 2, wherein (b) comprises a full length IgG monoclonal antibody.

4. The formulation of any of claims 1-3, wherein said antibody or antibody fragment is present at a concentration of from 20 mg/ml to 50 mg/ml.

5. The formulation of any of claims 1-4, wherein the antibody or antibody fragment is present at a concentration of 20 mg/ml.

6. The formulation of any of claims 1-4, wherein the antibody or antibody fragment is present at a concentration of 50 mg/ml.

7. The formulation of any of claims 1-6, wherein the antibody or antibody fragment comprises a heavy chain polypeptide comprising the amino acid sequence of SEQ ID NO: 1.

8. The formulation of any of claims 1-7, wherein the antibody or antibody fragment comprises a light chain polypeptide comprising the amino acid sequence of SEQ ID NO: 2.

9. The formulation of any of claims 1-8, wherein the antibody or antibody fragment binds to the same epitope as an antibody comprising a heavy chain polypeptide comprising the amino acid sequence of SEQ ID NO: 1 and a light chain polypeptide comprising the amino acid sequence of SEQ ID NO: 2.

10. The formulation of any of claims 1-9, wherein the antibody or antibody fragment comprises

a VH CDR1 having the amino acid sequence of SEQ ID NO: 3;
a VH CDR2 having the amino acid sequence of SEQ ID NO: 4;
a VH CDR3 having the amino acid sequence of SEQ ID NO: 5:
a VL CDR1 having the amino acid sequence of SEQ ID NO: 6;
a VL CDR2 having the amino acid sequence of SEQ ID NO: 7; and
a VL CDR3 having the amino acid sequence of SEQ ID NO: 8.

11. The formulation of any of claims 1-10, wherein the antibody or antibody fragment binds to the same epitope as an antibody comprising

a VH CDR1 having the amino acid sequence of SEQ ID NO: 3;
a VH CDR2 having the amino acid sequence of SEQ ID NO: 4;
a VH CDR3 having the amino acid sequence of SEQ ID NO: 5:
a VL CDR1 having the amino acid sequence of SEQ ID NO: 6;
a VL CDR2 having the amino acid sequence of SEQ ID NO: 7; and
a VL CDR3 having the amino acid sequence of SEQ ID NO: 8.

12. The formulation of any of claims 1-11, comprising 6% (w/v) sucrose.

13. The formulation of any of claims 1-11, comprising 10% (w/v) sucrose.

14. The formulation of any of claims 1-13, comprising 0.05% (w/v) PS80.

15. The formulation of any of claims 1-14, comprising 50 mM sodium-acetate buffer.

16. The formulation of any of claims 1-15, wherein the formulation has a pH of 5.5.

17. The formulation of any of claims 1-16, wherein said antibody or antibody fragment in said formulation has substantially similar reversible self-association (RSA) characteristics at 2-8 °C and 23-27 °C, as determined by analytical ultracentrifugation (AUC).

18. The formulation of any of claims 1-17, wherein RSA of said antibody or antibody fragment in said formulation is undetectable by high-performance size exclusion chromatography (HPSEC) and dynamic light scattering (DLS).

19. The formulation of any of claims 1-18, wherein greater than 95% of said antibody or antibody fragment in said formulation is in a monomeric form, and wherein RSA of said antibody or antibody fragment is undetectable by HPSEC at 2-8 °C when assessed at 10 mg/ml.

20. The formulation of any of claims 1-19, wherein the hydrodynamic radius of said antibody or antibody fragment in said formulation does not differ significantly at 5 °C versus 25 °C, as determined by dynamic light scattering (DLS).

21. The formulation of any of claims 1-20, wherein the formulation is suitable for intravenous administration.

22. The formulation of any of claims 1-21, wherein the aqueous carrier is water.

23. The formulation of any of claims 1-22, wherein the formulation is non-pyrogenic.

24. The formulation of any of claims 1-23, further comprising a preservative to extend shelf-life.

25. The formulation of any of claims 1-24, wherein the formulation is stable at 2-8 °C for at least 2 years as determined by high performance size exclusion chromatography (HPSEC).

26. The formulation of claim 25, wherein purity of said formulation decreases by less than 0.5% per year for at least two years as determined by high performance size exclusion chromatography (HPSEC).

27. The formulation of any of claims 1-26, wherein the formulation is substantially free of histidine.

28. The formulation of any of claims 1-27, wherein the formulation is substantially free of any additional surfactant.

29. The formulation of any of claims 1-28, wherein the formulation is substantially free of any additional saccharide or polyol.

30. The formulation of any of claims 1-29, wherein the formulation is substantially free of any additional salt.

31. The formulation of any of claims 1-30, wherein the formulation is suitable for lyophilization.

32. A formulation, consisting essentially of:

a) sterile water;

b) 20 mg/ml of an antibody or antibody fragment that specifically binds to PDGFR-alpha and inhibits growth of cells that express PDGFR-alpha;

c) 10% (weight/volume) sucrose;

d) 0.05% (weight/volume) polysorbate 80 (PS80); and

e) 50 mM sodium-acetate buffer,

wherein said formulation has a pH of pH 5.5.

33. A formulation, consisting essentially of:

a) sterile water;

b) 50 mg/ml of an antibody or antibody fragment that specifically binds to PDGFR-alpha and inhibits growth of cells that express PDGFR-alpha;

c) 10% (weight/volume) sucrose;

d) 0.05% (weight/volume) polysorbate 80 (PS80); and

e) 50 mM sodium-acetate buffer,

wherein said formulation has a pH of pH 5.5.

34. The formulation of claim 32 or 33, wherein the antibody or antibody fragment comprises a heavy chain polypeptide comprising the amino acid sequence of SEQ ID NO: 1.

35. The formulation of any of claims 32-34, wherein the antibody or antibody fragment comprises a light chain polypeptide comprising the amino acid sequence of SEQ ID NO: 2.

36. The formulation of any of claims 32-35, wherein the antibody or antibody fragment binds to the same epitope as an antibody comprising a heavy chain polypeptide comprising the amino acid sequence of SEQ ID NO: 1 and a light chain polypeptide comprising the amino acid sequence of SEQ ID NO: 2.

37. The formulation of any of claims 32-36, wherein the antibody or antibody fragment comprises

a VH CDR1 having the amino acid sequence of SEQ ID NO: 3;

a VH CDR2 having the amino acid sequence of SEQ ID NO: 4;

a VH CDR3 having the amino acid sequence of SEQ ID NO: 5:

a VL CDR1 having the amino acid sequence of SEQ ID NO: 6;

a VL CDR2 having the amino acid sequence of SEQ ID NO: 7; and

a VL CDR3 having the amino acid sequence of SEQ ID NO: 8.

38. The formulation of any of claims 32-37, wherein the antibody or antibody fragment binds to the same epitope as an antibody comprising

a VH CDR1 having the amino acid sequence of SEQ ID NO: 3;

a VH CDR2 having the amino acid sequence of SEQ ID NO: 4;

a VH CDR3 having the amino acid sequence of SEQ ID NO: 5:

a VL CDR1 having the amino acid sequence of SEQ ID NO: 6;

a VL CDR2 having the amino acid sequence of SEQ ID NO: 7; and

a VL CDR3 having the amino acid sequence of SEQ ID NO: 8.

39. The formulation of any of claims 32-38, wherein said antibody or antibody fragment in said formulation has substantially similar non-reversible self-association (non-RSA) characteristics at 2-8 °C and 23-27 °C, as determined by AUC.

40. The formulation of any of claims 32-39, wherein RSA of said antibody or antibody fragment in said formulation is undetectable by HPSEC at 2-8 °C when assessed at 10 mg/ml.

41. The formulation of any of claims 32-40, wherein greater than 95% of said antibody or antibody fragment in said formulation is in a monomeric form at 2-8 °C.

42. The formulation of any of claims 32-41, wherein the hydrodynamic radius of said antibody or antibody fragment in said formulation does not differ significantly at 5 °C versus 25 °C, as determined by dynamic light scattering (DLS).

43. The formulation of any of claims 32-42, wherein the formulation is suitable for intravenous administration.

44. The formulation of any of claims 32-43, wherein the water is sterile water.

45. The formulation of any of claims 32-44, wherein the formulation is non-pyrogenic.

46. The formulation of any of claims 32-45, wherein the formulation is stable at about 2 to 8 °C for at least 2 years as determined by long term stability studies following ICHQ1A guidelines.

47. The formulation of claim 46, wherein purity of said formulation decreases by less than 0.5% per year for at least two years as determined by high performance size exclusion chromatography (HPSEC).

48. The formulation of any of claims 32-47, wherein the formulation is not suitable for lyophilization.

49. A formulation, comprising:

a) an aqueous carrier;

b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment;

c) 4% to 20% (weight/volume) sucrose;

d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and

e) sodium-acetate buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0, and wherein said antibody or antibody fragment in said formulation has substantially the same non-RSA tendency when evaluated at about 2-8 °C versus at about 23-27 °C.

50. A formulation, comprising:

a) an aqueous carrier;

b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment;

c) 4% to 20% (weight/volume) sucrose;

d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and

e) sodium-acetate buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0, and wherein greater than 95% of said antibody or antibody fragment in said formulation is in non-self-associated, monomeric form at 2-8 °C.

51. A formulation, consisting of:

a) an aqueous carrier;

b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment;

c) 4% to 20% (weight/volume) sucrose;

d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and

e) sodium-acetate buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0, and wherein said antibody or antibody fragment in said formulation has substantially the same non-RSA tendency when evaluated at about 2-8 °C versus at about 23-27 °C.

52. A formulation, consisting of:

a) an aqueous carrier;

b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment;

c) 4% to 20% (weight/volume) sucrose;

d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and

e) sodium-acetate buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0, and wherein greater than 95% of said antibody or antibody fragment in said formulation is in non-self-associated, monomeric form at 2-8 °C.

53. A method of eliminating or reducing reversible self-association (RSA) of an antibody in a formulation, comprising:

providing an initial formulation comprising an antibody or antibody fragment, wherein RSA of said antibody or antibody fragment in said initial formulation is measurable by HPSEC i) at approximately 2-8 °C and/or ii) at a concentration of greater than 4 mg/ml, and which antibody or antibody fragment in said initial formulation contains high molecular weight forms;

adding sucrose to said initial formulation to provide an altered formulation having about 4% to about 20% (weight/volume) sucrose,

wherein RSA of the antibody or antibody fragment in the altered formulation is eliminated or reduced relative to that of the initial formulation, when compared at a given antibody concentration at approximately 2-8 °C.

54. The method of claim 53, further comprising:

assaying hydrodynamic radius of said antibody or antibody fragment in said altered formulation and comparing said hydrodynamic radius to that of said antibody or antibody fragment in said initial formulation, wherein the hydrodynamic radius of said antibody or antibody fragment in said altered formulation is eliminated or reduced relative to that in said initial formulation, when compared at a given antibody concentration at approximately 2-8 °C.

55. The method of claim 54, wherein hydrodynamic radius of said altered formulation is assayed by DLS.

56. The method of any of claims 53-55, further comprising

assaying RSA tendency of said antibody or antibody fragment in said altered formulation using HPSEC, and comparing said RSA tendency to that of said antibody or antibody fragment in said initial formulation, wherein the RSA tendency of said antibody or antibody fragment in said altered formulation is eliminated or reduced relative to that in said initial formulation, when compared at a given antibody concentration at approximately 2-8 °C.

57. The method of any of claims 53-56, further comprising

assaying RSA tendency of said antibody or antibody fragment in said altered formulation at approximately 2-8 °C and at approximately 23-27 °C, and confirming that the antibody or antibody fragment in said altered formulation has substantially similar non-RSA tendency at 2-8 °C and 23-27 °C.

58. The method of claim 57, wherein assaying RSA tendency at approximately 2-8 °C and at approximately 23-27 °C is by AUC.

59. The methods of any of claims 53-58, wherein RSA of said antibody or antibody fragment in said altered formulation is undetectable by HPSEC.

60. The method of any of claims 53-59, wherein the antibody or antibody fragment is present in the initial formulation and in the altered formulation at a concentration of from about 1 mg/ml to about 100 mg/ml.

61. The method of claim 60, wherein the antibody or antibody fragment is present in the initial formulation and in the altered formulation at a concentration of about 20 mg/ml.

62. The method of claim 60, wherein the antibody or antibody fragment is present in the initial formulation and in the altered formulation at a concentration of about 50 mg/ml.

63. The method of claim 60, wherein the antibody or antibody fragment is present in the altered formulation at a concentration of about 20 mg/ml.

64. The method of claim 60, wherein the antibody or antibody fragment is present in the altered formulation at a concentration of about 50 mg/ml.

65. The method of any of claims 53-64, wherein adding sucrose to the initial formulation comprises adding sucrose to achieve a final concentration of sucrose in the altered formulation of about 10% (w/v).

66. A method of eliminating or reducing reversible self-association (RSA) of an antibody in a formulation, comprising

a) providing an initial formulation comprising an antibody or antibody fragment, wherein RSA of said antibody or antibody fragment in said initial formulation is detectable by HPSEC at approximately 2-8 °C when assessed at a concentration of 10 mg/ml;

b) assaying a biophysical property of said antibody or antibody fragment in said initial formulation using one or more assays;

c) adjusting sucrose content of said initial formulation to achieve a final concentration from about 4% to about 20% (w/v) to produce an altered formulation; and

d) assaying a biophysical property of said antibody or antibody fragment in said altered formulation using one or more assays;

wherein RSA of the antibody or antibody fragment in the altered formulation is eliminated relative to that of the initial formulation, when compared at a given antibody concentration at approximately 2-8 °C.

67. The method of claim 66, wherein step (c) is performed more than one time.

68. The method of claim 67, wherein steps (c) and (d) are performed more than one time.

69. The method of any of claims 66-68, wherein steps (b) and (d) comprise evaluating the same biophysical property.

70. The method of claim 69, wherein said biophysical property is a signature chromatographic peak indicative of RSA tendency, as determined by high-performance size exclusion chromatography (HPSEC).

71. The method of claim 70, wherein said signature chromatographic peak is presence of a shoulder in said peak.

72. The method of any of claims 66-71, wherein said biophysical property is evaluated at two different temperatures.

73. The method of any of claims 66-72, wherein said biophysical property is the hydrodynamic radius of the antibody or antibody fragment in said initial formulation and/or said altered formulation, as determined by dynamic light scattering.

74. The method of any of claims 66-73, wherein said biophysical property is hydrodynamic radius, and the method comprises assaying hydrodynamic radius of said antibody or antibody fragment in said altered formulation and comparing said hydrodynamic radius to that of said antibody or antibody fragment in said initial formulation, wherein the hydrodynamic radius of said antibody or antibody fragment in said altered formulation is reduced relative to that in said initial formulation, when compared at a given antibody concentration at approximately 2-8 °C.

75. The method of claim 74, wherein hydrodynamic radius of said altered formulation is assayed by DLS.

76. The method of any of claims 66-75, wherein the antibody or antibody fragment is present in the initial formulation and in the altered formulation at a concentration of from about 1 mg/ml to about 100 mg/ml.

77. The method of claim 76, wherein the antibody or antibody fragment is present in the initial formulation and in the altered formulation at a concentration of about 20 mg/ml.

78. The method of claim 77, wherein the antibody or antibody fragment is present in the initial formulation and in the altered formulation at a concentration of about 50 mg/ml.

79. The method of claim 78, wherein the antibody or antibody fragment is present in the altered formulation at a concentration of about 20 mg/ml.

80. The method of claim 79, wherein the antibody or antibody fragment is present in the altered formulation at a concentration of about 50 mg/ml.

81. The method of any of claims 66-80, wherein adjusting sucrose content comprises adding sucrose to achieve a final concentration of sucrose in the altered formulation of about 10% (w/v).

82. A formulation comprising an antibody or antibody fragment produced according to the methods of any of claims 53-81.

83. A method of treating a neoplastic condition in a patient in need thereof, comprising administering to said patient in need thereof an effective amount of the formulation of any of claims 1-52.

84. The method of claim 83, wherein the formulation is administered as part of a therapeutic regimen in combination with one or more additional agents or treatment modalities.

85. The method of claim 83 or 84, wherein the neoplastic condition is cancer.

86. A method for producing a formulation comprising an antibody or antibody fragment having reduced RSA, the method comprising:

producing an antibody or antibody fragment; and

formulating said antibody or antibody fragment as a formulation comprising:

an aqueous carrier;

1 mg/ml to 100 mg/ml of said antibody or antibody fragment;

4% to 20% (weight/volume) sucrose;

0.01% to 0.1% (weight/volume) surfactant; and

acetate-salt buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0;

wherein the amount of sucrose for use in said formulation was selected by:

providing an initial formulation comprising an antibody or antibody fragment, wherein RSA of said antibody or antibody fragment in said initial formulation was detectable by HPSEC at approximately 2-8 °C, and which antibody or antibody fragment in said initial formulation consists of high molecular weight forms;

adding sucrose to said initial formulation to provide an altered formulation having 4% to 20% (weight/volume) sucrose,

wherein RSA of the antibody or antibody fragment in the altered formulation was reduced relative to the initial formulation, when compared at a given antibody concentration at approximately 2-8 °C.

87. A method for producing a formulation comprising an antibody or antibody fragment having reduced RSA, the method comprising:

producing an antibody or antibody fragment; and

formulating said antibody or antibody fragment as a formulation comprising

an aqueous carrier;

1 mg/ml to 100 mg/ml of said antibody or antibody fragment;

4% to 20% (weight/volume) sucrose;

0.01% to 0.1% (weight/volume) surfactant; and

acetate-salt buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0;

wherein the amount of sucrose for use in said formulation was selected by:

a) providing an initial formulation comprising an antibody or antibody fragment, wherein RSA of said antibody or antibody fragment in said initial formulation was detectable by HPSEC at approximately 2-8 °C when assessed at 10 mg/ml;

b) assaying a biophysical property of said antibody or antibody fragment in said initial formulation using one or more assays;

c) adjusting sucrose content of said initial formulation to achieve a final concentration from about 4% to about 40% (w/v) to produce an altered formulation; and

d) assaying a biophysical property of said antibody or antibody fragment in said altered formulation using one or more assays,

wherein RSA of the antibody or antibody fragment in the altered formulation was reduced relative to that of the initial formulation, when compared at a given antibody concentration at approximately 2-8 °C.

88. The method of claim 86 or 87, the method comprising

producing an antibody or antibody fragment; and

formulating said antibody or antibody fragment as a formulation comprising

an aqueous carrier;

1 mg/ml to 100 mg/ml of said antibody or antibody fragment;

4% to 20% (weight/volume) sucrose;

0.01% to 0.1% (weight/volume) surfactant; and

Sodium-acetate buffer,

wherein said formulation has a pH of pH 4.0 to pH 6.0.

Claims
We claim:

1. A formulation, comprising:
a) an aqueous carrier;
b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment that specifically binds to PDGFR-alpha and inhibits growth of cells that express PDGFR-alpha, wherein said antibody or antibody fragment in said formulation has substantially similar reversible self-association (RSA) characteristics at 2-8° C. and 23-27° C., as determined by analytical ultracentrifugation (AUC);
c) 4% to 20% (weight/volume) sucrose;
d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and
e) sodium-acetate buffer,
wherein said formulation has a pH of pH 4.0 to pH 6.0.

2. The formulation of claim 1, wherein said antibody or antibody fragment is present at a concentration of from 20 mg/ml to 50 mg/ml.

3. The formulation of claim 1, wherein the antibody or antibody fragment comprises
a VH CDR1 having the amino acid sequence of SEQ ID NO: 3;

a VH CDR2 having the amino acid sequence of SEQ ID NO: 4;

a VH CDR3 having the amino acid sequence of SEQ ID NO: 5:

a VL CDR1 having the amino acid sequence of SEQ ID NO: 6;

a VL CDR2 having the amino acid sequence of SEQ ID NO: 7; and

a VL CDR3 having the amino acid sequence of SEQ ID NO: 8.

4. The formulation of claim 1, comprising 10% (w/v) sucrose.

5. The formulation of claim 1, wherein the formulation is substantially free of histidine.

6. The formulation of claim 1, wherein the formulation is substantially free of any additional surfactant.

7. The formulation of claim 1, wherein the formulation is substantially free of any additional saccharide or polyol.

8. A formulation, consisting essentially of:
a) sterile water;
b) 20 mg/ml of an antibody or antibody fragment that specifically binds to PDGFR-alpha and inhibits growth of cells that express PDGFR-alpha;
c) 10% (weight/volume) sucrose;
d) 0.05% (weight/volume) polysorbate 80 (PS80); and
e) 50 mM sodium-acetate buffer,

wherein said formulation has a pH of pH 5.5.

9. The formulation of claim 8, wherein the antibody or antibody fragment comprises
a VH CDR1 having the amino acid sequence of SEQ ID NO: 3;
a VH CDR2 having the amino acid sequence of SEQ ID NO: 4;
a VH CDR3 having the amino acid sequence of SEQ ID NO: 5:
a VL CDR1 having the amino acid sequence of SEQ ID NO: 6;
a VL CDR2 having the amino acid sequence of SEQ ID NO: 7; and
a VL CDR3 having the amino acid sequence of SEQ ID NO: 8.

10. The formulation of claim 8, wherein the formulation is not suitable for lyophilization.

11. A formulation, comprising:
a) an aqueous carrier;
b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment;
c) 4% to 20% (weight/volume) sucrose;
d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and
e) sodium-acetate buffer,
wherein said formulation has a pH of pH 4.0 to pH 6.0, and wherein said antibody or antibody fragment in said formulation has substantially the same non-RSA tendency when evaluated at about 2-8° C. versus at about 23-27° C.

12. A formulation, comprising:
a) an aqueous carrier;
b) 1 mg/ml to 100 mg/ml of an antibody or antibody fragment;
c) 4% to 20% (weight/volume) sucrose;
d) 0.01% to 0.1% (weight/volume) polysorbate 80 (PS80); and
e) sodium-acetate buffer,
wherein said formulation has a pH of pH 4.0 to pH 6.0, and wherein greater than 95% of said antibody or antibody fragment in said formulation is in non-self-associated, monomeric form at 2-8° C.

13. A formulation comprising an antibody or antibody fragment produced according to a method for eliminating or reducing reversible self-association (RSA) of an antibody in a formulation, said method comprising
providing an initial formulation comprising the antibody or antibody fragment, wherein RSA of said antibody or antibody fragment in said initial formulation is measurable by HPSEC (i) at approximately 2-8° C. and/or (ii) at a concentration of greater than 4 mg/ml, and which antibody or antibody fragment in said initial formulation contains high molecular weight forms;
adding sucrose to said initial formulation to provide an altered formulation having about 4% to about 20% (weight/volume) sucrose,
wherein RSA of the antibody or antibody fragment in the altered formulation is eliminated or reduced relative to that of the initial formulation, when compared at a given antibody concentration at approximately 2-8° C.

14. The formulation of claim 1, comprising 6% to 12% (w/v) sucrose.