

ABSTRACT

Skin barrier integrity is mainly maintained at the outermost layer of the skin, which is constituted by supportive molecules. Ceramide constitutes the largest lipids amount in the intercellular lipid matrix. Filaggrin is a protein involved in the stratum corneum mechanical integrity maintenance. Hyaluronic acid mainly acts as a humectant to maintain hydration. Nowadays, moisturizers have been developed to enhance skin barrier protection. Prior to the usage, it is necessary to evaluate the efficacy of the moisturizer formulation. The project aimed to analyze the moisturizer formulation effect on skin barrier integrity by measuring the expression of ceramide biosynthesis, filaggrin, and hyaluronic acid-associated genes. Cytotoxicity tests were conducted prior to the qPCR analysis. In addition, product specificity checks were done to validate the qPCR products. The cytotoxicity test showed the non-toxic product formulation. The concentration of 2.32, 2.11, and 0.21 mg/mL of product, base, and API were applied due to the low toxicity. The qPCR results showed elevated FLG expression, but no changes for CERS3, SMPD1, and HAS2 expressions after cell treatment, which indicated the presence of filaggrin production elevation, but no changes towards the ceramide and hyaluronic acid biosynthesis. The product specificity checks revealed the specific qPCR products, except for SMPD1, in which the difference in sizes and the generation of two peaks in the melting curve analysis proved the low specificity. Nonetheless, the gene expression results indicate the potential of the moisturizer to be further developed to enhance skin barrier maintenance.

Keywords: Skin Barrier Integrity, Ceramide, Filaggrin, Hyaluronic Acid, Moisturizer, Gene Expression.