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INFLUENCE OF A BIO-CERAMIC ON VIABILITY AND PROLIFERATION CAPACITY OF KERATINOCYTES

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Bioactive ceramics are materials that rapidly bond with hard tissues, stimulating bone growth away from the bone-implant interface. More recently, numerous soft tissue engineering applications have also been investigated. Based on this observation, we evaluated in this study the influence of a bioceramic (BC) of the $\text{SiO}_2\text{-CaO-Na}_2\text{O-P}_2\text{O}_5$ system on the viability and proliferation of keratinocytes, with the objective of using it for skin regeneration. For this, the immortalized human keratinocytes (HaCat) were cultivated in a cell density of 2,000 cells/well in Dulbecco's Modified Eagle's Medium (DMEM) — high glucose. The cells were cultivated in medium without BC and containing 0.1, 1, 5, 10 and 20% (w/v) of BC resuspended in DMEM. Cell viability was assessed by 3-(4,5-dimethylthiazol-2-yl)-2,5-diphenyltetrazolium bromide test (MTT). After three days, the results of the mean absorbance and the standard error of the mean (SEM) were 0.036 ± 0.002 without BC and 0.042 ± 0.003 using 0.1% ($p = 0.911$), 0.056 ± 0.011 using 1% ($p = 0.032$), 0.036 ± 0.006 using 5% ($p = 0.975$), 0.029 ± 0.001 using 10% ($p = 0.722$) and 0.024 ± 0.002 using 20% ($p = 1.000$) of BC. After seven days, the mean of absorbance and SEM were 0.190 ± 0.015 without BC, and 0.199 ± 0.019 using 0.1% ($p = 0.998$), 0.218 ± 0.016 using 1% ($p = 0.7767$), 0.113 ± 0.016 using 5% ($p = 0.072$), 0.039 ± 0.009 using 10% ($p = 0.000$) and 0.026 ± 0.001 using 20% ($p = 0.000$) of BC. These results indicated that this bioceramic is capable of increasing the cell viability of HaCat after 3 days with concentrations of 0.1 and 1%, but a concentration higher than 5% of bioceramic decreases it. That being so, the bioactive ceramics have shown auspicious results for cell viability and proliferation when concentrations is less than 1%, encouraging future studies involving its application in certain tissue engineering applications.