Hyaluronan, a nonsulfated glycosaminoglycan, is well known to hold water, maintain the extracellular space, and facilitate the transport of ion solutes and nutrients. Hyaluronan is closely involved in keratinocyte proliferation, migration, and differentiation, and therefore participates in all these regulatory changes. The synthesis of hyaluronan in vitro has been found to be stimulated by several growth factors, retinoid, dibutyryl cyclic AMP and PPAR agonist. We examined the effects of retinaldehyde, retinyl retinoate (a novel retinol derivative) and PPAR-α agonist on hyaluronan expression in primary human keratinocyte and hairless mouse skin. Histochemistry using hyaluronan-binding protein revealed that topical retinaldehyde, retinyl retinoate and PPAR-α agonist raised intensity of hyaluronan staining in murine skin. In addition, both the combination retinaldehyde and PPAR-α agonist, and that of retinyl retinoate and PPAR-α agonist synergistically induced hyaluronan expression. We assessed by RT-PCR the expression level of hyaluronan synthases 2 (HAS2) gene in primary human keratinocyte and hairless mouse skin. We found that retinaldehyde, retinyl retinoate and PPAR-α agonist slightly upregulated mouse HAS2 and human HAS2 mRNA. Concomitant treatment of retinaldehyde and PPAR-α agonist, and retinyl retinoate and PPAR alpha agonist proved to have synergistic effect. Taken together, we suggested that copresence of retinoid and PPAR-α agonist may prevent and improve the cutaneous alterations caused by the loss of hyaluronan in epidermal skin.

Key words: Retinoid, PPAR-alpha, Hyaluronan