

What is claimed:

1. A pharmaceutical formulation comprising a recombinant AAV FVIII virus, a buffering agent, an isotonicity agent, a bulking agent and a surfactant.
2. The pharmaceutical formulation of Claim 1, wherein the recombinant AAV FVIII virus is AAV5-FVIII-SQ.
3. The pharmaceutical formulation of Claim 1 or 2 which is stable during storage at $\leq 65^{\circ}\text{C}$ for at least 2 weeks.
4. The pharmaceutical formulation of any one of Claims 1-3, which comprises sodium phosphate, dibasic at a concentration of from about 0.1 mg/ml to about 3 mg/ml, sodium phosphate monobasic monohydrate at a concentration of from about 0.1 mg/ml to about 3 mg/ml, sodium chloride at a concentration of from about 1 mg/ml to about 20 mg/ml, mannitol at a concentration of from about 5 mg/ml to about 40 mg/ml, and poloxamer 188 at a concentration of from about 0.1 mg/ml to about 4 mg/ml.
5. The pharmaceutical formulation of any one of Claims 1-4, which comprises sodium phosphate, dibasic at a concentration of about 1.42 mg/ml, sodium phosphate monobasic monohydrate at a concentration of about 1.38 mg/ml, sodium chloride at a concentration of about 8.18 mg/ml, mannitol at a concentration of about 20 mg/ml, and poloxamer 188 at a concentration of about 2 mg/ml.
6. The pharmaceutical formulation of any one of Claims 1-5 which is liquid.
7. The pharmaceutical formulation of any one of Claims 1-6 which comprises said AAV FVIII virus at a concentration of from about $1\text{E}12$ vg/ml to about $2\text{E}14$ vg/ml.
8. The pharmaceutical formulation of Claim 7 which comprises said AAV FVIII virus at a concentration of about $2\text{E}13$ vg/ml.
9. The pharmaceutical formulation of any one of Claims 1-8 which is useful for IV administration to a patient suffering from hemophilia A.

10. A method of treating a subject suffering from hemophilia A comprising administering to said subject a therapeutically effective amount of a recombinant AAV FVIII virus.
11. The method of Claim 10, wherein said recombinant AAV FVIII virus is AAV5-FVIII-SQ.
12. The method of Claim 10 or 11, wherein said step of administering is by intravenous administration.
13. The method of any one Claims 10-12, wherein said step of administering comprises administering from about 1E12 vg/kg to about 1E14 vg/kg recombinant AAV FVIII virus to said subject.
14. The method of any one of Claims 10-12, wherein said step of administering comprises administering from about 6E12 vg/kg to about 6E13 vg/kg recombinant AAV FVIII virus to said subject.
15. The method of any one of Claims 10-14 which results in expression of at least about 5 IU/dl of functional Factor VIII protein in said subject.
16. The method of any one of Claims 10-16, wherein said subject expresses at least about 5 IU/dl of functional Factor VIII protein 3 weeks or more after said administration.
17. The method of any one of Claims 10-16 which results in an increase in functional FVIII activity of at least about 1 IU/dl in said subject.
18. The method of any one of Claims 10-17, wherein said step of administering comprises administering the pharmaceutical formulation of any one of Claims 1-9.
19. The method of Claim 18, wherein said pharmaceutical formulation comprises sodium phosphate, dibasic at a concentration of from about 0.1 mg/ml to about 3 mg/ml, sodium phosphate monobasic monohydrate at a concentration of from about 0.1 mg/ml to about 3 mg/ml, sodium chloride at a concentration of from about 1 mg/ml to about 20 mg/ml, mannitol at a concentration of from about 5 mg/ml to about 40 mg/ml, and poloxamer 188 at a concentration of from about 0.1 mg/ml to about 4 mg/ml.

20. The method of Claim 18, wherein said pharmaceutical formulation comprises sodium phosphate, dibasic at a concentration of about 1.42 mg/ml, sodium phosphate monobasic monohydrate at a concentration of about 1.38 mg/ml, sodium chloride at a concentration of about 8.18 mg/ml, mannitol at a concentration of about 20 mg/ml, and poloxamer 188 at a concentration of about 2 mg/ml.
21. The method of any one of Claims 10-20, wherein said subject is treated prophylactically with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day.
22. The method of any one of Claims 10-21, wherein said subject is treated prophylactically with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day over a continuous period of at least 3, 4, 5, 6, 7, 8, 9 or 10 weeks or greater.
23. The method of any one of Claims 10-22, wherein said subject is treated therapeutically with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day.
24. The method of any one of Claims 10-23, wherein said subject is treated therapeutically with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day over a continuous period of at least 3, 4, 5, 6, 7, 8, 9 or 10 weeks or greater.
25. The method of any one of Claims 10-24 further comprising the step of determining the absence or presence of anti-AAV capsid antibodies in the serum of said subject after administration of said therapeutically effective amount of said recombinant AAV FVIII virus.
26. The method of Claim 25 further comprising the step of administering an effective amount of a corticosteroid to said subject after a determination of the presence of anti-AAV capsid antibodies in the serum of said subject is made.
27. A method of reducing bleeding time of a bleeding episode in a subject suffering from hemophilia A comprising administering to said subject, prior to said bleeding episode, a therapeutically effective amount of a recombinant AAV FVIII virus.
28. The method of Claim 27, wherein the step of administering occurs at least 3 weeks prior to said bleeding episode.

29. The method of Claim 27 or 28, wherein said recombinant AAV FVIII virus is AAV5-FVIII-SQ.
30. The method of any one of Claims 27-29, wherein said step of administering is by intravenous administration.
31. The method of any one of Claims 27-30, wherein said step of administering comprises administering from about 1E12 vg/kg to about 1E14 vg/kg recombinant AAV FVIII virus to said subject.
32. The method of any one of Claims 27-30, wherein said step of administering comprises administering from about 6E12 vg/kg to about 6E13 vg/kg recombinant AAV FVIII virus to said subject.
33. The method of any one of Claims 27-32 which results in expression of at least about 5 IU/dl of functional Factor VIII protein in said subject.
34. The method of any one of Claims 27-33, wherein said subject expresses at least about 5 IU/dl of functional Factor VIII protein 3 weeks or more after said administration.
35. The method of any one of Claims 27-34 which results in an increase in functional FVIII activity of at least about 1 IU/dl in said subject.
36. The method of any one of Claims 27-35, wherein said step of administering comprises administering the pharmaceutical formulation of any one of Claims 1-9.
37. The method of Claim 36, wherein said pharmaceutical formulation comprises sodium phosphate, dibasic at a concentration of from about 0.1 mg/ml to about 3 mg/ml, sodium phosphate monobasic monohydrate at a concentration of from about 0.1 mg/ml to about 3 mg/ml, sodium chloride at a concentration of from about 1 mg/ml to about 20 mg/ml, mannitol at a concentration of from about 5 mg/ml to about 40 mg/ml, and poloxamer 188 at a concentration of from about 0.1 mg/ml to about 4 mg/ml.
38. The method of Claim 37, wherein said pharmaceutical formulation comprises sodium phosphate, dibasic at a concentration of about 1.42 mg/ml, sodium phosphate monobasic monohydrate at a concentration of about 1.38 mg/ml, sodium chloride at a concentration of about

8.18 mg/ml, mannitol at a concentration of about 20 mg/ml, and poloxamer 188 at a concentration of about 2 mg/ml.

39. The method of any one of Claims 27-38, wherein said subject is treated prophylactically with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day.

40. The method of any one of Claims 27-39, wherein said subject is treated prophylactically with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day over a continuous period of at least 3, 4, 5, 6, 7, 8, 9 or 10 weeks or greater.

41. The method of any one of Claims 27-40, wherein said subject is treated therapeutically with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day.

42. The method of Claim 41, wherein said subject is treated therapeutically with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day over a continuous period of at least 3, 4, 5, 6, 7, 8, 9 or 10 weeks or greater.

43. A method of increasing Factor VIII protein expression in a subject in need thereof comprising administering to said subject a recombinant AAV FVIII virus.

44. The method of Claim 43, wherein said recombinant AAV FVIII virus is AAV5-FVIII-SQ.

45. The method of Claim 43 or 44, wherein said step of administering is by intravenous administration.

46. The method of any one of Claims 43-45, wherein said step of administering comprises administering from about 1E12 vg/kg to about 1E14 vg/kg recombinant AAV FVIII virus to said subject.

47. The method of any one of Claims 43-46, wherein said step of administering comprises administering from about 6E12 vg/kg to about 6E13 vg/kg recombinant AAV FVIII virus to said subject.

48. The method of any one of Claims 43-47 which results in expression of at least about 5 IU/dl of functional Factor VIII protein in said subject.

49. The method of any one of Claims 43-48, wherein said subject expresses at least about 5 IU/dl of functional Factor VIII protein 3 weeks or more after said administration.
50. The method of any one of Claims 43-49 which results in expression of at least about 1 IU/dl of functional Factor VIII protein in said subject.
51. The method of any one of Claims 43-50, wherein said subject expresses at least about 1 IU/dl of functional Factor VIII protein 3 weeks or more after said administration.
52. The method of any one of Claims 43-51 which results in an increase in functional FVIII activity of at least about 1 IU/dl in said subject.
53. The method of any one of Claims 43-52, wherein said step of administering comprises administering the pharmaceutical formulation of any one of Claims 1-9.
54. The method of Claim 53, wherein said pharmaceutical formulation comprises sodium phosphate, dibasic at a concentration of from about 0.1 mg/ml to about 3 mg/ml, sodium phosphate monobasic monohydrate at a concentration of from about 0.1 mg/ml to about 3 mg/ml, sodium chloride at a concentration of from about 1 mg/ml to about 20 mg/ml, mannitol at a concentration of from about 5 mg/ml to about 40 mg/ml, and poloxamer 188 at a concentration of from about 0.1 mg/ml to about 4 mg/ml.
55. The method of Claim 54, wherein said pharmaceutical formulation comprises sodium phosphate, dibasic at a concentration of about 1.42 mg/ml, sodium phosphate monobasic monohydrate at a concentration of about 1.38 mg/ml, sodium chloride at a concentration of about 8.18 mg/ml, mannitol at a concentration of about 20 mg/ml, and poloxamer 188 at a concentration of about 2 mg/ml.
56. The method of any one of Claims 43-55, wherein said subject is treated with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day.
57. The method of Claim 56, wherein the corticosteroid treatment is performed prophylactically.
58. The method of Claim 56 or 57, wherein the corticosteroid treatment is performed therapeutically.

59. The method of any one of Claims 43-58, wherein said subject is treated with a corticosteroid at a concentration ranging from 5 mg/day to 60 mg/day over a continuous period of at least 3, 4, 5, 6, 7, 8, 9 or 10 weeks or greater.

60. The method of any one of Claims 43-59 further comprising a step of determining the absence or presence of anti-AAV capsid antibodies in the serum of said subject after administration of said therapeutically effective amount of said recombinant AAV FVIII virus.

61. The method of Claim 60 further comprising the step of administering an effective amount of a corticosteroid to said subject after a determination of the presence of anti-AAV capsid antibodies in the serum of said subject is made.

62. A method of treating a subject suffering from hemophilia A comprising the steps of (i) determining the absence of anti-AAV capsid antibodies in the serum of said subject, and (ii) administering to said subject a therapeutically effective amount of a recombinant AAV FVIII virus.

63. A method of treating a subject suffering from hemophilia A comprising the steps of (i) administering to said subject a therapeutically effective amount of a recombinant AAV FVIII virus, and (ii) after administration of said therapeutically effective amount of said recombinant AAV FVIII virus, determining the absence or presence of anti-AAV capsid antibodies in the serum of said subject.

64. The method of Claim 63 which further comprises the step of administering an effective amount of a corticosteroid to said subject after a determination of the presence of anti-AAV capsid antibodies in the serum of said subject is made.