PLASMINOGEN ACTIVATOR INHIBITOR 1 (PAI-1) INHIBITORS AND USES THEREFOR

Cross-Reference To Related Applications

[0001] This application claims priority to United States Provisional Application No. 62/731,074, filed September 13, 2018, the entirety of which is incorporated herein by reference.

Background

[0002] Graying hair and other dermatological conditions often promote significant anxiety; many people go to great lengths to hide their gray, particularly if it arrives prematurely. Previously available therapies have largely proven unsatisfactory, hence new treatment options are needed.

Summary

[0002a] In an aspect of the present disclosure, there is provided a non-therapeutic cosmetic process of treating or preventing hair graying, the process comprising:
providing a composition that comprises a plasminogen activator inhibitor-1 (PAI-1) inhibitor and:

(i) administering the composition to a site of a subject, wherein the site contains or did contain a plurality of hair follicles, each with a hair disposed therein, so that the PAI-1 inhibitor is delivered to the subject; or

(ii) administering the composition to a subject, wherein a site of the subject contains or did contain a plurality of hair follicles, each with a hair disposed therein, so that the PAI-1 inhibitor is delivered to the subject;
wherein the PAI-1 inhibitor is selected from 5-Chloro-2-{[(2-{[3-(furan-3-yl)phenyl]amino}-2-oxoethoxy)acetyl]amino} benzoic acid, and 5-Chloro-2-{[{[3-(furan-3-yl)phenyl]amino}(oxo)acetyl]amino} benzoic acid.

[0003] The present disclosure provides, *inter alia*, new technologies (e.g., methods, kits, compositions, etc) for treatment and/or prevention of certain dermatological conditions, specifically including graying hair. Among other things, the present disclosure provides an insight that plasminogen activator inhibitor -1 (PAI-1) inhibitors may be useful in the treatment and/or prevention of certain dermatological conditions, for example, in treatment and/or prevention of graying hair.

Claims

We claim:

1. A non-therapeutic cosmetic process of treating or preventing hair graying, the process comprising providing a composition that comprises a plasminogen activator inhibitor-1 (PAI-1) inhibitor and:

(i) administering the composition to a site of a subject, wherein the site contains or did contain a plurality of hair follicles, each with a hair disposed therein, so that the PAI-1 inhibitor is delivered to the subject; or

(ii) administering the composition to a subject, wherein a site of the subject contains or did contain a plurality of hair follicles, each with a hair disposed therein, so that the PAI-1 inhibitor is delivered to the subject;

wherein the PAI-1 inhibitor is selected from 5-Chloro-2-{[(2-{[3-(furan-3-yl)phenyl]amino}-2-oxoethoxy)acetyl]amino} benzoic acid, and 5-Chloro-2-{[{[3-(furan-3-yl)phenyl]amino}(oxo)acetyl]amino} benzoic acid.

2. The process of claim 1, wherein the administering is:

(i) by topically applying to a site on a skin surface, preferably wherein the administering comprises maintaining the composition on the skin surface for a period of time, preferably further comprising, after the period of time, removing remaining composition from the site; preferably wherein the period of time is at least 1 minute; optionally wherein the period of time is within a range of 1 to 10 minutes; or wherein the period of time is at least 1 hour; or

(ii) by injection; or

(iii) by oral administration.

3. The process of claim 2, wherein the administering is (i) by topically applying to a site on a skin surface or (ii) by injection, and wherein the step of administering the composition comprises massaging the composition into the site.

4. The process of any one of the preceding claims, wherein the PAI-1 inhibitor is 5-Chloro-2-{[(2-{[3-(furan-3-yl)phenyl]amino}-2-oxoethoxy)acetyl]amino} benzoic acid.

5. The process of any one of the preceding claims, wherein the composition comprising the PAI-1 inhibitor is or comprises a suspension, or wherein the composition comprising the PAI-1 inhibitor is or comprises a foam, or wherein the composition comprising the PAI-1 inhibitor comprises an emulsion, preferably wherein the emulsion is a nanoemulsion.

6. The process of any one of the preceding claims, wherein the administering is i) by topically applying to a site on a skin surface, further comprising a step of administering a penetrating treatment, preferably wherein the penetrating treatment is or comprises a non-irritating chemical agent, or wherein the penetrating treatment is or comprises administration of an electric or magnetic field, or wherein the penetrating treatment is or comprises microneedling, or wherein the penetrating treatment is or comprises laser treatment.

7. The process of any one of the preceding claims, comprising more than one administration of the composition over time, preferably wherein each administration comprising the PAI-1 inhibitor is separated by a specified period of time.

8. The process of any one of the preceding claims, wherein the administering is by topically applying to a site on a skin surface, and wherein the composition is formulated as a suspension, a foam, a lotion, a cream, a gel, an oil, a powder, a liniment, or drops.

9. The process of any one of the preceding claims, wherein the process further comprises administering one or more other active agents,

wherein the one or more other active agents is selected from the group comprising of cinnamidopropyltrimonium chloride, solid lipid nanoparticles, l-cystine, l-methionine, melatonin, and combinations thereof.