



GLOBAL SKIN HEALTH

COUNTERVAILING EFFECTS OF AGE AND NIACINAMIDE ON SKIN BARRIER SURFACE BIOMARKERS

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Introduction: Skin serves as the primary line of defense for protecting from environmental challenges such as UV radiation, relative humidity changes, chemical insult exposure. A health skin barrier as defined by an intact stratum corneum plays a critical role in ensuring this defense property of skin is maximized. Changes in barrier integrity is associated with heightened inflammation and oxidative stress, ultimately contributing to accelerated skin aging. Skin undergoes dramatic changes with photoaging. We evaluated the impact of niacinamide on improving the skin surface barrier via various clinical and visual metrics including TEWL, Confocal Raman spectroscopy, and tape strip biomarker analyses. These findings were further compared with differences in these measures across age groups.

Objective: Evaluate the impact of niacinamide on skin barrier integrity and comparing to key skin barrier surface biomarkers associated with aging from a China Decade Longitudinal Study (CDL).

Materials and Methods: Tape strip samples from two clinical studies were provided: 1) non-treatment CDL samples from 194 Asian subjects (19 to 76 years old), 2) skin barrier study samples from 156 Caucasian females (ages 30-55). We quantified 81 skin surface proteins using a panel of targeted mass spectrometry assays and compared the results between the two studies.

Results: Niacinamide significantly improved skin barrier integrity and impacted numerous skin surface/stratum corneum proteins collected via tape strips. In the CDL, several proteins including calprotectin, calmodulin-like protein 5, and serpin B4 were found to strongly decline with age. Higher levels of these proteins were detected in stratum corneum treated with niacinamide.

Conclusions: Niacinamide improves skin barrier integrity and overall skin homeostasis. Dozens of proteins connected with epidermal homeostasis were affected by niacinamide





treatment in an inverse direction to changes occurring with age. This supports the potential linkage between skin barrier integrity, aging, and the impact of niacinamide on skin homeostasis.

