PIGMENTATION

EVALUATION OF A POTENT SKIN WHITENING AGENT

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Introduction: Melanin in human skin is synthesized by the conversion of tyrosinase by the enzyme tyrosinase. UP302 (1-(2,4-dihydroxyphenyl) - 3 - (2,4-dimethoxy-3-methylphenyl) propane, Unigen) is shown to inhibit tyrosinase and therefore act as an effective whitening agent.

Objective: To investigate the effects of a potent tyrosinase inhibitor on human skin melanin formation.

Methods: UP302 efficacy was explored through: (1) tyrosinase enzyme inhibition, (2) melanin production in the B16-F10 melanoma cell line, (3) changes in pigmentation measured spectrophotometrically in melanocyte-containing reconstructed skin models, and (4) skin whitening efficacy through a clinical whitening study.

Results: UP302 efficacy was compared to that of various doses Kojic acid, an industry-standard control. After 20 minutes, a dose-dependent decrease in tyrosinase activity was observed with 12.5, 50, and 100 µg/mL UP302 through direct inhibition. In cell culture, a significant dose-dependent decrease in tyrosinase was observed after treatment with 5, 10 and 15 µg/mL UP302. After 48 hours, we detected a decrease in melanin content in B16-F10 cells in vitro at 15 µg/mL. After 7 days, skin models showed a dose-dependent decrease in absorbance (2000 µg/mL versus 4000 µg/mL). Histologically, through Fontana Mason and tyrosinase staining, a decrease in the presence of melanin and tyrosinase, respectively, was observed. Using a clinical whitening test, we measured Skin Lightening Factor after 3 and 4 weeks of treatment with two concentrations of UP302 (1250 µg/mL versus 1500 µg/mL). Compared to Kojic Acid, the whitening index values of participants treated with UP302 were higher.

Conclusion: UP302, a plant-derived tyrosinase inhibitor, has previously been shown to inhibit tyrosinase activity. We assessed the ability of UP302 to reduce pigmentation using both in vitro and in vivo methods. Dose-dependent decrease in melanin in cell and tissue culture indicated a decrease in tyrosinase activity and pigmentation. Clinical testing demonstrated that UP302 formulas outperformed Kojic Acid, at the industry-standard

concentration.