

Analysis of the relationship between skin keratinization and melanin pigmentation and microRNA levels in hair

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Skin is exposed to various environmental factors and various stresses in addition to natural aging, which in turn causes various types of damage to the skin. Ultraviolet rays are one of the environmental factors well known to cause skin damage, and are known to induce skin keratinization and melanin pigmentation, resulting in adverse effects such as wrinkles, spots, and freckles. It is also known that various heavy metals contained in drinking water and food can adversely affect the skin. In particular, arsenic is contained in large amounts in marine products (especially hijiki) that Japanese people consume on a daily basis, and many cases of chronic exposure of arsenic inducing skin keratinization and melanin pigmentation have been reported in the whole world. The purpose of this study was to ‘clarify the expression pattern of miRNAs related to skin keratinization and melanin pigmentation in body hair and the relationship between UV irradiation and arsenic-induced skin keratinization and melanin deposition’. We focused on 11 miRNAs and analyzed their expression patterns in mouse body hair and cultured cell lines derived from skin tissues. In body hairs, miRNAs showed characteristic expression patterns in response to UV and arsenic exposure, and common expression patterns were also observed. In the cell culture experiments, a human skin keratinocyte cell line (HaCaT) and a melanocyte-based cultured cell line (B10F10) were used to analyze miRNA expression patterns. Keratinocyte-specific or melanocyte-specific expression patterns were identified, as well as miRNAs which expression was significantly altered by combined exposure to UV light and arsenic. These results suggest that analysis of miRNA expression patterns using body hair may contribute to the prevention and therapy of skin diseases caused by UV and arsenic exposure.