

The role of exosome in skin aging and its implications to therapy

Masatoshi Jinnin

Department of Dermatology, Wakayama Medical University Graduate School of Medicine

Skin senescence may be induced by various factors including intrinsic aging and extrinsic aging. In this study, we compared the expression of exosome and microRNAs in the serum and skin between young and senescent people. Exosome expression was determined using ELISA and immunostaining. microRNA expression was evaluated by PCR array, real-time PCR analysis, and in situ hybridization. microRNA was forcedly overexpressed using microRNA mimics. Cell senescence was examined by senescence-associated β -galactosidase (SA- β -gal).

We could not find significant correlation of age with exosome expression of serum or skin in young and senescent people. However, according to the result of microRNA PCR array, miR-124 was the most increased microRNA in senescent skin when compared to young skin. in situ hybridization revealed that the signal for miR-124 was evident in keratinocytes of senescent skin, but not in the young skin.

Cultured normal human epidermal keratinocytes (NHEKs) overexpressed with miR-124 mimic changed their morphology to an enlarged and irregular shape. In addition, SA- β -Gal positive NHEKs were significantly increased by the transfection of miR-124 mimic.

The expression of miR-124 was increased in the UVB-irradiated NHEKs compared to control cells in a dose-dependent manner. Taken together, our results indicated that miR-124 is increased by UV irradiation in keratinocytes, which causes cell senescence.