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The Photobiomodulation Effect on L6 Cells Viability and Migration by Different Exposure Duration of 532 nm Low-level Laser

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Introduction: Low-level laser has been widely researched and practiced in various medical fields due to its photobiomodulation effects towards diverse types of cells. The effectiveness of photobiomodulation depends on factors such as wavelength, power, and duration of exposure. In this work, we examined the effects of varying exposure durations of 0.1W 532 nm low-level laser light on the viability and migration of L6 rat myoblast cells (CRL-1458) under both direct and indirect irradiation conditions. Exposure times ranged from 30 to 300 seconds. **Materials and Methods:** For direct exposure, L6 cells were directly exposed to 532 nm laser, whereas for indirect exposure the media was first exposed then the cells were added. After laser irradiation, cells are incubated for another 24-hours before proceeding to conduct the assays on cell viability and migration. The viability of cells was measured through MTT assay. In exploring the effect of laser towards the cell migration, scratch assay was done. Real-time imaging was captured and analyzed in ImageJ software. **Results:** Results revealed that direct irradiation significantly improved the cell viability ($p<0.05$) and slightly induced the cell migration compared to indirect irradiation. When irradiated directly for 120s, the rate of migration of the L6 cells increased 14.07% and the area covered increased 16.13% compared to control. When the cells were irradiated directly above 300s, the cells demonstrated significant inhibition ($p<0.05$). **Conclusion:** This work using direct low-level laser irradiation on cells demonstrated a significant effect on cell viability and migration hence it has potential to be utilized as a promising non-invasive approach in muscle repair treatment. This study serves as a foundation on the optimal exposure duration of 532 nm low-level laser for therapeutic use targeted to muscle cells.

Keywords: CRL-1458; green laser; L6 cells, 532 nm laser, low-level laser therapy (LLLT), photobiomodulation