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〈一般論文〉

紫外線による真皮線維芽細胞における小胞体機能変化と皮膚光老化との関連性

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Dysfunction of Endoplasmic Reticulum in Dermal Fibroblasts Induced by UV Irradiation Is Involved in Skin Photoaging

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Abstract

Chronically sun-exposed skin has the characteristic features including a deep wrinkled appearance that is the hallmark of photoaging skin, in which age-related changes in combination with the influence of ultraviolet（UV）rays become advanced. Although these phenomena are related to the reduction of collagen production in dermal fibroblasts, detailed mechanisms are not clear. In this study, we investigated a mechanism of photoaging focused on a cell organelle, endoplasmic reticulum（ER）, in which collagen is produced. As a result, both UVA irradiation and membrane transport inhibitor caused ER enlargement followed by the decrease of collagen（I）mRNA expression level. Additionally, UVA irradiation decreased mRNA expression level of SEC24D, one of coat proteins which form transport vesicles of proteins from ER to the Golgi apparatus. In SEC24D knockdown fibroblasts using RNA interference, ER became larger and procollagen was accumulated in ER. At the same time, collagen（I）mRNA expression level reduced. Both UVA irradiation and SEC24D knockdown increased mRNA expression level of PERK, which is a protein responding to ER-stress. From these results, UVA irradiation was considered to decrease protein transport from ER, followed by ER enlargement owing to abnormal protein accumulation. This ER-stress would cause the decrease of collagen production. Therefore, ER dysfunction induced by UVA irradiation is considered to be one of the mechanisms responsible for collagen reduction observed in photoaging skin.

Key words:　endoplasmic reticulum, photoaging, fibroblast, collagen, transport vesicle.