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The Impact of Low Intensity Laser Irradiation on Lung Cancer Stem Cell Viability and Proliferation

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Abstract content
   (Max 300 words)

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Abstract. Background: Cancer stem cells or tumour initiating cells are cells that have been attributed to metastatic drive and tumour genesis. These cells contribute to cancer recurrence, metastasis, aggressiveness and resistance to therapy. Laser irradiation has been shown to have a diverse range of clinical applications including wound healing and photo dynamic therapy (PDT). Middle infrared (MIR) radiation has shown to inhibit cellular proliferation and induce morphological changes to the cytoskeletal dynamics of A549 lung cancer cells. Recent studies done using Low Intensity Laser Irradiation (LILI) using near-infrared light with a wavelength of 636 nm and fluence between 5- 15 J/cm2 on adipose derived stem cells (ADSCs) which are adult mesenchymal stem cells (MSCs), have shown to have an increase in proliferation, viability and differentiation into smooth muscle cells. The effects of LILI on cancer stem cells have yet to be elucidated. Methodology: Isolated A549 lung cancer stem cells were exposed to a wavelength of 680 nm and a fluence between 10-20 J/cm2, where after cellular responses were monitored after several time intervals to evaluate proliferation and viability with the view to establish at what wavelength and fluence after a specific incubation time LILI causes increased or decreased proliferation and viability. Discussion: This study assists in the understanding of the effects of LILI on isolated lung cancer stem cells by evaluating the results produced and comparing the different effects of different laser parameters on these cells.

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MSc

Main supervisor (name and email)
and his / her institution

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