**Does LEDs conditioning treatment improve mesenchymal stem cells metabolism and paracrine effects?**

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**Abstract:**

Myocardial infarction is a major cause of morbidity and mortality worldwide. Mesenchymal stem cells (MSCs) are being studied due to the paracrine effects of secreted cytokines and growth factors that decrease inflammation and scar formation and increase local capillarity in infarcted myocardium. However, the loss of MSCs at the transplanted site is large. To address this problem, the use of light sources is a promising tool. In this study, we irradiated MSCs with LEDs seeking positive changes in cell metabolism and enhancing cytokines and growth factors secretion to later improve cardiac function when transplanted into the infarcted heart. Adipocyte derived MSCs were obtained from Fischer-344 male rats (CEUA 5883160218), irradiated once every other day for a week with 630 nm LEDbox (Biolambda, Brazil) and analyzed the repercussion of different radiant exposures (0.5, 2 and 4 J/cm²). Control group was kept in the dark for the same time as 4 J/cm²-placebo. Analyses were performed 24 hours after the last irradiation. None of the radiant exposures induced oxidative stress, DNA damage nor alterations in the levels of TNF-α. The 4 J/cm² irradiation up-regulated mitochondrial metabolism, ATP production and IL-6, IGF-1 and NOx secretion. The 2 J/cm² had no significant action on the MSCs. Besides VEGF levels were significantly higher with 0.5 J/cm², a down-regulation in IL-10 level was detected. Thus, we concluded that the conditioning treatment with 4 J/cm² showed the best results in improving MSCs metabolism and secretion, being a good candidate to perform future cellular therapy in the infarcted myocardium.

**Biography:**

Bárbara Sampaio Dias Martins Mansano graduated as the best academic performance in Biomedicine at Paulista University (2010-2014) and qualified in Human Histology at São Paulo University (2014), performing sandwich graduation in Biomedical Sciences at Wright State University (2012-2013) by the Science Without Borders program (CAPES and CNPq). After, she obtained her master's degree with two honorable mentions in Biological Sciences (Molecular Biology) at Federal University of São Paulo (2015-2017) with FAPESP scholarship. Also, she specialized in Teacher Education for Higher Education at Nove de Julho University (2017-2018). Currently, she is doing a PhD in Biophotonics Applied to Health at Nove de Julho University with CAPES scholarship, participating in published studies and a second-place prize work. Her research interests and experiences are in the fields of Molecular Biology, Biotechnology, Immunology, Biochemistry, Biophotonics and Histology.