PPAR AGONIST COMPLEX AND METHODS OF USE

CROSS REFERENCE TO RELATED APPLICATIONS

[0001] This application claims the benefit of U.S. Provisional Application No. 62/955,055 filed December 30, 2019, which is hereby incorporated by reference in its entirety.

SUMMARY

[0002] Examples disclosed herein are directed to compositions comprising a combination of three or more PPAR agonists. Examples disclosed herein are directed to compositions comprising an effective amount of three or more PPAR agonists selected from the group consisting of glyceryl linoleate, glyceryl linolenate, xymenynic acid, and *Pterocarpus Marsupium* bark extract.

[0003] Examples disclosed herein are directed to compositions comprising an effective amount of the following PPAR agonists: glyceryl linoleate, glyceryl linolenate, xymenynic acid, and *Pterocarpus Marsupium* bark extract.

[0003a] In one aspect, the present disclosure refers to a composition comprising: 75% to 94% by weight of glyceryl linoleate, 5% to 10% by weight of glyceryl linolenate, 5% to 10% by weight of xymenynic acid, and 1% to 5% by weight of *Pterocarpus Marsupium* bark extract.

[0004] Examples disclosed herein are directed to a topical formulation comprising a composition having an effective amount of three or more PPAR agonists selected from the group consisting of glyceryl linoleate, glyceryl linolenate, xymenynic acid, and *Pterocarpus Marsupium* bark extract, and pharmaceutically or cosmetically acceptable excipients, wherein the topical formulation is suitable for topical administration.

[0004a] In one aspect, the present disclosure refers to a topical formulation comprising the composition disclosed herein and one or more pharmaceutically or cosmetically acceptable excipients, wherein the composition comprises 0.5% to 5% by weight of the formulation and wherein the formulation is suitable for topical administration.

[0005] Examples disclosed herein are directed to a topical formulation comprising a composition having an effective amount of the following PPAR agonists: glyceryl linoleate, glyceryl linolenate, xymenynic acid, and *Pterocarpus Marsupium* bark extract, and pharmaceutically or cosmetically acceptable excipients, wherein the topical formulation is suitable for topical administration.

[0006] Examples disclosed herein are directed to methods of inducing skin barrier repair comprising topically administering a topical formulation comprising a composition having an effective amount of three or more PPAR agonists selected from the group consisting of glyceryl linoleate, glyceryl linolenate, xymenynic acid, and *Pterocarpus Marsupium* bark extract, and pharmaceutically or cosmetically acceptable excipients, wherein the topical formulation is suitable for topical administration. Examples disclosed herein are directed to methods of inducing skin barrier repair comprising topically administering a topical formulation comprising a composition having an effective amount of the following PPAR agonists: glyceryl linoleate, glyceryl linolenate, xymenynic acid, and *Pterocarpus*

Marsupium bark extract, and pharmaceutically or cosmetically acceptable excipients, wherein the topical formulation is suitable for topical administration. In examples, inducing skin barrier repair results in the biosynthesis of barrier lipids and proteins in the skin selected from the group consisting of ceramides, filaggrin, trans-glutaminase 1, TGFB1, keratins, LCE1D, CERS3, CDH1, FOXO1, HSP27, involucrin, loricrin, beta-glucocerebrosidase, aquaporin 3, ABCA12, ADRP, FIAF, and combinations thereof. In examples, inducing skin barrier repair results in the modulation of the expression of barrier genes in the skin selected from the group consisting of ceramides, filaggrin, trans-glutaminase 1, TGFB1, keratins, LCE1D, CERS3, CDH1, FOXO1, HSP27, involucrin, loricrin, beta-glucocerebrosidase, aquaporin 3, ABCA12, ADRP, FIAF, and combinations thereof.

[0006a] In one aspect, the present disclosure refers to a cosmetic method for inducing skin barrier repair in a subject, the method comprising topically administering a topical formulation disclosed herein to the subject.

[0006b] In one aspect, the present disclosure refers to a cosmetic method for improving aging skin in a subject, the method comprising topically administering a topical formulation disclosed herein to the subject.

[0006c] In one aspect, the present disclosure refers to a cosmetic method for improving the look of skin in a subject, the method comprising topically administering a topical formulation disclosed herein to the subject.

[0006d] In one aspect, the present disclosure refers to a cosmetic method for improving skin brightening in a subject, the method comprising topically administering a topical formulation disclosed herein to the subject.

[0006e] In one aspect, the present disclosure refers to a cosmetic method for maintaining healthy hair in a subject, the method comprising topically administering a topical formulation disclosed herein to the subject.

[0006f] In one aspect, the present disclosure refers to a cosmetic method for improving the look and feel of hair in a subject, the method comprising topically administering a topical formulation disclosed herein to the subject.

BRIEF DESCRIPTION OF THE DRAWINGS

[0007] For a fuller understanding of the nature and advantages of the present embodiments, reference should be made to the following detailed description taken in connection with the accompanying drawings, in which:

[0008] FIG. 1 presents percent of control of each test material at 250μg/mL Dilution in the PPAR-α luciferase experiment.

[0009] FIG. 2 presents percent of control of each test material at 500μg/mL Dilution in the PPAR-α luciferase experiment.

[0010] FIG.3 presents percent of control of each test material at 50μg/mL Dilution in the PPAR- γ luciferase experiment.

[0011] FIG. 4 presents percent of control of each test material at 200μg/mL Dilution in the PPAR- γ luciferase experiment.

[0012] FIG. 5 demonstrates test material at 100μg/mL inhibits melanogenesis.

[0013] FIG. 6 demonstrates an increase in ceramide expression at day 1 in delipidated explants.

[0014] FIG. 7 demonstrates an increase in Transglutaminase-1 (TGM1) expression at day 1 in un-delipidated explants.

[0015] FIG. 8 demonstrates an increase in filaggrin expression at day 1 in delipidated explants.

[0016] FIG. 9 shows the effect of the comparative blends on the transcription of the PPAR-α controlled luciferase reporter gene.