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Increased Mobility and stem-cell proliferation rate in *Dugesia tigrina* induced by 880nm light emitting diode.

Abstract

The therapeutic effects elicited by photobiostimulation in the near infrared range may be associated with increased proliferation rate of particular cell-types. The present study utilized commercial light emitting diodes to investigate the effects of low-level near-infrared radiation on the proliferation rate of stem cells in amputated planarian. Whole and amputated animals were exposed to either ambient diurnal lighting, darkness, white light, red light, or near-infrared (880 nm) light. Irradiation was consistent for the duration of the experiments and was provided using commercial 5 mm light emitting diodes (~1.0 mW/m^2 in power density and ~0.01 J/cm^2 in radiant exposure). Compared to other groups amputated planarian exposed to near-infrared displayed increased mobility by the 3rd day of exposure ($F_{(4,26)} = 4.31$, $p < 0.04$, $\eta^2 = 41\%$). Higher densities of stem cells were measured in these worms 84 h post injury ($F_{(4,72)} = 4.78$, $p < 0.01$, $\eta^2 = 21\%$). ***These findings suggest that non-coherent light sources with power-densities about 1000 times lower than contemporary low-power laser settings remain effective in generating photobiostimulation effects and warrants further investigation on stem-cell proliferation induced by near-infrared light emitting diodes.***