Medical Treatments for Ageing Male and Female Hair Loss and Alopecia
Prof. Ralph M. Trüeb, MD, Center for Dermatology and Hair Diseases, Wallisellen (Zurich) Switzerland, www.derma-haarcenter.ch

Introduction: The appearance of hair plays an important role in people's overall physical appearance and self-perception. With today's increasing life-expectations, the desire to look youthful plays a bigger role than ever.

Objective: 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.

Materials and Methods: Hair aging comprises weathering of the hair shaft, decrease of melanocyte function, and decrease in hair production. Currently available pharmacologic treatment modalities with proven efficacy for treatment of androgenetic alopecia are minoxidil and finasteride. Comparative gene expression profiling of androgenetic and senescent alopecia using microarray analysis has demonstrated significant differences. While androgenetic alopecia is related to decreased expression of genes required for anagen onset and maintenance and increased expression of catagen and telogen inducers, senescent alopecia is related to an increased expression of markers for mitochondrial dysfunction and oxidative stress.

Discussion: The scalp is subject to intrinsic and extrinsic aging. Intrinsic factors are related to individual genetic and epigenetic mechanisms with interindividual 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 in hair aging. Reactive oxygen species are highly reactive molecules that can directly damage cellular structural membranes, lipids, proteins, and DNA.

Conclusion: New insights into the role and prevention of oxidative stress could open new strategies for intervention and reversal of the hair graying process and age-dependent hair loss. Currently, topical anti-aging compounds include photoprotectors and antioxidants. 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 represent future strategies for maintenance of healthy and beautiful hair in the young and old.