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Modulation of cell proliferation and differentiation by a new thiazolidine compound (GQ-11) in human reconstructed skin

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Introduction: Tissue repair and regeneration can repair some original tissue structures, but also can result in abnormalities which may harm organ functions. In this process, three stages are described: inflammation, proliferation and remodeling, all of them depending of the synergy of different cell types as neutrophils, macrophages, fibroblasts and keratinocytes for an efficient healing. Persistent hyperglycemia can generate Advanced Glycation End-Products (AGEs), which can promote direct or indirect action of many cell types, starting oxidative stress and promoting delayed and defective healing.

Aim: This study aimed to investigate the effects of a new thiazolidine compound - GQ-11 (PPAR γ and PPAR α partial agonist) on cell proliferation and differentiation in a 3D model of human reconstructed skin with glycosylated collagen.

Methods: Fibroblasts and keratinocytes were isolated from donated human foreskin and reconstructed in a glycosylated collagen matrix. After dermal and epidermal equivalence, skins were subjected to excisional wounding with a 2-mm biopsy punch. Topical treatment was initiated immediately post-injury with GQ-11 new thiazolidine compound (10 μ M) or F-127 pluronic gel (vehicle) for 24 h. Then, skin was collected and analyzed by HE-staining and immunohistochemistry.

Results/Conclusion: GQ-11 treatment showed important induction of keratinocytes proliferation with cytokeratin-14 (CK-14) and Ki-67 protein as immunomarkers at epidermal layer. The α -smooth muscle actin increases at dermal layer also showed interesting fibroblasts differentiation induced by the treatment. Besides proliferation and differentiation, GQ-11 treatment also showed cell adhesion capability increase when analyzing presence of desmoglein-1.

Biography

J C Silva has completed her Bachelor's degree in Nutrition from Mackenzie University (São Paulo, Brazil - 2011) and Master's degree in Science from University of São Paulo. She holds Double Ph.D Degree in Pathophysiology and Biotechnology in Translational Medicine in University of São Paulo/ Università degli Studi di Genova.

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