What is Claimed is:

1. Use of a recombinant adeno-associated virus (rAAV) vector in the preparation of a medicament for the treatment of hemophilia A in a human, wherein said rAAV vector comprises:

a) a vector genome comprising a nucleic acid variant encoding Factor VIII (FVIII) having a B domain deletion (hFVIII-BDD), wherein the nucleic acid variant has 98% or greater identity to SEQ ID NO:7 and no more than 2 cytosine-guanine dinucleotides (CpGs); and

b) an LK03 capsid encapsidating said vector genome, wherein said LK03 capsid comprises the amino acid sequence of SEQ ID NO: 27;

wherein the dose of rAAV vector to be administered to the human is from $2x10^{11}$ to $9x10^{11}$ vector genomes per kilogram (vg/kg) inclusive.

2. The use of claim 1, wherein the dose of rAAV vector to be administered to the human is $5x10^{11}$ vg/kg.

3. The use according to claim 1, wherein the nucleic acid variant is operably linked to a promoter comprising the sequence of SEQ ID NO: 22.

4. The use of claim 3, wherein said vector genome further comprises an intron, said promoter, a 3' and 5' adeno-associated virus inverted terminal repeat (ITR) flanking the terminus of the nucleic acid variant, and a filler polynucleotide sequence.

5. The use of claim 4, wherein said vector genome comprises a 5' ITR, a 3' ITR, a polyA signal and intron sequences as set forth in SEQ ID NO: 23.

6. The use of claim 5, wherein said vector genome further comprises a Kozak consensus sequence.

7. The use of claim 3, wherein said vector genome comprises 5' to 3': a 5' AAV2 ITR, said promoter, a synthetic intron derived from human elongation factor EF-1 alpha, said nucleic acid variant, a rabbit beta globin polyA signal sequence, and a 3' AAV2 ITR.

8. The use of claim 7, wherein said intron is the intron sequence provided in SEQ ID NO: 23; and said polyadenylation signal is the polyA signal sequence provided in SEQ ID NO: 23.

9. The use of claim 8, wherein the nucleic acid variant has 99.5% or greater identity to SEQ ID NO: 7.

10. The use of claim 2, wherein said vector genome comprises 5' to 3': a 5' AAV2 ITR, a promoter comprising SEQ ID NO: 22, a synthetic intron derived from human elongation factor EF-1 alpha, said nucleic acid variant, a rabbit beta globin polyA signal sequence, and a 3' AAV2 ITR.

11. The use of claim 10, wherein said intron is the intron sequence provided in SEQ ID NO: 23; and said polyadenylation signal is the polyA signal sequence provided in SEQ ID NO: 23.

12. The use of claim 11, wherein the nucleic acid variant has 99.5% or greater identity to SEQ ID NO: 7.

13. The use of any of claims 1-11, wherein the nucleic acid variant comprises the sequence of SEQ ID NO: 7.

14. The use of any of claims 1-12, wherein said variant Factor VIII (FVIII) having a B domain deletion (hFVIII-BDD) comprises an amino acid sequence at least 99% identical to a wild type FVIII sequence with a B domain deletion.

15. The use of any of claims 1-12, wherein said variant FVIII with a B domain deletion comprises a sequence at least 99% identical to SEQ ID NO: 25.

16. The use of claim 15, wherein said nucleic acid variant has 0 CpGs.

17. The use of any of claims 1-16, wherein the rAAV vector is comprised in a pharmaceutical composition.

18. The use of claim 17, wherein the pharmaceutical composition comprises a biologically compatible carrier or excipient.

19. The use of claim 18, wherein said composition further comprises empty capsids.

20. The use of claim 19, wherein said empty capsids are LK03 capsids (SEQ ID NO:27) and wherein the ratio of said empty capsids to said rAAV vector is between 2:1 to 50:1.

21. The use of any of claims 1-17, wherein the rAAV vector is to be delivered to said human intravenously, intraarterially, intramuscularly, subcutaneously, intra-cavity, or by intubation, or via catheter.

22. The use of any of claims 1-17, wherein the variant Factor VIII level plateaues at approximately 9.15% ± 0.53% or 13.50% ± 0.50% of normal Factor VIII.

23. The use of any of claims 1-17, wherein said patient does not undergo a spontaneous bleed within one year of rAAV administration.

24. The use of any of claims 1-17, wherein said patient has mild hemophilia A.

25. The use of any of claims 1-17, wherein said patient has moderate hemophilia A.

26. The use of any of claims 1-17, wherein said patient has severe hemophilia A.

27. The use of any of claims 1-17, wherein said patient prior to rAAV vector administration is receiving on-demand therapy, has a FVIII baseline level of 1-2% of normal A, and has experienced >10 bleeding events over the previous 12 months.

28. The use of any of claims 1-17, wherein an immunosuppressive agent is not added 2-4 days after vector administration.

29. The use of any of claims 1-17, wherein a steroid is not used within 51 weeks of administration.

30. The use of any of claims 1-17, further comprising the use of an immunosuppressive agent.