

GLOBAL SKIN HEALTH

EFFECT OF ACEFYLLINE AND ACEFYLLINE-CONTAINING-CREAM ON SKIN HYDRATION AND BARRIER FUNCTION REGULATION

Mf. Galliano⁽¹⁾ - C. Carrasco⁽¹⁾ - V. Mengeaud⁽²⁾ - S. Bessou-touya⁽¹⁾ - H. Duplan⁽¹⁾

Centre De Recherche Pierre Fabre, Pierre Fabre Dermo-cosmétique, Toulouse, France⁽¹⁾ - Laboratoires Dermatologiques Ducray, Pierre Fabre Dermo-cosmétique, Paris, France⁽²⁾

Introduction: Filaggrin proteolysis and complete catabolism generating the natural moisturizing factor (NMF) is a tightly regulated process to address optimal hydration of the stratum corneum (SC), while compromised filaggrin degradation has been associated with dry skin. During this process, peptidylarginine deiminases (PADs) catalyze the deimination (or citrullination) of filaggrin, which improves its degradation. We previously showed that the xanthine derivative acefylline enhanced PAD activities, both in vitro and ex vivo.

Objective: Here we investigated the effect of acefylline on filaggrin production and degradation in a model of reconstructed human epidermis (RHE) generated under dryness condition. We then investigated the effect of cosmetic creams containing acefylline on lipid neosynthesis and on lamellar lipid spatial organization.

Methods: Submitting RHE to dryness, we observed that RHE responded by upregulation of both profilaggrin and proteases involved in filaggrin catabolism. Consequently, NMF components and citrulline residues were accumulated in this model that could be used to analyse acefylline effect on skin hydration regulation.

Results: Addition of acefylline further promoted filaggrin degradation as shown by a decrease of filaggrin monomers and an increase of filaggrin catabolites and citrulline residues. Those data showed that acefylline stimulated filaggrin degradation in dryness condition. Moreover, treatment of RHE with acefylline-containing-cream significantly stimulated the neosynthesis of most of the lipids involved in the reinforcement of the lipid barrier. XRay-microdiffraction analysis showed that acefylline-containing-creams penetrated into the SC and enhanced hexagonal or orthorhombic lateral-packing organization. Those modifications suggest a reinforcement of the lipid barrier.

Conclusion: our study supports the benefits of treatment of dry skin with adapted formulations containing acefylline to correct hydration, favouring nutrition and strengthening the lipid barrier of the skin.