NEW PLATFORM BASED ON SKIN EQUIVALENT TO EVALUATE SAFETY AND EFFECTIVENESS OF COMPOUNDS AGAINST ULTRAVIOLET RADIATION DAMAGE

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Solar ultraviolet (UV) radiation is the main risk factor to skin cancer and other cutaneous diseases induced by environmental agents. UVA corresponds to 95% of the UV that reach Earth, while only 5% is UVB. Both of them cause serious changes on skin structure and function. UVA may penetrate more deeply in the skin achieving the dermis and it is considered the main responsible for photoaging. Additionally, the implication of UVA on photocarcinogenic process can not be disregarded also. Currently, sunscreen effectiveness is evaluated by sun protected factor (SPF) in humans, nevertheless, this parameter does not properly consider UVA impact on skin. Thus, skin equivalent models are powerful tools to identify specific damage caused by solar exposition. The aim of this study was the assessment the UVA damage on developed skin equivalent model as a promising tool to evaluate the efficacy of new compounds against UVA damage.
The developed full thickness pigmented skin presents similar morphology to human skin main layers. To evaluate UVA damage, tissues were exposed to an irradiation dose of 25J/cm^2 and after 24 hours the tissues were collected and fixed. Samples were analyzed by hematoxylin-eosin and Masson's trichrome staining.
The results demonstrated that UVA radiation caused dermal fibroblasts reduction, probability as a result of apoptosis. Moreover, collagen and elastin fibers decreased leading to thinning of the dermis compared to non-irradiated tissue. Furthermore, the reduction of thickness was also observed in the epidermis. So, irradiated tissue, as a photoaged skin, presents less compact and more disorganized appearance than non-irradiated tissue. These changes were expected due to matrix metalloproteinases (MMP) activation, a well-reported response to UVA radiation. In conclusion, the developed skin equivalent appropriately responds to UVA stimulus and may be employed to evaluate new products effectiveness against skin UV-caused damage. The authors are grateful for FAPESP grant.