

〈シンポジウム〉

(抗老化化粧品のストラテジー—シワ対策化粧品のストラテジー)

## 抗酸化作用によるシワ対策

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### Effect of Antioxidant to Inhibit UV-Induced Wrinkles

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#### Abstract

Living organisms are protected from harmful ultraviolet (UV) rays by the ozone layer surrounding the earth. However, depletion of the ozone layer and an increase in the amount of UV rays in sunlight reaching the earth's surface have been recently reported. As a result, social concerns over the effects of UV on living organisms have been increasing year by year. The skin covers the outer surface of the body, and so it is most vulnerable to UV. Because UV-induced wrinkles are prominently observed only in sun-exposed areas, they are apparently caused by chronic damage due to accumulated UV exposure. In addition to a change in appearance (large deep wrinkles), histological changes including thickening of the epidermis and dermis, elastin fiber deposition and decreased collagen fibers are observed as a result of continuous UV irradiation. Many reports indicate the involvement of action of reactive oxygen species in UV-induced wrinkles formation. Reactive oxygen species are known to damage essential elements including collagen and elastin which maintain elasticity and firmness of the skin, and also damage the function of fibroblasts producing these elements. It goes without saying that application of UV-absorbing agents is effective in preventing changes associated with photoaging. It is also reported that antioxidants such as vitamins C, E and iron chelators are effective for photoaging. We demonstrate that reactive oxygen species quenchers play an important role in reduction of UV-induced wrinkles formation using a carotenoid, astaxanthin, which has no pro-vitamin A activity unlike  $\beta$ -carotene, and a new iron chelator, *N*-(4-pyridoxylmethylene)-L-serine (PYSer), which consists of biomimetic molecules and effectively suppresses production of hydroxyl radical by chelating iron in skin. The demonstrable and potential roles of antioxidants for suppression of UV-induced wrinkles formation effectively are summarized here.

**Key words:** antioxidative effect, antioxidant, wrinkle, photoaging, reactive oxygen species.