CLAIMS

I/we claim:

1. A composition for stimulating hair growth comprising osteopontin and hyaluronic acid.

2. The composition of claim 1, wherein the hyaluronic acid has an average molecular weight in a range of about 20 KDa to 1350KDa.

3. The composition of claim 1, wherein the hyaluronic acid is cross-linked.

4. The composition of claim 3, wherein the hyaluronic acid has a cross-link density of about 20% or greater.

5. The composition of claim 1, wherein the hyaluronic acid is present in a concentration of 25 mcg/mL or greater.

6. The composition of claim 1, wherein the hyaluronic acid is present in a concentration of about 25 mcg/mL to about 100 mcg/mL.

7. The composition of claim 1, further comprising one or more of serglycin, chondroitin sulfate, fibrin, IGFBP4, and GFP10.

8. The composition of claim 7, wherein the composition comprises one or more of serglycin, chondroitin sulfate, and fibrin.

9. The composition of claim 1, further comprising a hyaluronidase inhibitor.

10. The composition of claim 9, wherein the hyaluronidase inhibitor is selected from high molecular mass poly (styrene-4-sulfonate) (PSS), gossypol, sodium aurothiomalate, fenoprofen, glycerrhizic acid, fatty acids, plant-derived compounds, heparin, and O-sulfated HA (sHA) or combinations thereof.

11. A composition for stimulating hair growth comprising hyaluronic acid and one or more of serglycin, chondroitin sulfate, fibrin, IGFBP4, and GFP10.

12. The composition of claim 11, wherein the hyaluronic acid has an average molecular weight in a range of about 20 KDa to 1350KDa.

13. The composition of claim 10, wherein the hyaluronic acid is cross-linked.

14. The composition of claim 13, wherein the hyaluronic acid has a cross-link density of about 20% or greater.

15. The composition of claim 11, wherein the composition comprises one or more of serglycin, chondroitin sulfate, and fibrin.

16. The composition of claim 11, further comprising osteopontin.

17. The composition of claim 11, further comprising a hyaluronidase inhibitor.

18. The composition of claim 17, wherein the hyaluronidase inhibitor is selected from high molecular mass poly (styrene-4-sulfonate) (PSS), gossypol, sodium aurothiomalate, fenoprofen, glycerrhizic acid, fatty acids, plant-derived compounds, heparin, and O-sulfated HA (sHA) or combinations thereof.

19. A method of stimulating hair growth in a skin of a patient in need thereof, comprising:

administering a composition comprising hyaluronic acid and a CD44-binding ligand to the skin of the patient.

20. The method of claim 19, wherein administering comprises applying the composition to a surface of the skin.

21. The method of claim 19, wherein administering comprises injecting the composition into a dermal layer of the skin.

22. The method of claim 21, wherein the composition is injected about 400 microns to about 2 mm deep into the skin.

23. The method of claim 21, wherein the composition is administered in a plurality of injections in an amount of about 400 injections/cm^2 skin to about 650 injections/cm^2 skin.

24. The method of claim 20, further comprising applying iontophoresis to the skin.

25. The method of claim 20, further comprising applying electroporation to the skin.

26. The method of claim 20, further comprising applying laser ablation to the skin.

27. The method of claim 20, further comprising applying radiofrequency thermal ablation to the skin.

28. The method of claim 20, further comprising applying a microneedle device to the skin.

29. A method of administering a composition for hair growth to a patient in need of treatment for hair loss comprising:

injecting the composition into a skin of the patient,

wherein the composition comprises hyaluronic acid and a CD44-binding ligand.

30. The method of claim 29, wherein the composition is injected via a needle, and wherein the needle is inserted 400 microns to about 2 mm into the skin before injection.

31. The method of claim 30, wherein the needle is a microneedle.

32. The method of claims 19-31 wherein the composition is encased in a liposome comprising hydrogenated phospholipids.

33. A composition for stimulating hair growth comprising two or more of osteopontin, hyaluronic acid, serglycin, chondroitin sulfate, fibrin, IGFBP4, and GFP10.

34. A composition for stimulating hair growth comprising hyaluronic acid in a concentration of about 1 mcg/mL to about 250 mcg/mL.

35. The composition of claim 34, wherein the hyaluronic acid has an average molecular weight in a range of about 4,000 Da to 10,000 Da.

36. The composition of claim 34, wherein the hyaluronic acid has an average molecular weight in a range of about 20 KDa to 1350 KDa.

37. The composition of claim 34, wherein the hyaluronic acid is cross-linked.

38. The composition of claim 37, wherein the hyaluronic acid has a cross-link density of about 20% or greater.

39. The composition of claim 34, wherein the hyaluronic acid is present in a concentration of about 25 mcg/mL to about 250 mcg/mL.

40. The composition of claim 39, wherein the hyaluronic acid is present in a concentration of about 25 mcg/mL to about 100 mcg/mL.

41. The composition of claim 39, wherein the hyaluronic acid is present in a concentration of about 100 mcg/mL to about 250 mcg/mL.

42. The composition of claim 39, wherein the hyaluronic acid has a concentration of about 100 ug/mL or less.

43. A method of stimulating hair growth in a skin of a patient in need thereof, comprising:

administering a composition comprising hyaluronic acid in a concentration of about 1 mcg/mL to about 250 mcg/mL to the skin of the patient.

44. The method of claim 43, wherein administering comprises injecting the composition into a dermal layer of the skin.

45. The method of claim 44, wherein the composition is injected about 400 microns to about 2 mm deep into the skin.

46. The method of claim 44, wherein the composition is administered in a plurality of injections in an amount of about 400 injections/cm^2 skin to about 650 injections/cm^2 skin.

47. The method of claim 43, further comprising applying iontophoresis to the skin.

48. The method of claim 43, further comprising applying electroporation to the skin.

49. The method of claim 43, further comprising applying laser ablation to the skin.

50. The method of claim 43, further comprising applying radiofrequency thermal ablation to the skin.

51. The method of claim 43, further comprising applying a microneedle device to the skin.

52. The method of claim 43, wherein the composition further comprises a CD44-binding ligand.

53. The method of claim 52, wherein the CD44-binding ligand is osteopontin.

54. A method of administering a composition for hair growth to a patient in need of treatment for hair loss comprising:

injecting the composition into a skin of the patient,

wherein the composition comprises hyaluronic acid in a concentration of about 1 mcg/mL to about 250 mcg/mL.

55. The method of claim 54, wherein the composition is injected via a needle, and wherein the needle is inserted 400 microns to about 2 mm into the skin before injection.

56. The method of claim 54, wherein the needle is a microneedle.

57. The method of claim 54, wherein the composition further comprises a CD44-binding ligand.

58. The method of claim 57, wherein the CD44-binding ligand is osteopontin.