ABSTRACT BOOK ABSTRACTS



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AESTHETIC AND COSMETIC DERMATOLOGY (LASERS SEPARATE CATEGORY)

SIRTUINS AND THEIR IMPORTANCE IN SKIN

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Introduction: Increasing evidence has demonstrated that sirtuins are a family of NAD+-dependent histone deacetylases that play a critical role in many diverse cellular processes including transcriptional signaling, gene silencing, metabolism, genomic stability, inflammation, energy, stress response, and aging. Here, we present how sirtuin activity can support healthy skin cell functions and how SIRT expression demonstrates temporal variations that are sensitive to UV exposure.

Objective: To define the temporal role of sirtuins in skin by kinetically quantifying SIRT expression and to assess the environmental impact by examining the response to environmental stressors such as UVB and ozone via measuring the effect on energy (ATP) production and oxidative damage (ROS). Additionally, the effect on mechanical properties such as collagen production and cellular spreading will be measured.

Materials and Methods: Sirtuin expression levels by NHEK were kinetically measured via RT-PCR over time. NHEK were exposed to low doses of UVB ($10mJ/cm^2$) and cellular energy (ATP) production as well as oxidative damage (H_2O_2) were measured via ATP-lite lumimetric assay and H_2O_2 fluorimetric detection assay. Finally, the effect of sirtuins on procollagen type I production by NHDFs was quantified via ELISA and cell-spreading of aged NHDFs was measured via confocal microscopy.

Results: Temporal differences in sirtuin expression levels were observed over time. Furthermore, sirtuins were impacted by environmental stressors such as UV-B exposure and ozone resulting in observed differences in ATP and H_2O_2 production. Finally, it was shown that sirtuins (SIRT1, 2, 3 and 6) support cellular functions necessary for skin mechanical properties such as boosting collagen production and increasing cellular-spreading in aging skin cells.

Conclusion: Sirtuins exhibit temporal expression and are sensitive to environmental stressors. Our data shows that sirtuins are beneficial for both cellular integrity and function. Therefore, supporting their activity is imperative for maintaining optimal skin cell processes.





