The Effects of Near Infrared Light and Curcumin on Wound Healing and Tissue Regeneration in Girardia tigrina

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The dangers of infected, non-healing acute and chronic wounds are a major medical concern. This study observed the synergistic effects of the non-ionizing radiation of near infrared (NIR) light and the anti-inflammatory properties of curcumin on wound healing and tissue repair. These two attributes were measured by growth and regeneration rates in Girardia tigrina (brown planaria). It was hypothesized that bisected planaria topically exposed to 20 mg of curcumin and subsequently to the 850 nm wavelength of the near infrared light spectrum would exhibit faster rates of wound healing and regeneration. Groups of planaria were exposed to NIR light, curcumin, or a combination of NIR light and curcumin. Planaria were photographed with a dissecting microscope and camera. The images were analyzed using ImageJ software to measure growth and regeneration. DAPI staining was performed to observe nuclei in the blastema regions. Results showed that planaria topically exposed to curcumin and subsequently exposed to NIR light regenerated the fastest. This study shows that the synergistic effects of low level light therapy using near infrared light and the immunostimulant curcumin have great potential for expedited wound healing and tissue repair.

Awards Won:

Second Award of $2,000