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# Photobiomodulation at 830 nm influences diabetic wound healing in vitro through modulation of inflammatory cytokines

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Diabetes Mellitus (DM) remains a global challenge to public health and is associated with a delay in wound healing, in part due to increased oxidative stress and pro-inflammatory cytokines. Photobiomodulation (PBM) induces wound healing through diminishing inflammation and oxidative stress and has been used for the successful healing of diabetic ulcers in vivo. This study investigated the effects of PBM at 830 nm and a fluence of 5 J/cm2 on inflammation in an in vitro diabetic wounded cell model. To achieve this, fibroblast cells were cultured under hyperglycaemic conditions, wounded via the central scratch, irradiated, and incubated for 24 and 48 h. Levels of pro-inflammatory cytokines (interleukin-6, IL-6; tumour necrosis factor alpha, TNF-α; and cyclooxygenase-2, cox-2) were measured using ELISA. IL-6 levels were decreased at 48 h, while TNF-α and cox-2 levels were increased at 24 h and 48 h, respectively. PBM at 830 nm with 5 J/cm2 decreased IL-6 and TNF-α levels, however, this study found increased levels in cox-2 48 h post-irradiation. Despite TNF-α and cox-2 being pro-inflammatory cytokines, they have been found to promote healing in the early stages of wound healing. PBM at 830 nm with 5 J/cm2 lowers the release of IL-6 by diabetic wounded cells in vitro and may stimulate the early phases of wound healing through increasing TNF-α and cox-2 levels.

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

Yes

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

PhD

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