Anti-inflammatory, Anti-Aging and Anti-Bacterial Properties of SIG1273: A Skin Protecting Cosmetic Functional Ingredient

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Abstract

Background: The skin is the first line of defense against exposure to microbial, physical, environmental and chemical insults. In mobilizing a protective response, several different cell types located in our skin release and respond to pro-inflammatory cytokines ensuring skin homeostasis and health. However, chronic activation of this response, eventually causes damage resulting in premature aging. Tetramethylhexadecenyl Succinoyl Cysteine (SIG1273), an isoprenylcysteine small molecule down regulates these inflammatory signaling pathways in various cell types and possesses anti-bacterial properties.

Methods: NHEKs, were exposed to chemical irritant phorbol 12-myrisate 13-acetate (TPA) or Ultraviolet-B light (UVB) to induce pro-inflammatory cytokine (IL-6, IL-8 and TNF-α) production. T-Cell receptor (TCR) activation of PBMCs and nickel treatments of HDMECs were performed resulting in IL-4, IL-6, IL-8 and IL-17 production. Streptococcus pyogenes were cultured to determine minimal inhibitory concentration (MIC) values.

Results: In vitro studies demonstrate SIG1273 blocks TPA and UVB-induced cytokine production in cultured keratinocytes. Similarly, SIG1273 inhibits overproduction of IL-4 and IL-17 in T-cell Receptor (TCR)-activated PBMCs as well as nickel induction of IL-6 and IL-8 in HDMECs.

Conclusions: SIG1273 represents a novel cosmetic functional ingredient that provides a broad spectrum of benefits for the skin.

Summary/Conclusions

SIG1273 inhibits pro-inflammatory cytokine secretion in response to UVB, TPA and nickel at the T-cell receptor suggesting inhibition at different skin-related cell types by modulating both acute and chronic inflammation signaling.

SIG1273 has antimicrobial action and potency against skin bacteria (S. pyogenes and P. acnes) similar to doxycycline.

SIG1273 was shown to inhibit collagenase (MMP-1) secretion in response to UVA, suggesting ECM remodeling protection and anti-aging benefits.

SIG1273 is a novel anti-inflammatory, anti-aging, anti-microbial cosmetic functional ingredient.