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Efficacy of Non-proteinogenic Amino Acid on Collagen Production and Stability

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Non-natural, non-proteinogenic amino acids are relatively novel in the cosmetic industry. They do not become incorporated into proteins during new protein synthesis, and therefore, topical application of these molecules can lead to skin benefits. We previously showed that a novel proprietary non-proteinogenic amino acid active has significant effect on inducing epidermal turnover and hyaluronic acid production leading to clinically measured benefit on skin. To further evaluate efficacy of this ingredient, in vitro and in vivo effect on collagen production was assessed.

In vitro treatment of 3D tissue skin equivalents led to increase in pro-collagen I production. Additionally, gene expression analysis of the treated 3D tissues revealed increase expression of collagen synthesis and decrease in matrix metalloproteinases genes responsible for collagen degradation.

In vivo, treatments were evaluated in human volunteer forearms. After the treatment, biopsy samples were obtained and analyzed by histology for total collagen production as well as ratio of collagen III/I via Herovici staining. Samples were also collected non-invasively via D-squame tapes and analyzed for HSP-70 protein. HSP-70 is known to protect collagen from degradation and it was shown by us to correlate with age and wrinkle perception. Histological analysis showed increase in collagen as well as increase in collagen III/I ratio. In addition increase in collagen protecting HSP-70 was observed in skin samples.

Taken together, we showed that the novel non-proteinogenic amino acids can increase collagen production and stability, which leads to improvement in skin appearance.

Biography:

Jolanta Idkowiak-Baldys has completed her PhD in Biology from Utah State University and postdoctoral studies from Medical University of South Carolina. Currently, she is a Research Fellow at Avon Products Inc Global Innovation Center where she leads Bioefficacy research group. She has published in multiple peer-reviewed journals and holds several industry patents. She has a strong expertise in skin biology, especially in the area of aging, acne, and skin disorders.

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