

〈一般論文〉

培養ヒト皮膚由来線維芽細胞の石灰化に対する UVA の影響

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Influence of UVA Irradiation on Calcification of Normal Human Dermal Fibroblasts

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Abstract

It is well known that ultraviolet rays cause photo-aging. Ultraviolet A (UVA) is the most important factor in photo-aging, especially in human dermis. As investigation of photo-aging *in vitro*, we previously reported that normal human dermal fibroblast (NHDF) was calcified by UVA irradiation. In this study, NHDF was cultured for one day after 0.8 J/cm² UVA irradiation to investigate the influence of UVA irradiation, which calcifies cells. In addition, physiological and molecular biological changes on UVA irradiated NHDF were investigated. As a result, it was suggested that a significant oxidative stress was given to UVA irradiated NHDF, because accumulation of carbonylated proteins were observed in the cell. Moreover, it was elucidated that the intracellular Ca²⁺ mobilization indicated that an induction of inflammation was accelerating because of Ca²⁺ accumulation in the cell. Furthermore, it was suggested that calcification of UVA irradiated NHDF was involved in a decrease in cell survival rate. In molecular biological analysis, gene expression of PiT-1, Runx2, OCN and OPN which were well-known as osteogenesis marker on vascular smooth muscle cell (VSMC), were investigated on UVA irradiated NHDF using molecular biological method. As a result, increasing gene expression of PiT-1 and OPN was observed on UVA irradiated NHDF, although gene expression of Runx2 and OCN was not observed in the cell. From the results in this study, it was elucidated that NHDF calcified by UVA irradiation was involved in some significant damages, oxidation stress, calcium accumulation indicated inflammatory inducement in cells and decreased cell survival rate. On UVA irradiated NHDF, further investigation of physiological, biochemical, and molecular biological approach are required to determine the relationship between these physiological changes and calcification.

Key words: calcification, fibroblast, photo-aging, UVA.