CLAIMS

1. A human ubiquitin protein ligase E3A (UBE3A) vector comprising:

a nucleic acid having

i) a 5’ inverted terminal repeat (ITR) sequence;

ii) a promoter downstream of the 5’ ITR sequence;

iii) a UBE3A nucleotide sequence encoding a human UBE3A protein isoform 1 consisting of the amino acid sequence of SEQ ID NO: 4, wherein the UBE3A nucleotide sequence is downstream of the promoter, and wherein the UBE3A nucleotide sequence is operably linked to the promoter; and

iv) a 3’ ITR sequence downstream of the UBE3A nucleotide sequence; and

an adeno-associated virus serotype 9 (AAV9) capsid comprising an amino acid sequence of SEQ ID NO: 27;

wherein the nucleic acid is packaged in the AAV9 capsid; and

wherein the nucleic acid does not include a secretion sequence.

2. The vector of claim 1, wherein the 5' and 3’ ITR sequences are independently selected from the group consisting of adeno-associated virus serotype 1 (AAV1) ITRs, serotype 2 (AAV2) ITRs, serotype 3 (AAV3) ITRs, serotype 4 (AAV4) ITRs, and serotype 9 (AAV9) ITRs.

3. The vector of claim 1, wherein the 5' and 3’ ITR sequences are both serotype 2 (AAV2) ITRs.

4. The vector of claim 1, wherein the 5’ and/or 3’ ITR sequences comprise the nucleotide sequence of SEQ ID NO: 22.

5. The vector of claim 1, wherein the promoter is a cytomegalovirus chicken-beta actin hybrid promoter or human ubiquitin ligase C promoter.

6. The vector of claim 1, wherein the UBE3A nucleotide sequence is SEQ ID NO: 25.

7. Use of the human UBE3A vector of claim 1, in the manufacture of a medicament for the treatment of a subject having a UBE3A deficiency, wherein the medicament is suitably formulated for intracranial injection to a neural cell.

8. The use of claim 7, wherein the medicament comprises the human UBE3A vector in an amount of 5 x 10^6 viral genomes per gram (vg/g) brain mass to 2.86 x 10^{12} vg/g of brain mass, from 4 x 10^7 vg/g to about 2.86 x 10^{12} vg/g of brain mass, or from 1 x 10^8 to 2.86 x 10^{12} vg/g of brain mass.

9. The use of claim 7, wherein the medicament is to be administered via bilateral injection.

10. The use of claim 7, wherein the medicament is to be administered via hippocampal injection or intracerebroventricular injection.

11. The use of claim 7, wherein the medicament is to be administered via intracerebroventricular injection (ICV).

12. The use of any one of claims 7-11, wherein the medicament is to be administered via transduction into at least two of hippocampus, auditory cortex, prefrontal cortex, striatum, thalamus, and cerebellum.

13. The use of any one of claims 7-12, wherein the UBE3A deficiency is Angelman Syndrome.

14. The use of claim 13, wherein when the medicament is to be administered via ICV injection, it is intended to restore UBE3A expression to wild type levels in at least two of the hippocampus, auditory cortex, prefrontal cortex, and striatum.

15. The use of claim 13 or claim 14, wherein the medicament is for the treatment of at least one symptom of Angelman Syndrome.

16. The use of claim 15, wherein at least one symptom of Angelman Syndrome comprises learning and memory deficits.