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Evaluation of pH effects on genomic integrity in adipose-derived mesenchymal stem cells using the comet assay

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The use of mesenchymal stem cells (MSCs) in experimental, clinical and therapeutic trials has grown in recent years. However, the issue remains of whether these procedures are completely safe for transplant patients. Therefore, this study was designed and carried out with the aim of evaluating two different comet assay protocols for genomic damage pattern analysis in MSCs derived from adipose tissue. The analyzed and interpreted results suggest that genetic testing is needed to support clonal expansion safety in cell therapy procedures with MSCs. Furthermore, they also suggest that if the comet assay technique would be used as a genomic integrity screening assay, the protocol performed at pH=12 (that yielded a frequency of damaged cells: tail intensity= 9.50 ± 0.60 , tail moment= 0.0122 ± 0.0007 ; results are reported as means \pm standard deviation) would be indicated as genomic damage and that subsequent single-strand breaks occur at pH>13 (frequency of damaged cells: tail intensity= 30.71 ± 4.23 , tail moment= 0.0447 ± 0.0073). Our study demonstrates that in the era of regenerative medicine, it is necessary to standardize and establish a battery of tests in order to identify genomic damage prior to MSC transplantation.

Biography

Andreia Antonioli has a Master's degree in Operative Techniques and Experimental Surgery from the Federal University of Sao Paulo in 1999 and PhD from the same university in 2001. Currently she is an Associate Professor of the Faculty of Medicine of the Federal University of Mato Grosso do Sul. She has experience in Medicine with emphasis in Surgery. She works as guidance teacher in the Postgraduate course in Health Sciences UFMS in the Line of Research in Stem Cells. She is also Coordinator of CeTroGen (Center for Studies in Stem Cells, Tissue Engineering and Genetic Toxicology).

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