CLAIMS

1. A method of manufacturing a formulated pharmaceutical powder, said method comprising:

a. atomizing an aqueous solution comprising:

i. a thermal stabilizer and 50 to 180 mg/mL of a trap protein and

ii. 0.03 - 0.1% (w/v) polyoxyethylenesorbitan monolaurate; wherein the spray drying occurs at an inlet temperature of 100 °C to 130 °C and an outlet temperature of about 55°C to less than 100 °C, and

b. applying heat to said atomized aqueous solution to form said formulated pharmaceutical powder,

wherein said formulated pharmaceutical powder is not subjected to secondary drying, and the powder comprises spherical particles having a diameter of < 10 μm.

2. The method of claim 1, wherein said thermal stabilizer comprises sucrose or trehalose.

3. The method of claim 1, wherein said thermal stabilizer does not comprise a molecule with a molecular mass greater than 200 g/mol.

4. The method of claim 1, wherein said thermal stabilizer is selected from the group consisting of mannitol, isoleucine, proline, and combinations thereof.

5. The method of claim 1, wherein said thermal stabilizer comprises (i) mannitol and (ii) isoleucine or proline.

6. The method of claim 1, wherein said aqueous solution does not comprise a buffer.

7. The method of claim 1, wherein said aqueous solution further comprises 0.5 mM - 10 mM of a buffer.

8. The method of claim 1 further comprising suspending said formulated pharmaceutical powder in an organic solution comprising a biodegradable polymer; and spray drying said suspension to form a coated formulated pharmaceutical powder, wherein said formulated pharmaceutical powder is not subjected to secondary drying prior to forming said coated formulated pharmaceutical powder.

9. A method of manufacturing a formulated pharmaceutical powder, said method comprising:

a. atomizing an aqueous solution comprising

i. a thermal stabilizer and a trap protein at a molar ratio of less than 300 moles of said thermal stabilizer per mole of said trap protein and an additional excipient; and

ii. 0.03- 0.1% (w/v) polyoxyethylenesorbitan monolaurate; wherein the spray drying occurs at an inlet temperature of 100 °C to 130 °C and an outlet temperature of about 55°C to less than 100 °C, and

b. applying heat to said atomized aqueous solution to form said formulated pharmaceutical powder,

wherein said formulated pharmaceutical powder is not subjected to secondary drying and the powder comprises spherical particles having a diameter of < 10 µm.

10. The method of claim 1 or 9, wherein the moisture content of formulated pharmaceutical powder is from 3% to 6%.

11. The method of claims 1 or 9, wherein the formulated pharmaceutical powder has less than 10% high molecular weight species of the trap protein.

12. The method of claims 1 or 9, wherein the formulated pharmaceutical powder has less than 10% low molecular weight species of the trap protein .

13. The method of claim 11, wherein the formulated pharmaceutical powder has less than 5% high molecular weight species of the trap protein.

14. The method of claim 11, wherein the formulated pharmaceutical powder has less than 5% low molecular weight species of the trap protein.

15. The method of claim 11, wherein the formulated pharmaceutical powder has less than 1% high molecular weight species of the trap protein.

16. The method of claim 11, wherein the formulated pharmaceutical powder has less than 1% low molecular weight species of the trap protein.

17. The method of claim 11, wherein the formulated pharmaceutical powder has less than 0.5% high molecular weight species of the trap protein.

18. The method of claim 11, wherein the formulated pharmaceutical powder has less than 0.5% low molecular weight species of the trap protein.

19. The method of claim 13, wherein the formulated pharmaceutical powder has less than 0.1% high molecular weight species of the trap protein.

20. The method of claim 13, wherein the formulated pharmaceutical powder has less than 0.1% low molecular weight species of the trap protein.