

What is claimed is:

1. A method for treating a human subject diagnosed with mucopolysaccharidosis I (MPS I), comprising delivering to the cerebrospinal fluid of the brain of the human subject a therapeutically effective amount of recombinant human α -L-iduronidase (IDUA) produced by human neuronal cells, wherein the human IDUA is delivered by administration of a recombinant nucleotide expression vector encoding human IDUA, wherein the recombinant nucleotide expression vector is administered at a dose that is dependent on the human subject's brain mass, and wherein the brain mass is determined by brain magnetic resonance imaging (MRI) of the subject's brain.
2. A method for treating a human subject diagnosed with MPS I, comprising delivering to the cerebrospinal fluid of the brain of the human subject a therapeutically effective amount of recombinant human IDUA produced by human glial cells, wherein the human IDUA is delivered by administration of a recombinant nucleotide expression vector encoding human IDUA, wherein the recombinant nucleotide expression vector is administered at a dose that is dependent on the human subject's brain mass, and wherein the brain mass is determined by brain MRI of the subject's brain.
3. The method of claim 1 or 2, wherein the human subject's brain mass is converted from the human subject's brain volume by multiplying the human subject's brain volume in cm^3 by a factor of 1.046 g/cm^3 , wherein the human subject's brain volume is obtained from the human subject's brain MRI.
4. The method of any one of claims 1 to 3, wherein the recombinant nucleotide expression vector is administered at a dose of about $2 \times 10^9 \text{ GC/g}$ brain mass, about $1 \times 10^{10} \text{ GC/g}$ brain mass, or about $5 \times 10^{10} \text{ GC/g}$ brain mass.
5. The method of any one of claims 1 to 4, wherein the recombinant nucleotide expression vector is administered via intracisternal (IC) administration.

6. The method of any one of claims 1 to 4, wherein the recombinant nucleotide expression vector is administered via intracerebroventricular (ICV) administration.

7. The method of any one of claims 1 to 6, wherein the recombinant nucleotide expression vector is administered at a volume that does not exceed 10% of the total cerebrospinal fluid volume of the human subject.

8. The method of any one of claims 1 to 7, further comprising administering an immune suppression therapy to the human subject before or concurrently with the human IDUA treatment and continuing immune suppression therapy thereafter.

9. The method of claim 8, wherein the immune suppression therapy comprises administering a combination of (a) tacrolimus and mycophenolic acid, (b) rapamycin and mycophenolic acid, or (c) tacrolimus, rapamycin, and a corticosteroid such as prednisolone and/or methylprednisolone to the human subject before or concurrently with the human IDUA treatment and continuing thereafter.

10. The method of claim 8 or 9, wherein the immune suppression therapy is withdrawn after 180 days.

11. The method of any one of claims 1 to 10 in which the human IDUA comprises the amino acid sequence of SEQ ID NO. 1.

12. The method of any one of claims 1 to 11, wherein the recombinant nucleotide expression vector is administered at a dose according to the table below:

Brain Mass (in g)		Target	Dose Levels	
Min	Max		Dose 1 Total GC (1.0×10^{10} GC/g brain mass)	Dose 2 Total GC (5×10^{10} GC/g brain mass)
-	700	650	6.5×10^{12}	3.3×10^{13}
701	800	750	7.5×10^{12}	3.8×10^{13}
801	901	850	8.5×10^{12}	4.3×10^{13}
901	1050	975	9.8×10^{12}	4.9×10^{13}

Brain Mass (in g)		Target	Dose Levels	
Min	Max		Dose 1 Total GC $(1.0 \times 10^{10} \text{ GC/g brain mass})$	Dose 2 Total GC $(5 \times 10^{10} \text{ GC/g brain mass})$
1051	1200	1125	1.1×10^{13}	5.0×10^{13}
1201	-	1300	1.3×10^{13}	6.5×10^{13}