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Photobiomodulation at 830 nm modulates proliferation and migration of wounded fibroblast cells

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Abstract. Wound healing is a complex and dynamic process that involves restoring damaged tissue structure and function. Delayed wound healing often advances to chronic non-healing wounds due to reduced cellular proliferation and migration. Photobiomodulation (PBM) involves the application of low-powered light typically in the visible red and near-infrared (NIR) spectrum to modulate cellular mechanisms and has been shown to speed up healing in vivo; however, the underlying mechanisms are not well understood. This study aims to determine the effect of PBM using NIR light at 830 nm with 5 J/cm2 on the proliferation and migration of wounded human fibroblasts. Commercially acquired human fibroblast cells (BJ-5ta, ATCC® CRL-4001™) were utilised, and two cell models, namely, normal and wounded (central scratch assay), were designed. Cell models were incubated for 24 and 48 h post-irradiation, followed by different investigational tests for cellular morphology and migration rate (inverted microscopy), and proliferation (BrdU, flow cytometry). PBM at 830 nm with 5 J/cm2 modulates cell proliferation and migration and may aid in the enhanced wound repair process observed in vivo.

Apply to be considered for a student ; award (Yes / No)?

Yes

Level for award;(Hons, MSc, PhD, N/A)?

MSc

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