

VielightNEWS

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"Where there is purpose, there is hope." George Washington Carver

Important novel discoveries were made in a Vielight collaborative study.

Vielight Neuro RX Gamma Shines in a Brain Injury Study

The sports medicine community recognizes that concussions from repetitive blows to the head are major public health concerns. To address this issue, Vielight is dedicating resources to seek for a solution using non-invasive transcranial photobiomodulation (tPBM) modality. We try to be a part of the solution by investing in quality research and development of tPBM devices as potential treatment options. We work with research labs such as Dr Margaret Naeser's at the Boston University School of Medicine in association with the Boston VA.

Several universities employ Vielight devices in their independent research. One such research center, headed by Dr. David Tate at the University of Utah Department of Neurology, studied concussion using the Vielight RX Gamma as a treatment modality. They presented the results of their study at the recent 10th Annual Symposium of the Sports Neuropsychology Society in Dallas, Texas. Through this independent study, over a period of eight weeks, they studied 49 male and female former athletes with histories of concussion and/or repetitive subconcussive

events. All participants had concussive symptoms caused by repeated blows to the head. The university-led study used the Vielight Neuro RX Gamma to alleviate common symptoms of concussion. The



research team reported significant differences in their pre- and post-treatment experiences. When the RX-Gamma was used, there were improvements in symptoms of depression, post-traumatic stress, adjustment, sleep quality, reaction time, and bilateral grip strength. The RX Gamma is a clinical trial version of the Vielight Neuro Gamma tPBM device. Both are designed for home use. A summary of the findings

Utah U completed a concussion study using Vielight RX Gamma.

A new study shines light on cellular mechanisms and tPBM.

Plans to expand online PBM educational materials library.

can be accessed here: <https://www.vielight.com/wp-content/uploads/2022/05/TPBM-Treatment-Effects-in-Former-Athletes-with-Repetitive-Head-Hits-Liebel-04-22.pdf>.

Commenting on this study, Vielight's CEO, Dr. Lew Lim, remarked, "The University of Utah's study supports the positive effects that photobiomodulation (PBM) has on post-concussion symptoms. We are grateful that this university chose the Vielight Neuro RX Gamma to test our assumption that it could help with these circumstances. The encouraging results from this study give hope to people suffering from brain injury that healing is possible, when PBM is applied to the brain with the RX Gamma. Vielight's only role in this independent study was to supply the devices."

Vielight-Sponsored Study Discovers New Understanding in PBM Mechanisms

As part of the effort to develop more effective PBM devices, Vielight continues to invest in understanding fundamental cellular mechanisms related to PBM. In another study, Vielight collaborated with Dr. Jack Tuszyński's lab at the University of Alberta. The aim of this study was to better

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understand how photons (light) delivered to the brain via PBM behave and participate in cellular mechanisms and how the cells receive, process, and transmit signals within themselves and their environment.

Although the efficacy of PBM has been reported over the years, its biochemical mechanisms are still poorly understood. For example, the effects of PBM on living cells and the role of microtubules in neuronal signaling are largely unknown.

Several important novel discoveries were made in our collaborative study with Dr. Jack Tuszyński's lab.

Firstly, living cells were exposed to light from a Vielight 810 Infrared LED in an in vitro experiment. The results showed that the cells responded with an increase in electrical current flow and resistance in the microtubules. This may suggest that PBM controls the toxic actions of excitatory neurotransmitters with inhibitory capabilities by keeping them in check.

In the second set of experiments, the research team studied how microtubules within a cell respond to low-intensity PBM. The microtubules were observed to disassemble widely, when they were exposed to low-intensity near-infrared (NIR) light. This discovery suggests that low-intensity NIR PBM causes the mitochondria (the cells that create energy for all cells in a body) to be more active. It suggests that low-intensity NIR PBM causes mitochondrial activity to increase, and demonstrates the efficacy of low-intensity PBM.

In the final set of experiments, the incubating solution for the tissues was changed slightly. It produced effects that were opposite to that observed in the earlier experiment when microtubules were observed to reassemble. This experiment shows that PBM produces different outcomes when the solutions are changed, reflecting dynamic tissue properties in living organisms.

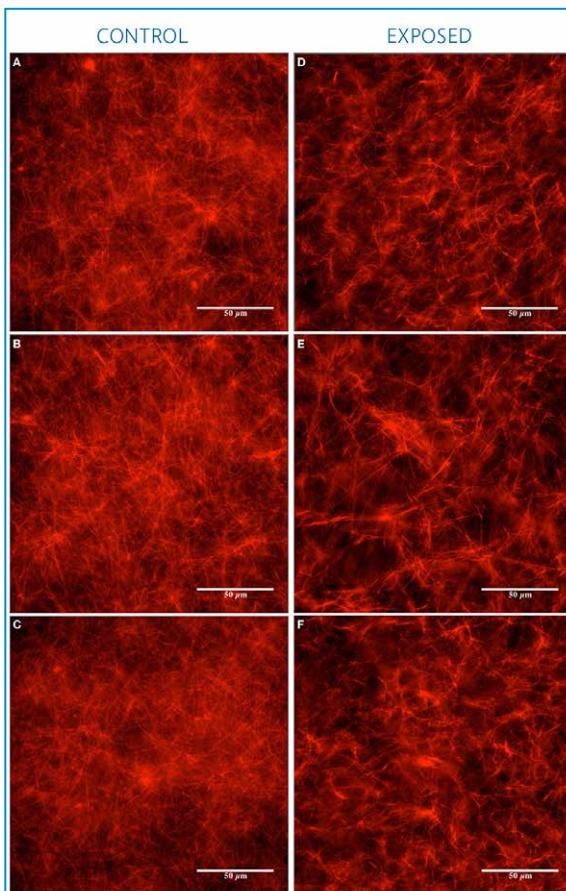
In summary, the experimental results at the University of Alberta show that mechanisms of PBM are even more complex

than expected. There is more work to be done to fully understand the mechanisms and how their systems can be controlled. Vielight has plans for more research in this area, which may lead to personalized PBM parameters in the future. Our work continues!

This paper can be accessed at: <https://www.frontiersin.org/articles/10.3389/fmedt.2022.871196/full>.

Vielight Plans for More Online Public Education

PBM is increasingly recognized for its potential to improve health and well-being. This opens the field to future research in understanding the complex and intriguing



Fluorescence microscopy images obtained during the study, "Near-Infrared Photobiomodulation of Living Cells, Tubulin, and Microtubules In Vitro".

processes which our bodies undergo to heal themselves when given help from PBM. We receive increasing requests for education, particularly in response to the introduction of our sophisticated Neuro Pro device. Attendees of our first webinar on the potential of the Neuro Pro on

March 31, 2022 expressed their appreciation. The webinar can be viewed here: <https://www.youtube.com/watch?v=xiaVM68PQj0&t=43s>.

We plan to organize more teaching webinars on PBM, particularly regarding how it can help one's mental health. In the meantime, due to increasing demands on our staff resources, we are likely to scale back our presence in conferences. Please, continue to follow us for further updates.

We welcome Dr. Mahroo Karimpoor

The latest addition to our research team is Dr. Mahroo Karimpoor, PhD, as a Research Scientist in Photobiomodulation and Cell Therapy and Tissue Engineering. Mahroo is also an expert meditator and will be involved in the areas of meditation and mindfulness. Her last engagement was in tissue engineering and related disciplines at University College, London, UK.

Recent Educational Media

These educational videos and podcast would be of interest to those interested in Vielight and PBM technology:

Penijean Gracefire and Sanjay Manchanda - Neuro Pro Photobiomodulation - Discovering the Possibilities Webinar. March 31, 2022: <https://www.youtube.com/watch?v=xiaVM68PQj0&t=43s>.

Lew Lim. Cognitive Enhance with Light Therapy. NuroFlex Podcast. March 8, 2022: <https://open.spotify.com/episode/3xYC-0B41rU0mWj0W31kmAy>.

Lew Lim. Photobiomodulation - The Energy-based Path to Higher Consciousness and Wellness. Immersive Wellness Summit 2021, Quantum University. October 9, 2021: <https://www.youtube.com/watch?v=IkuevUXLR8k>.

Lew Lim. A Pivotal Clinical Trial Evaluating a Home-used Photobiomodulation Device in the Treatment of COVID-19 Respiratory Symptoms. PBM 2021, October 1-3, 2021: <https://www.youtube.com/watch?v=2j-3h1NrKSs>.

Lew Lim. Quantum Elements in Brain Photobiomodulation: new discoveries and new theories. PBM 2021, October 1-3, 2021: <https://www.youtube.com/watch?v=u-2l1aepfcMo>.

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