The invention claimed is:

1. A topical formulation comprising at least one alpha connexin polypeptide and hydroxyethylcellulose gel, wherein the hydroxyethylcellulose gel stabilizes the alpha connexin polypeptide.

2. The topical formulation of claim 1, wherein the hydroxyethylcellulose gel stabilizes the alpha connexin polypeptide so that after 3 months of storage at 5° C. at least 98% of the alpha connexin polypeptide is detectable by analytical methods.

3. The topical formulation of claim 1, wherein the hydroxyethylcellulose gel stabilizes the alpha connexin polypeptide so that after 3 months of storage at 5° C. at least 95% of the alpha connexin polypeptide is detectable by analytical methods.

4. The topical formulation of claim 1, wherein the hydroxyethylcellulose is present at a concentration of about 1.25% (w/w).

5. The topical formulation of claim 1, wherein the at least one alpha connexin polypeptide is present at a concentration of between about 0.005% (w/w) and about 1.00% (w/w).

6. The topical formulation of claim 1, further comprising a buffering agent.

7. The topical formulation of claim 6, wherein the buffering agent maintains the pH of the topical formulation between about 5 and about 7.

8. The topical formulation of claim 6, wherein the buffering agent is a phosphate buffer.

9. The topical formulation of claim 1, wherein the at least one alpha connexin polypeptide comprises the carboxy-terminal most 4 to 30 contiguous amino acids of an alpha connexin protein or conservative variant thereof.

10. The topical formulation of claim 9, wherein the conservative variant comprises up to two conservative substitutions in the amino acid sequence of the alpha connexin polypeptide.

11. The topical formulation of claim 1, wherein said at least one alpha connexin polypeptide is linked at its amino terminus to a cellular internalization transporter.

12. The topical formulation of claim 11, wherein the cellular internalization transporter is an antennapedia sequence.

13. The topical formulation of claim 1, wherein the at least one alpha connexin polypeptide comprises the amino acid sequence of SEQ ID NO: 9.

14. The topical formulation of claim 1, wherein the alpha connexin polypeptide is connexin 37, connexin 40, connexin 43, or connexin 45.

15. A method of manufacturing a topical formulation comprising:

a) mixing propylene glycol, glycerin, methylparaben and propylparaben until the parabens are completely dissolved;

b) separately mixing purified water, EDTA, monobasic sodium phosphate, dibasic sodium phosphate and D-mannitol until a clear solution is obtained;

c) adding the solution from a) to the solution from b), rinsing the container of the solution from a) with purified water, adding the rinse to the combined solutions, and mixing until the combined solutions are visually homogeneous;

d) with homogenization mixing, adding hydroxyethyl cellulose into the combined solutions of c) and mixing until the polymer is fully dispersed;

e) separately mixing purified water with an alpha connexin polypeptide until the peptide is completely dissolved;

f) adding the solution from e) to the solution of d), rinsing the container of the solution from e) with purified water, adding the rinse to the combined solutions, and mixing until the combined solution are homogeneous.

THE INVENTION CLAIMED IS:

1. A topical formulation comprising at least one alpha connexin polypeptide and hydroxyethylcellulose gel, wherein the hydroxyethylcellulose gel stabilizes the alpha connexin polypeptide and wherein the formulation further comprises a buffering agent that maintains the pH of the topical formulation between about 6 and about 7.

2. The topical formulation of claim 1, wherein the hydroxyethylcellulose gel stabilizes the alpha connexin polypeptide so that after 3 months of storage at 5° C. at least 98% of the alpha connexin polypeptide is detectable by analytical methods.

3. The topical formulation of claim 1, wherein the hydroxyethylcellulose gel stabilizes the alpha connexin polypeptide so that after 3 months of storage at 5° C. at least 95% of the alpha connexin polypeptide is detectable by analytical methods.

4. The topical formulation of claim 1, wherein the hydroxyethylcellulose is present at a concentration of about 1.25% (w/w).

5. The topical formulation of claim 1, wherein the at least one alpha connexin polypeptide is present at a concentration of between about 0.005% (w/w) and about 1.00% (w/w).

6. The topical formulation of claim 1, wherein the buffering agent is a phosphate buffer.

7. The topical formulation of claim 1, wherein the at least one alpha connexin polypeptide comprises the carboxy-terminal most 4 to 30 contiguous amino acids of an alpha connexin protein or conservative variant thereof.

8. The topical formulation of claim 7, wherein the conservative variant comprises up to two conservative substitutions in the amino acid sequence of the alpha connexin polypeptide.

9. The topical formulation of claim 1, wherein said at least one alpha connexin polypeptide is linked at its amino terminus to a cellular internalization transporter.

10. The topical formulation of claim 9, wherein the cellular internalization transporter is an antennapedia sequence.

11. The topical formulation of claim 1, wherein the at least one alpha connexin polypeptide comprises the amino acid sequence of SEQ ID NO: 9.

12. The topical formulation of claim 1, wherein the alpha connexin polypeptide is connexin 37, connexin 40, connexin 43, or connexin 45.

13. A method of manufacturing a topical formulation comprising:

a) mixing propylene glycol, glycerin, methylparaben and propylparaben until the parabens are completely dissolved;

b) separately mixing purified water, EDTA, monobasic sodium phosphate, dibasic sodium phosphate and D-mannitol until a clear solution is obtained;

c) adding the solution from a) to the solution from b), rinsing the container of the solution from a) with purified water, adding the rinse to the combined solutions, and mixing until the combined solutions are visually homogeneous;

d) with homogenization mixing, adding hydroxyethyl cellulose into the combined solutions of c) and mixing until the polymer is fully dispersed;

e) separately mixing purified water with an alpha connexin polypeptide until the peptide is completely dissolved;

f) adding the solution from e) to the solution of d), rinsing the container of the solution from e) with purified water, adding the rinse to the combined solutions, and mixing until the combined solution are homogeneous.