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〈Regular Article〉

Expression of Hyaluronan Synthase and Collagen Type I mRNA by Hyaluronan Tetrasaccharides in Normal Human Dermal Fibroblasts

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Abstract

The major compounds in the dermis are hyaluronan and type I collagen, which decrease with aging, UV and various other factors. The loss of hyaluronan and collagen with aging is associated with increased dehydration and wrinkling of the skin. We aimed to investigate the influence of hyaluronan tetrasaccharide (HA4) on regulation of high molecular weight hyaluronan (HA) and collagen synthesis in normal human dermal fibroblasts (NHDFs). Expression of hyaluronan synthase (HAS) 1−3 and collagen (COL) 1A1 mRNA were evaluated by quantitative real-time PCR. HAS1 mRNA expression was found to be increased in NHDFs treated with HA and HA4. In addition, it was observed that NHDFs co-cultured with normal human epidermal keratinocytes (NHEKs) showed up-regulation of HAS1 mRNA expression, as compared with NHDFs single cell culture treated with HA4. Treatment of NHDFs with HA4 + derivatized vitamin C (VC-PMg) significantly increased COL1A1 mRNA expression. In this study, we confirmed that HA4 affected HAS1 and COL1A1 mRNA expression; thus, HA4 application may show various action in skin.

Key words: hyaluronan tetrasaccharide, hyaluronan synthase, collagen, mRNA.