

〈シンポジウム II〉

『光老化の予防と対策最前線』

光老化とエラスチン

多島新吾

Photo-aging and Elastic Fiber

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Abstract

Lysozyme is a ubiquitous bacteriolytic enzyme present in external secretions, neutrophils and macrophages, but its physiological role is not always clear. Lysozyme is found to associate with elastic fiber in the sun-exposed elderly skin. Long-lived structural protein, elastin, undergoes non-enzymatic glycation leading to the formation of advanced glycation end product (AGE) in the abnormal aggregation of dermal elastic fibers (solar elastosis) of photodamaged elderly skin. To delineate the correlation between lysozyme accumulation and carboxymethyllysine (CML) modification of elastic fibers in the photodamaged skin, immunohistochemical examinations on the sun-exposed skin of various ages were performed. Double immunofluorescence using the antibodies for lysozyme and CML demonstrated that both antibodies co-localized on the elastic fibers, which simultaneously appeared over 40 years of age. Long-standing UV irradiation to human back skin (2MED for 4 weeks) or hairless mice (50 mJ for 12 months) *in vivo* resulted in the appearance of lysozyme and CML-immunoreactive elastic fibers in the dermis, indicating that lysozyme deposits and CML-modification of elastic fibers are related each other. We studied the interaction between CML-modified elastin and lysozyme by a solid phase binding assay *in vitro*, and found that lysozyme binds to CML-modified α elastin. CML-modified α elastin showed accelerated coacervation formation (self-aggregation). These results suggest that lysozyme deposit and CML modification of elastic fibers is essential to abnormal aggregation of elastic fibers of solar elastosis.

Key words: lysozyme, solar elastosis, advanced glycation end product, elastin, photo-aging.