

Accepted Manuscript

Photobiomodulation of human adipose-derived stem cells using 810 nm and 980 nm lasers operates via different mechanisms of action

Yuguang Wang, Ying-Ying Huang, Yong Wang, Peijun Lyu, Michael R Hamblin

PII: S0304-4165(16)30382-8
DOI: doi: [10.1016/j.bbagen.2016.10.008](https://doi.org/10.1016/j.bbagen.2016.10.008)
Reference: BBAGEN 28634

To appear in: *BBA - General Subjects*

Received date: 12 August 2016
Revised date: 4 October 2016
Accepted date: 12 October 2016



Please cite this article as: Yuguang Wang, Ying-Ying Huang, Yong Wang, Peijun Lyu, Michael R Hamblin, Photobiomodulation of human adipose-derived stem cells using 810 nm and 980 nm lasers operates via different mechanisms of action, *BBA - General Subjects* (2016), doi: [10.1016/j.bbagen.2016.10.008](https://doi.org/10.1016/j.bbagen.2016.10.008)

This is a PDF file of an unedited manuscript that has been accepted for publication. As a service to our customers we are providing this early version of the manuscript. The manuscript will undergo copyediting, typesetting, and review of the resulting proof before it is published in its final form. Please note that during the production process errors may be discovered which could affect the content, and all legal disclaimers that apply to the journal pertain.

Photobiomodulation of human adipose-derived stem cells using 810nm and 980nm lasers operates via different mechanisms of action

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

Yuguang Wang^{1,2,3,4}, Ying-Ying Huang^{3,4}, Yong Wang^{1,2}, Peijun Lyu^{1,2,*}, Michael R Hamblin^{3,4,5,*}

1. Center of Digital Dentistry, Peking University School and Hospital of Stomatology, Beijing China
2. National Engineering Laboratory for Digital and Material Technology of Stomatology, Beijing, China
3. Wellman Center for Photomedicine, Massachusetts General Hospital, Boston, MA, 02114, USA.
4. Department of Dermatology, Harvard Medical School, Boston, MA, 02115, USA
5. Harvard-MIT Division of Health Sciences and Technology, Cambridge, MA, 02139, USA

* Corresponding authors:

Peijun Lyu: Tel. +86 10 62188981; fax. +86 10 62142111. E-mail address: kqlpj@bjmu.edu.cn

Michael R Hamblin: Tel. +1 617-726-6182; fax. 617-726-8566. E-mail address: hamblin@helix.mgh.harvard.edu

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 $3\text{J}/\text{cm}^2$ for stimulation of proliferation at 24 hours, while the

Download English Version:

<https://daneshyari.com/en/article/5508271>

Download Persian Version:

<https://daneshyari.com/article/5508271>

[Daneshyari.com](https://daneshyari.com)