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Low-level laser (light) therapy (LLLT) in skin: stimulating, healing, restoring

Pinar Avci [1], Asheesh Gupta, Magesh Sadasivam, Daniela Vecchio, Zeev Pam, Nadav Pam, Michael R Hamblin

Affiliations

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Abstract

Low-level laser (light) therapy (LLLT) is a fast-growing technology used to treat a multitude of conditions that require stimulation of healing, relief of pain and inflammation, and restoration of function. Although skin is naturally exposed to light more than any other organ, it still responds well to red and near-infrared wavelengths. The photons are absorbed by mitochondrial chromophores in skin cells. Consequently, electron transport, adenosine triphosphate nitric oxide release, blood flow, reactive oxygen species increase, and diverse signaling pathways are activated. Stem cells can be activated, allowing increased tissue repair and healing. In dermatology, LLLT has beneficial effects on wrinkles, acne scars, hypertrophic scars, and healing of burns. LLLT can reduce UV damage both as a

treatment and as a prophylactic measure. In pigmentary disorders such as vitiligo, LLLT can increase pigmentation by stimulating melanocyte proliferation and reduce depigmentation by inhibiting autoimmunity. Inflammatory diseases such as psoriasis and acne can also be managed. The noninvasive nature and almost complete absence of side effects encourage further testing in dermatology.

Figures

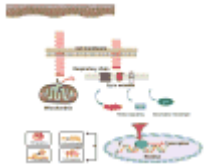

Figure 1 Mechanism of action of LLLT....

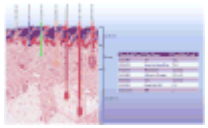

Figure 2 Tissue penetration depths of various...

Figure 3 Examples of LLLT devices in...

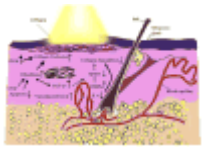

Figure 4 Possible mechanism of actions for...

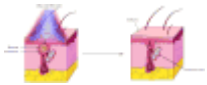

Figure 5 Illustration of acne treatment with...

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