

**THERAPY:** ADVANCED RED LIGHT BED THERAPY (Photobiomodulation)

**CONDITION:** Multiple Sclerosis

**ARTICLE LINK:** [https://www.jimmunol.org/content/202/1\\_Supplement/193.16](https://www.jimmunol.org/content/202/1_Supplement/193.16)

---

**Photobiomodulation therapy (PBMT) regulates the production of IL-10 and IFN- $\gamma$  by peripheral blood mononuclear cells (PBMC) and CD4+ T cells isolated from subjects with Multiple Sclerosis (MS)**

Miguel Tolentino, Chi C. Cho and Jeri-Anne Lyons J Immunol May 1, 2019, 202 (1 Supplement) 193.16

**Abstract**

Multiple sclerosis (MS) is a CD4+ Th1/Th17 mediated autoimmune disease characterized by myelin destruction, neurodegeneration and mitochondrial dysfunction. Current therapies suppress inflammation during early stages but are not effective in chronic stages characterized by oxidative damage. New therapies to slow progression, offer neuroprotection, and ameliorate the symptoms at any stage are urgently needed.

Photobiomodulation therapy (PBMT) with light at 600–1100 nm is demonstrated to improve inflammatory and neurodegenerative disorders by down-regulating pro-inflammatory mediators and up-regulating anti-inflammatory mediators.

Our lab showed that PBMT with 670nm light reduced clinical severity in the C57BL/6 experimental autoimmune encephalomyelitis (EAE) model of MS by down-regulation of oxidative stress, apoptosis and pro-inflammatory cytokines, and up-regulation of anti-inflammatory cytokines. Data presented here evaluate the effect of PBMT on cytokine production by immune cells isolated from MS patients and healthy donors.

PBMC and CD4+ T cells activated with Phytohaemagglutinin (PHA) or CD3/CD28 activator, respectively, received PBMT in vitro and cytokines were measured in cell culture supernatants by ELISA. Light at 670nm and 830nm increased IL-10 and reduced IFN- $\gamma$  produced by PBMC from MS patients. Light at 670nm, 735nm and 830nm increased IL-10, whereas 670nm and 830nm, but not 735nm, light reduced IFN- $\gamma$  produced by CD4+ T cells. Light at 670nm and 830nm reduced IFN- $\gamma$  produced by PBMC, while 830nm light increased IL-10 production by CD4+ T cells isolated from healthy donors.

**Our results demonstrate that PBMT differentially regulates the immune response in persons with MS and healthy donors.**

*Copyright © 2019 by The American Association of Immunologists, Inc.*