

AESTHETIC AND COSMETIC DERMATOLOGY (LASERS SEPARATE CATEGORY)

AGE AND LIFESTYLE FACTORS AFFECT AUTOPHAGY PROCESSES IN SKIN

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Introduction: Autophagy is a fundamental cellular process that involves degradation and recycling of damaged cells, proteins and organelles. Autophagy has not been well studied in skin, but is thought to play a fundamental role in skin processes such as barrier formation and pigmentation. To evaluate changes in autophagy in skin with age and lifestyle choices, we conducted a large study of women aged 20-74 years across 4 ethnic groups.

Objective: To characterize the effects of age and lifestyle factors on molecular markers of autophagy in women's epidermis from photoexposed and photoprotected body sites across races/ethnicities.

Materials and Methods: We evaluated molecular effects of aging in 340 US women aged 20-74 years (~25 women per decade), in 4 ethnic groups: Caucasian, Chinese, African, and Latino. Using biopsies from face, arm, scalp and buttocks, transcriptomic profiling was conducted on RNA extracted from laser-capture micro-dissected epidermis with Affymetrix gene arrays. Bioinformatics analysis of gene expression focused on processes pertinent to autophagy and links to age and lifestyle.

Results: Biological processes related to cell damage and apoptosis increased with age in epidermis of sun-exposed body sites (face, arm, scalp), with greatest response in Caucasian women. However, in facial epidermis, markers of autophagy generally decreased with age, with younger-appearing women maintaining autophagy markers with age to a greater extent than older-appearing women. Autophagy markers were also maintained to a greater extent in women who used sun protection, exercised and did not smoke cigarettes.

Conclusions: The essential ability of skin to degrade and recycle damaged cells and their components via autophagy appears to decrease with age, especially in unprotected sun-exposed skin and under certain lifestyle conditions (smoking, lack of exercise).