HAIR TREATMENT COMPOSITIONS AND METHODS OF USE

BACKGROUND

The hair growth cycle is made up of three distinct phases (anagen, catagen and telogen). The anagen phase is the growth phase; catagen is the regression/follicle contraction phase; and telogen is the resting/fall out phase. Hair loss may occur when the normal balance between growth phase hair and rest phase is changed and a telogen phase predominates. Disproportional hair loss may lead to the decrease of the total number of the strands of hair. Hair loss may have no specific cause (e.g., syphilitic alopecia). In other cases, hair loss may be caused by physiological stress, surgical trauma, high fever, hemorrhage, changes in thyroidal hormones, reduction of the levels of estrogen after gestation, metabolic or hormonal disturbances, nutritional factors, and medications (e.g., chemotherapy, anti-thyroidal agents, hormones, anticonvulsants, anticoagulants, beta-blockers, inhibitors of angiotensin and lithium conversing enzyme).

Together with the elimination of the cause which triggered the hair loss, treatments of hair loss include stimulation of the follicular metabolism in the form of replacement therapy. The appropriate operation of the cell metabolism increases the resistance of the hair to new external issues and it stimulates the healthy hair growth. Such current treatments often require the use of harsh active pharmaceutical ingredients such as corticosteriods or immune suppressants.

SUMMARY

A hair treatment composition is provided. The hair treatment composition includes a keratin protein composition including a blend of alpha keratin and gamma keratin. The hair treatment may further include at least one peptide. The hair treatment may further include a clover extract such as red clover extract. According to one example, the hair treatment composition includes a complex that includes the keratin protein composition, at least one peptide, and at least one clover extract. According to one example, the hair treatment composition includes a complex that consists of the keratin protein composition, at least one peptide, and at least one clover extract.

The hair treatment compositions provided herein may be formulated as a shampoo, conditioner, spray, foam, scalp care composition, aqueous solution, powder, lotion, hydrogel, oil, emulsion, paste, polish or cream. The hair treatment compositions as provided herein are particularly suited for the uses and methods of treatment described herein including, but not limited to, supporting or promoting an increased percentage of anagen hair, increasing or

otherwise promoting hair density, providing a noticeable improvement of new hair such as by increasing or promoting the percentage of anagen hair, decreasing thinning hair, reducing hair shedding, nourishing the scalp, increasing scalp pH, maintaining scalp microbiome diversity, and improving scalp skin flora ecology.

In a first aspect, there is provided a hair treatment composition comprising:

a keratin protein composition comprising alpha keratin and gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a cosmetic method of increasing anagen hair count comprising the steps of:

administering an effective amount of a first hair treatment composition formulated as a shampoo to a surface of the hair and scalp in need of treatment;

administering an effective amount of a second hair treatment composition formulated as a conditioner to a surface of the hair and scalp in need of treatment; and

administering an effective amount of a third hair treatment composition formulated as a spray to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a use of a first hair treatment composition, a second hair treatment composition and a third hair treatment composition in the manufacture of a medicament for increasing anagen hair count, wherein:

the first hair treatment composition is formulated as a shampoo to be administered to a surface of the hair and scalp in need of treatment;

the second hair treatment composition is formulated as a conditioner to be administered to a surface of the hair and scalp in need of treatment; and

the third hair treatment composition is formulated as a spray to be administered to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a cosmetic method of increasing hair density comprising the steps of:

administering an effective amount of a first hair treatment composition formulated as a shampoo to a surface of the hair and scalp in need of treatment;

administering an effective amount of a second hair treatment composition formulated as a conditioner to a surface of the hair and scalp in need of treatment; and

administering an effective amount of a third hair treatment composition formulated as a spray to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a use of a first hair treatment composition, a second hair treatment composition and a third hair treatment composition in the manufacture of a medicament for increasing hair density, wherein:

the first hair treatment composition is formulated as a shampoo to be administered to a surface of the hair and scalp in need of treatment;

the second hair treatment composition is formulated as a conditioner to be administered to a surface of the hair and scalp in need of treatment; and

the third hair treatment composition is formulated as a spray to be administered to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a cosmetic method of promoting scalp microbiome health in a subject comprising the step of:

administering an effective amount of a hair treatment composition to a surface of the scalp in need of treatment,

wherein the hair treatment composition increases the growth of beneficial microorganisms on the scalp and inhibits the growth of harmful microorganisms on the scalp, and

wherein the hair treatment composition comprises:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a use of a hair treatment composition in the manufacture of a medicament for promoting scalp microbiome health in a subject, wherein:

the hair treatment composition is to be administered to a surface of the scalp in need of treatment,

wherein the hair treatment composition increases the growth of beneficial microorganisms on the scalp and inhibits the growth of harmful microorganisms on the scalp, and

wherein the hair treatment composition comprises:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a cosmetic method of increasing anagen phase hair to telogen phase hair ratio comprising the steps of:

administering an effective amount of a first hair treatment composition formulated as a shampoo to a surface of the hair and scalp in need of treatment;

administering an effective amount of a second hair treatment composition formulated as a conditioner to a surface of the hair and scalp in need of treatment; and

administering an effective amount of a third hair treatment composition formulated as a spray to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a use of a first hair treatment composition, a second hair treatment and a third hair treatment composition in the manufacture of a medicament for increasing anagen phase hair to telogen phase hair ratio, wherein:

the first hair treatment composition is formulated as a shampoo to be administered to a surface of the hair and scalp in need of treatment;

the second hair treatment composition is formulated as a conditioner to be administered to a surface of the hair and scalp in need of treatment; and

the third hair treatment composition is formulated as a spray to be administered to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

In another aspect, there is provided a hair treatment composition comprising:

a keratin protein composition comprising alpha keratin and gamma keratin;

at least one biomimetic signal peptide; and

red clover extract for use in therapy.

BRIEF DESCRIPTION OF THE DRAWINGS

Figure 1A illustrates the baseline anagen hair count (hair count was 138) of an exemplary test subject at initial assessment (T0-D0).

Figure 1B illustrates the anagen hair count (hair count was 216; increase of 78 over baseline) of the same test subject at 120 days (T120).

Figure 1C illustrates the anagen hair count (hair count was 248; increase of 110 over baseline) of the same test subject at 180 days.

Figure 2A provides whole head photographic evidence of hair loss of an exemplary test subject at initial assessment (T0-D0).

Figure 2B provides whole head photographic evidence supporting improved hair growth and density of the same exemplary test subject in Figure 2A at 120 days (T120).

Figure 2C provides whole head photographic evidence supporting improved hair growth and improved hair density of the same exemplary test subject in Figure 2A at 180 days (T180).

Figure 3A provides whole head photographic evidence of hair loss of an exemplary test subject at initial assessment (T0-D0).

Figure 3B provides whole head photographic evidence supproting further improved hair growth and improved hair density of the same exemplary test subject in Figure 3A at 180 days (T180).

DETAILED DESCRIPTION

One or more aspects and embodiments may be incorporated in a different embodiment although not specifically described. That is, all aspects and embodiments can be combined in any way or combination. When referring to the compounds disclosed herein, the following terms have the following meanings unless indicated otherwise. The following definitions are meant to clarify, but not limit, the terms defined. If a particular term used herein is not

specifically defined, such term should not be considered indefinite. Rather, terms are used within their accepted meanings.

CLAIMS

What is claimed is:

1. A hair treatment composition comprising:
a keratin protein composition comprising alpha keratin and gamma keratin;
at least one biomimetic signal peptide; and
red clover extract.

2. The hair treatment composition of claim 1, wherein the keratin protein composition comprises about 95% w/w alpha keratin and about 5% w/w gamma keratin.

3. The hair treatment composition of claim 1, wherein at least about 30% of the alpha keratin exhibits a peak average molecular weight (Mp) of at least about 443kDa.

4. The hair treatment composition of claim 1, wherein the gamma keratin exhibits a peak average molecular weight (Mp) of from at least about 15kDa to about 45kDa.

5. The hair treatment composition of claim 1, wherein the at least one biomimetic signal peptide is selected from the group consisting of acetyl tetrapeptide-3, biotinoyl tripeptide-1, tripeptide-1, acetyl hexapeptide-8, acetyl dipeptide-1, caproyl tetrapeptide-3, carnosine, glutathione, palmitoyl oligopeptide, palmitoyl tetrapeptide-7, acetyl tetrapeptide-5, palmitoyl hexapeptide-14, pentapeptide-3, nonapeptide-1, acetyl hexapeptide, hexapeptide-11, hexanoyl dipeptide-3, acetyl octapeptide-3, palmitoyl tripeptide-5, palmitoyl dipeptide-5, palmitoyl dipeptide-6, acetyl tetrapetide-2, and myristoyl pentapeptide-17.

6. The hair treatment composition of claim 1, further comprising one or more of at least one probiotic, at least one active green tea or green tea extract, at least one rice-based humectant, and panthenol.

7. The hair treatment composition of claim 1, formulated as a shampoo, conditioner, spray, or foam.

8. A cosmetic method of increasing anagen hair count comprising the steps of:
administering an effective amount of a first hair treatment composition formulated as a shampoo to a surface of the hair and scalp in need of treatment;

administering an effective amount of a second hair treatment composition formulated as a conditioner to a surface of the hair and scalp in need of treatment; and

administering an effective amount of a third hair treatment composition formulated as a spray to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

9. Use of a first hair treatment composition, a second hair treatment composition and a third hair treatment composition in the manufacture of a medicament for increasing anagen hair count, wherein:

the first hair treatment composition is formulated as a shampoo to be administered to a surface of the hair and scalp in need of treatment;

the second hair treatment composition is formulated as a conditioner to be administered to a surface of the hair and scalp in need of treatment; and

the third hair treatment composition is formulated as a spray to be administered to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

10. The method of claim 8 or the use of claim 9, wherein the shampoo further comprises sodium hyaluronate, red algae extract, and rice oil glycereth-8 esters.

11. The method of claim 8 or the use of claim 9, wherein the conditioner further comprises acetyl tetrapeptide-3, cyperus esculentus root oil, and at least one probiotic.

12. The method of claim 8 or the use of claim 9, wherein the spray further comprises at least one probiotic, larix/larch europaea wood extract, and methyl nicotinate.

13. The method of claim 8 or the use of claim 9, wherein anagen hair count is increased by at least 15% after 120 days of daily administration of the first, second and third hair treatment composition.

14. The method of claim 8 or the use of claim 9, wherein anagen hair count is increased by at least 25% after 180 days of daily administration of the first, second and third hair treatment composition.

15. A cosmetic method of increasing hair density comprising the steps of:

administering an effective amount of a first hair treatment composition formulated as a shampoo to a surface of the hair and scalp in need of treatment;

administering an effective amount of a second hair treatment composition formulated as a conditioner to a surface of the hair and scalp in need of treatment; and

administering an effective amount of a third hair treatment composition formulated as a spray to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

16. Use of a first hair treatment composition, a second hair treatment composition and a third hair treatment composition in the manufacture of a medicament for increasing hair density, wherein:

the first hair treatment composition is formulated as a shampoo to be administered to a surface of the hair and scalp in need of treatment;

the second hair treatment composition is formulated as a conditioner to be administered to a surface of the hair and scalp in need of treatment; and

the third hair treatment composition is formulated as a spray to be administered to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

17. The method of claim 15 or the use of claim 16, wherein hair density is increased by at least 10% after 120 days of daily administration of the first, second and third hair treatment composition.

18. A cosmetic method of promoting scalp microbiome health in a subject comprising the step of:

administering an effective amount of a hair treatment composition to a surface of the scalp in need of treatment,

wherein the hair treatment composition increases the growth of beneficial microorganisms on the scalp and inhibits the growth of harmful microorganisms on the scalp, and

wherein the hair treatment composition comprises:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

19. Use of a hair treatment composition in the manufacture of a medicament for promoting scalp microbiome health in a subject, wherein:

the hair treatment composition is to be administered to a surface of the scalp in need of treatment,

wherein the hair treatment composition increases the growth of beneficial microorganisms on the scalp and inhibits the growth of harmful microorganisms on the scalp, and

wherein the hair treatment composition comprises:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

20. The method of claim 18 or the use of claim 19, wherein the pH of the scalp is increased by at least about 10% after 28 days of daily administration.

21. A cosmetic method of increasing anagen phase hair to telogen phase hair ratio comprising the steps of:

administering an effective amount of a first hair treatment composition formulated as a shampoo to a surface of the hair and scalp in need of treatment;

administering an effective amount of a second hair treatment composition formulated as a conditioner to a surface of the hair and scalp in need of treatment; and

administering an effective amount of a third hair treatment composition formulated as a spray to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

22. Use of a first hair treatment composition, a second hair treatment and a third hair treatment composition in the manufacture of a medicament for increasing anagen phase hair to telogen phase hair ratio, wherein:

the first hair treatment composition is formulated as a shampoo to be administered to a surface of the hair and scalp in need of treatment;

the second hair treatment composition is formulated as a conditioner to be administered to a surface of the hair and scalp in need of treatment; and

the third hair treatment composition is formulated as a spray to be administered to a surface of the hair and scalp in need of treatment,

wherein each of the first, second, and third hair treatment composition comprise:

a keratin protein composition comprising alpha keratin, gamma keratin;

at least one biomimetic signal peptide; and

red clover extract.

23. The method of claim 21 or the use of claim 22, wherein the hair treatment composition increases the ratio of anagen phase hair to telogen phase hair by at least about 10% after 120 days of daily administration of the first hair treatment composition, second hair treatment composition and third hair treatment composition.

24. The method of claim 21 or the use of claim 22, wherein the hair treatment composition increases the ratio of anagen phase hair to telogen phase hair by at least about 50% after 180

days of daily administration of the first hair treatment composition, second hair treatment composition and third hair treatment composition.

25. A hair treatment composition comprising:
a keratin protein composition comprising alpha keratin and gamma keratin;
at least one biomimetic signal peptide; and
red clover extract for use in therapy.