What is claimed is:

1. A recombinant human α-galactosidase-A (rhAGA) protein comprising:

a percentage of total N-linked oligosaccharides that are bis-mannose-6-phosphorylated oligosaccharides that is greater than 9%; and

a mole/mole ratio of mannose-6-phosphate to protein that is between 1.8-3.0.

2. The rhAGA protein of claim 1, wherein the rhAGA protein further comprises a percentage of total N-linked oligosaccharides that are monophosphorylated oligosaccharides that is greater than 14.8%.

3. The rhAGA protein of claim 1, wherein the rhAGA protein further comprises a percentage of total N-linked oligosaccharides that are tetrasialylated oligosaccharides that is greater than 4.9%.

4. The rhAGA protein of claim 2, wherein the rhAGA protein further comprises a percentage of total N-linked oligosaccharides that are tetrasialylated oligosaccharides that is greater than 4.9%.

5. The rhAGA protein of claim 2, wherein the rhAGA protein has a percentage of total N-linked oligosaccharides that are monophosphorylated oligosaccharides that is greater than 16%.

6. The rhAGA protein of claim 3, wherein the rhAGA protein has a percentage of total N-linked oligosaccharides that are tetrasialylated oligosaccharides that is greater than 6%.

7. The rhAGA protein of claim 4, wherein the rhAGA protein has a percentage of total N-linked oligosaccharides that are tetrasialylated oligosaccharides that is greater than 6%.

8. A pharmaceutical composition for treating Fabry disease comprising the rhAGA protein of any one of claims 1-7, and a pharmaceutically acceptable carrier.

9. The pharmaceutical composition of claim 8, wherein the composition is formulated for intravenous, intraarterial, intramuscular, intradermal, subcutaneous, or intraperitoneal administration.

10. The pharmaceutical composition of claim 9, wherein the pharmaceutical composition comprises a concentration of rhAGA of 4 mg/mL to 6 mg/mL.

11. The pharmaceutical composition of claim 10, wherein the pharmaceutical composition comprises a concentration of rhAGA of 5 mg/mL.

12. The pharmaceutical composition of claim 8, wherein the pharmaceutical composition is a sterile, lyophilized powder.

13. The pharmaceutical composition of claim 12, wherein the pharmaceutically acceptable carrier is one or more agents selected from the group consisting of: mannitol, sodium phosphate monobasic monohydrate, and sodium phosphate dibasic heptahydrate.

14. The pharmaceutical composition of claim 8, for treating Fabry disease, which is administered to a subject having Fabry disease, comprising a therapeutically effective amount of the rhAGA protein.

15. A recombinant human α-galactosidase-A (rhAGA) protein produced by a method comprising:

(a) providing a Chinese hamster ovary (CHO) cell produced by a method comprising:

(i) providing a CHO DXB11 cell line;

(ii) sequentially culturing the CHO DXB11 cell line in:

a cell culture medium comprising 5% fetal bovine serum for 3 days to 5 days;

a cell culture medium comprising a 2.5% fetal bovine serum for 3 days to 5 days; and

a cell culture medium comprising no animal serum for 5 days to 10 days; and

(iii) generating a single-cell clone from the CHO cell resulting from step (ii), wherein the single-cell clone, when transfected with red fluorescent protein (RFP), would have a transfection efficiency of > 30% RFP positive, has a cell growth doubling time in a serum-free culture medium of < 35 hours, and > 75% culture viability, and further wherein the single-cell clone grows in a protein-free, animal derived component free medium;

(b) stably transfecting the single-cell clone from step (iii) with an expression vector comprising a sequence encoding the rhAGA protein;

(c) selecting a clone that produces rhAGA;

(d) culturing the clone in protein-free, animal derived component free medium; and

(e) harvesting the rhAGA protein from the CHO cell,

wherein the rhAGA protein comprises a percentage of total N-linked oligosaccharides that are bis-mannose-6-phosphorylated oligosaccharides greater than 9%.

16. The rhAGA protein according to claim 15, wherein the sequence encoding the glycoprotein is at least 90% identical to SEQ ID NO: 1.

17. A pharmaceutical composition for treating Fabry disease comprising the rhAGA protein of claim 15 or 16, and a pharmaceutically acceptable carrier.

18. The pharmaceutical composition of claim 17, wherein the composition is formulated for intravenous, intraarterial, intramuscular, intradermal, subcutaneous, or intraperitoneal administration.

19. The pharmaceutical composition of claim 18, wherein the pharmaceutical composition comprises a concentration of 4 mg/mL to 6 mg/mL recombinant human α-galactosidase-A protein.

20. The pharmaceutical composition of claim 19, wherein the pharmaceutical composition comprises a concentration of 5 mg/mL recombinant human α-galactosidase-A protein.

21. The pharmaceutical composition of claim 17, wherein the pharmaceutical composition is a sterile, lyophilized powder.

22. The pharmaceutical composition of claim 17, for treating Fabry disease, which is administered to a subject having Fabry disease, comprising a therapeutically effective amount of the rhAGA protein.