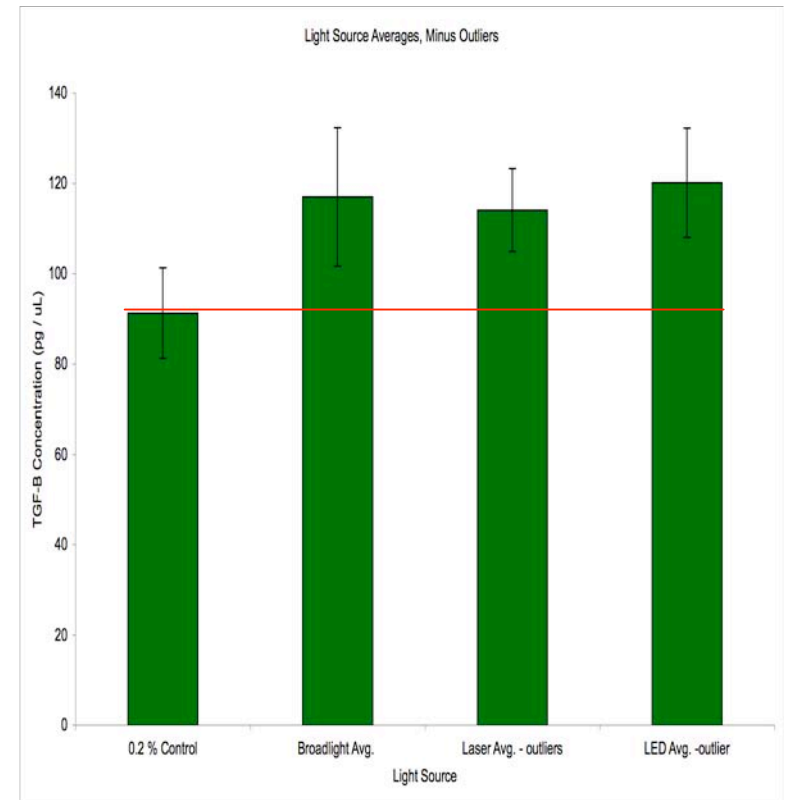


Harvard group investigates how lasers improve wound healing through activation of transforming growth factor beta

Tristan Hunt¹, Praveen Arany², David Mooney²

¹University of Notre Dame, ²Harvard University

In recent years, low-level lasers have been used as a treatment to improve wound healing. Although the treatment's advantageous effects are readily apparent, the precise biological pathway from radiation to healing has yet to be fully unraveled. We have identified transforming growth factor beta (TGF- β), a protein involved in regulating the cell cycle and cell differentiation, as one of the links between laser radiation and improved wound healing. This study focuses on how lasers, and possibly other light sources, can activate, or "turn on" TGF- β . TGF- β has previously been shown to be activated through various means including heat, pH change, reactive oxidative species (ROS) and proteases. We think lasers act through one of these pathways to activate TGF- β . Additionally, we are looking at the potential for other light sources - LEDs and filtered broadlight - to also activate TGF- β . Using low-level lasers, LEDs, and filtered broadlight we radiated samples of serum containing latent TGF- β and various ROS and protease inhibitors. We then assayed the samples for TGF- β activation, ROS activity and protease activity. Overall, all three light sources appear capable of activating TGF- β and our data suggest both ROS and proteases are involved in that activation. With a better understanding of this mechanism we can hopefully strengthen, broaden and improve laser wound-care treatments.



TGF- β Activation by Various Light Sources. Fetal Bovine Serum was radiated by various wave lengths of broadlight, low-level lasers and LEDs. TGF- β activation was then determined and the average activation for each light source was plotted against an un-radiated control.

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