

# Functional analysis of a novel epidermal steroid hormone decreasing in the skin with advancing age

**Shogo Haraguchi**

*Department of Biochemistry, Showa University School of Medicine*

The skin, like the gonads and adrenal glands, synthesizes steroid hormones on its own. Steroids synthesized in the gonads and adrenal glands circulate and exert their effects throughout the body. In contrast, those synthesized in the skin are thought to exert their effects locally in the skin. Although there have been many studies on steroid synthesis in the skin, we have newly identified two new cutaneous steroids synthesized in the human epidermis (let us call them Steroid X and Steroid Y). In this study, we aimed to reveal the functions of these two newly identified cutaneous hormones. First, transcriptome analysis was performed to determine what gene expression changes this new cutaneous steroid causes in epidermis-derived skin cell lines. The results suggest that steroid Y causes expression changes in a group of genes involved in the regulation of translation initiation and has a suppressive effect on translation initiation. On the other hand, Steroid X altered the expression of many long noncoding RNAs and transcripts of unknown function, but what kind of cellular functions are involved remains unknown. Therefore, we focused our analysis on steroid Y. We found that steroid Y repressively regulates translation initiation through the regulation of ribosomal protein small subunits (RPSs) and eukaryotic translation initiation factors (eIFs). Epidermal thickening was observed in mice in which this steroid Y synthase was knocked out in the epidermis. When epidermal tissue isolated from human skin was used to analyze the effects of steroid Y, changes in inhibitory regulation of translation initiation were observed. These results suggest that steroid Y suppresses excessive cell differentiation and proliferation in the epidermis, and thus helps to form an appropriate epidermal layer and to prevent skin cells from becoming cancerous.