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Short title: Different mechanisms of photobiomodulation with 810 nm and 980 nm

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Abstract

Photobiomodulation (PBM) using red or near-infrared (NIR) light has been used to stimulate the proliferation and differentiation of adipose-derived stem cells. The use of NIR wavelengths such as 810nm is reasonably well accepted to stimulate mitochondrial activity and ATP production via absorption of photons by cytochrome c oxidase. However, the mechanism of action of 980nm is less well understood. Here we study the effects of both wavelengths (810 nm and 980 nm) on adipose-derived stem cells in vitro. Both wavelengths showed a biphasic dose response, but 810nm had a peak dose response at 3J/cm^2 for stimulation of proliferation at 24 hours, while the