

## Photobiomodulation: Light as medicine

**Not many people today realise that absolutely everything within their body relies on the function of healthy mitochondria.** Almost every cell type contains them: heart, liver, brain, nerve, retinal, cells that have higher energy demands like these contain mitochondria than others. Almost 90% of your body fuel is derived from reactions taken place within the mitochondria.

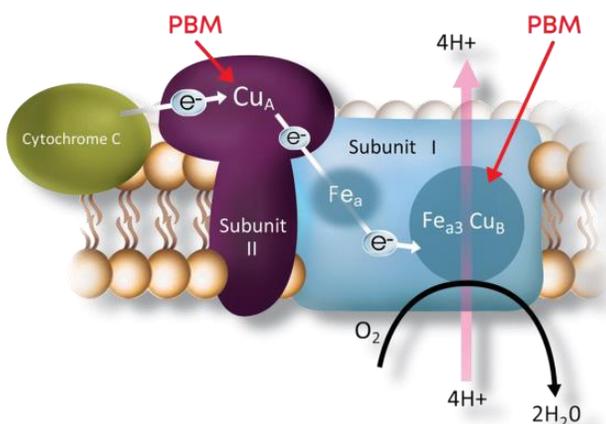
It's well known that sunlight provides us with the ability to synthesize Vitamin D, but how can the other types of light we encounter benefit us? Every day we absorb red and near infrared (NIR) light, likely without realising the positive impact these spectra could have on our lives.

Even a normal, modern lifestyle unwillingly introduces chemical stresses into our body whether it be via diet, alcohol, smoking, environment or age-related factors. This can lead to oxidative damage in our body, specifically to mitochondria the important energy-producing organelles found in our cells by the thousands.



Damage to the cellular mechanisms of mitochondria left unrepaired can lead to mutations in mitochondrial DNA (mtDNA) and decreased efficacy of chemical energy (adenosine triphosphate) production.

Luckily, Photobiomodulation (PBM) can help reduce the extent of this damage leading to less oxidative stress and healthier mitochondrial homeostasis which has beneficial, progressive indications. PBM effects the mitochondria in a positive way by bolstering two primary chromophores (light reacting compounds) using specific wavelengths of safe red, amber and near infrared (NIR) light.



*PBM targets of the mitochondria electron transport chain*

Cytochrome-C oxidase (CCO) enzymes, found on the inner membrane of the mitochondria, absorb photons produced by the PBM LED module in the NIR spectrum leading to disassociation of its inhibitor (mitochondrial Nitric Oxide).

The removal of this inhibitor allows for more oxygen to bind within the mitochondria during a process called oxidative phosphorylation. This leads to an increase in production of cellular chemical energy called Adenosine Triphosphate (ATP) and release of reactive oxygen species (ROS).

The balanced release of ROS via Ion gated channel involvement leads to cytoprotective signalling of a well-studied inflammatory factor (NF- $\kappa$ B) which in turn induces

over 150 genes, where most of which then integrate into mechanisms to combat cellular stress. Meanwhile, an increase in cellular energy (ATP) and upregulation of several genes involved in its production allows the body to respond more effectively to combat inflammation, reduce pain, drain swelling and increase mobility without the use of pharmaceutical alternatives.

PBM's increase in mobility and analgesic applications can be used in a variety of situations such as training recovery; improving muscle strength and decreasing injury recovery time. As well as in arthritis, stroke recovery, neurodegeneration, chronic fatigue and autoimmune disease. More pain related conditions treatable using PBM include fibromyalgia, surgery recovery, myofascial, back and neck pain relief. Furthermore, PBM's bolstering effect on collagen can reduce the physical signs of ageing such as wrinkles and hair loss without the need for more expensive and invasive procedures.

After being the first in the UK to install the Novo-Thor whole body light pod (winner ESRE 2016 innovation of the year), John Rose Eye Care is now the **world's first optometrist** to introduce the new, exciting system specifically designed to treat dry age-related macular degeneration and other ailments of the eye(s), Valeda's multi-phase light delivery system.

Pay as you go prices are redeemable for a treatment package plan for a certain time so whether you require specific treatment, are looking to supplement a healthy lifestyle or just feel like you need a boost – photobiomodulation, the science of light as medicine. Come in store, ring or book online now.



Top: NOVOTHOR full body PBM pod.

Below: Valeda light delivery system

<u>Whole body Photobiomodulation Light Pod</u>			<u>Valeda LDS Assessment and Treatment</u>
<b>Number of sessions</b>	<b>Non-Direct Debit clients</b>	<b>Direct Debit clients</b>	<b>Suitability assessment** £450</b>
1	£70	£50	<b>Valeda Treatment course +£1200*</b>
5 (paid in advance)	£300	£225	
10 (paid in advance)	£500	£400 + 1 Complimentary	
<b>Call 02085469292</b>			

\*-£200 if treating one eye only.  
 \*\*Must be undertaken by all clients