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香粧品学が取り組む研究開発イノベーション
―シワ改善医薬部外品誕生秘話―

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Innovation of Research and Development by Cosmetic Science
―With a Focus on the Story behind the Development of Anti-Wrinkle Quasi-Drug―

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Abstract

With the progressive aging of society, anti-aging cosmetics with high efficacy are strongly demanded. Since wrinkles in particular are well known to influence an aged appearance, cosmetic companies have made huge efforts at developing anti-wrinkle products. However, there were no standardized, objective methods for evaluating wrinkles. To establish a method for evaluating wrinkles, the Japanese Cosmetic Science Society organized a task force committee and published the "Guideline for evaluation of anti-wrinkle products" in 2006. We herein review an anti-wrinkle ingredient whose effect was examined using this guideline. In addition, a detailed explanation of the molecular mechanism to demonstrate an anti-wrinkle effect is also required by the Japanese Ministry of Health, Labour and Welfare for all quasi-drug ingredients. We found that neutrophils, the most abundant white blood cells in mammals, localized constitutively in the skin around the outer corner of the eye, a site at which wrinkles are likely to form. Neutrophil elastase (NE), a serine protease secreted by neutrophils, has a broad substrate specificity, including collagen, elastin, and proteoglycans. Given the role of NE for digesting the extracellular matrix, NE inhibition appears to be a promising target for anti-wrinkle treatments. We found that the NE inhibitor NEI-L1 has a strong NE inhibitory effect and also improves wrinkles, suggesting that NE inhibitors will prove to be novel and effective anti-wrinkle treatments.

Key words: anti-wrinkle, guideline for evaluation of anti-wrinkle products, neutrophil elastase, NEI-L1, innovation.