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Review [Photomed Laser Surg.](#) 2016 Dec;34(12):599-609. doi: 10.1089/pho.2015.4048.

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Photobiomodulation: Implications for Anesthesia and Pain Relief

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Abstract

Objective: This review examines the evidence of neural inhibition as a mechanism underlying pain relief and anesthetic effect of photobiomodulation (PBM).

Background: PBM for pain relief has also been used for more than 30 years; however, the mechanism of its effectiveness has not been well understood.

Methods: We review electrophysiological studies in humans and animal models and cell culture studies to examine neural responses to PBM.

Results: Evidence shows that PBM can inhibit nerve function in vivo, in situ, ex vivo, and in culture. Animal studies using noxious stimuli indicate nociceptor-specific inhibition with other studies providing direct evidence of local conduction block, leading to inhibited translation of pain centrally. Evidence of PBM-disrupted neuronal physiology affecting axonal flow, cytoskeleton organization, and decreased ATP is also presented. PBM changes are reversible with no side effects or nerve damage.

Conclusions: This review provides strong evidence in neuroscience identifying inhibition of neural function as a mechanism for the clinical application of PBM in pain and anesthesia.

Keywords: LLLT; PBM; low-level laser therapy; nerve; neuralgia; pain.

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