

Medical and Cosmetic Treatments for Aging Male and Female Hair

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The appearance of hair plays an important role in our overall physical appearance and self-perception. With today's increasing life-expectations, the desire to look youthful plays a bigger role than ever. The hair care industry has become aware of this and is delivering active products directed towards meeting this consumer demand. The discovery of pharmacological targets and the development of safe and effective drugs also indicate strategies of the drug industry.

Hair aging comprises weathering of the hair shaft, decrease of melanocyte function, and decrease in hair production. Comparative gene expression using microarray analysis profiling has demonstrated significant differences between androgenetic and senescent alopecia. While the former is related to decreased expression of genes required for anagen onset and maintenance and increased expression of catagen and telogen inducers, the latter is related to an increased expression of markers for mitochondrial dysfunction and oxidative stress.

The scalp is subject to intrinsic and extrinsic aging. Intrinsic factors are related to individual genetic and epigenetic mechanisms with inter-individual variations: prototypes are familial premature graying, and androgenetic alopecia. Extrinsic factors include UV-R and smoking. Experimental evidence supports the hypothesis that oxidative stress plays a role. Reactive oxygen species are highly reactive molecules that can directly damage cellular structural membranes, lipids, proteins, and DNA.

Pharmacologic treatment modalities with proven efficacy for androgenetic alopecia are minoxidil and finasteride. New insights into the role and prevention of oxidative stress could open new strategies for intervention and reversal of age-dependent hair loss and the hair graying process. Currently, topical anti-aging compounds and hair care products include conditioners, photoprotectors, anti-inflammatory agents, and antioxidants to complement hair growth promoting agents and nutritional therapies. Eventually, topical liposome targeting for melanins, genes, and proteins selectively to hair follicles, the role of hair follicle stem cell types, and biogenineering the hair follicle may represent future strategies for maintenance of healthy and beautiful hair in the young and old.