〈原　著〉

# 慢性的 UV-A 暴露による皮膚線維芽細胞の細胞機能変化

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# Functional Changes Induced by Chronic UV-A Irradiation to Human Dermal Fibroblasts

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**Abstract**

UV irradiation induces many damages on skin, extremely photoaging is known to be the result of chronic UV irradiation. Many investigations have been done to clarify the mechanism of photoaging induced by chronic UV-A irradiation. But it has been difficult to clarify the mechanism by *in vivo* experiments due to animal individuality. *In vitro* experiments, it is known that a single UV-A irradiation makes matrix metalloproteinases over express and makes collagen denature. But it has been unclear the mechanisms of the influence of chronic UV-A irradiation. To estimate chronic UV-A influence, we used *in vitro* fibroblast cellular aging system as a model of photoaging. Consequently chronic UV-A irradiation to human normal fibroblasts induced cell life span shortening, increase of cell size as cellular aging properties, and expression of senescence-associated $\beta$-Galactosidase. On extracellular degradation enzymes, matrix metalloproteinase 1 (MMP-1) overexpressed in UV-A irradiation period, but tissue inhibitor of metalloproteinase 1 (TIMP-1) expression little changed by chronic UV-A irradiation. We have concluded that chronic UV irradiation to human normal fibroblasts induced cellular functional changes, following the acceleration of cellular aging and the MMP-1 overexpression.

**Key words:** UV-A, *in vitro* aging, MMP-1, fibroblast, $\beta$-galactosidase.