Gene Expression Testing of Floraesters K-20W® Jojoba

What: Floraesters® K-20W Jojoba [INCI: Hydrolyzed Jojoba Esters (and) Water (Aqua)] is a multifunctional, film forming ingredient used in a variety of skin and hair care products.

Purpose: To understand how topical materials influence gene expression in the skin. The study was conducted on 5% Floraesters K-20W Jojoba in glycerin\(^1\) using a full-thickness (epidermis + dermis) in \textit{vitro} culture model (EFT-400, MatTek).

Results: 5% Floraesters K-20W Jojoba delivers statistically significant change (\textit{i.e.} up or down-regulation) in gene expression over the vehicle (glycerin) for the following genes and associated biological functions in the skin:

### Increased Skin Hydration

\(\uparrow\) AQP3 / \(\uparrow\) AQP5 suggests an increase in skin hydration

\textbf{Application to skin care}: These genes help facilitate water and/or glycerol past the epidermal barrier, which in turn increases skin hydration.

### Reduced Proliferation

\(\uparrow\) MKI67 is in agreement with anti-aging literature

\textbf{Application to skin care}: An increase in MKI67 is an indicator of cell proliferation up-regulation during wound healing. A decrease in this gene means lower cell proliferation, and decreased expression has been associated with anti-aging.

### Reduced Inflammatory Response

\(\uparrow\) TNF suggests a reduction in inflammatory response

\textbf{Application to skin care}: Inflammation, barrier disruption, and a lack of skin hydration triggers up-regulation of TNF. A decrease in this gene can indicate a reduction in inflammation and barrier disruption, and an increase in skin hydration.

### Increased Desquamation

\(\uparrow\) KLK5 / \(\uparrow\) KLK6 / \(\uparrow\) KLK7 suggests an increase in stratum corneum shedding and keratinocyte turnover

\textbf{Application to skin care}: An increase in these genes can indicate an increase in stratum corneum shedding and keratinocyte turnover, which in turn can result in a decrease in age spots and brighter looking skin.

### Increased Antioxidant Response

\(\uparrow\) TXN / \(\uparrow\) TXNRD1 / \(\uparrow\) CAT suggests an increase in antioxidant response

\textbf{Application to skin care}: The TXN genes allow the skin to adapt to oxidative stress, and the CAT gene protects the skin as a response to UV and reactive oxygen species (ROS). An increase in these genes allows the skin to better adapt to oxidative stress, resulting in less skin damage.

### Decreased Pigmentation / Increased Brightening

\(\uparrow\) EDN1 suggests a reduction in pigmentation / brightening effects

\textbf{Application to skin care}: UV exposure stimulates EDN1, which in turn stimulates the production of melanin resulting in increased pigmentation. Increased skin pigmentation can result in age spots.

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1. Gene-expression testing of Floraesters K-20W Jojoba was conducted by Genemarkers, LLC (Kalamazoo, MI). Final report available upon request.

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