



Hue Light

IMMUNITY CARE SYSTEMS

WB-PBM  
**Whole-body  
Photobiomodulation  
Chamber**



# Whole-body PBM Chamber

(Whole-Body Photobiomodulation)



## Product Specifications

**Device:** Whole-body PBM chamber

**Model:** WB-PBM03

**Wavelengths:** 6 wavelengths ranging from 530-940nm

**Irradiance:** cm<sup>2</sup>/70mW (0.070W), Aluminum used for spectral irradiance

**Power:** Maximum 4,000W/38A

**Weight:** 220 kg

**Dimension:** 220cm (L) x 1060cm (H) x 900 (W)

**Switchable Frequencies:** 8 Levels of Nogier Frequency settings

**Care time setting:** 8-20 minutes

**Max time setting:** 5 Hrs 50 min (continuous operation)

**Inner Structure :** Flat surface, easier to get in and out of it.

**Other Functions:** External Controller, UV-C sterilization feature,  
Countdown timer, Bluetooth, External control app

# Controllers

## Touchscreen

90mmx150mm Wide

You can easily select and control your chamber with our external controller.



## Care management with a smartphone app

Now, only available in Android phones and tabs



**Weight:** 17 kg

**Dimension:** 554mm (L) x 1100mm (H) x 400mm (W)

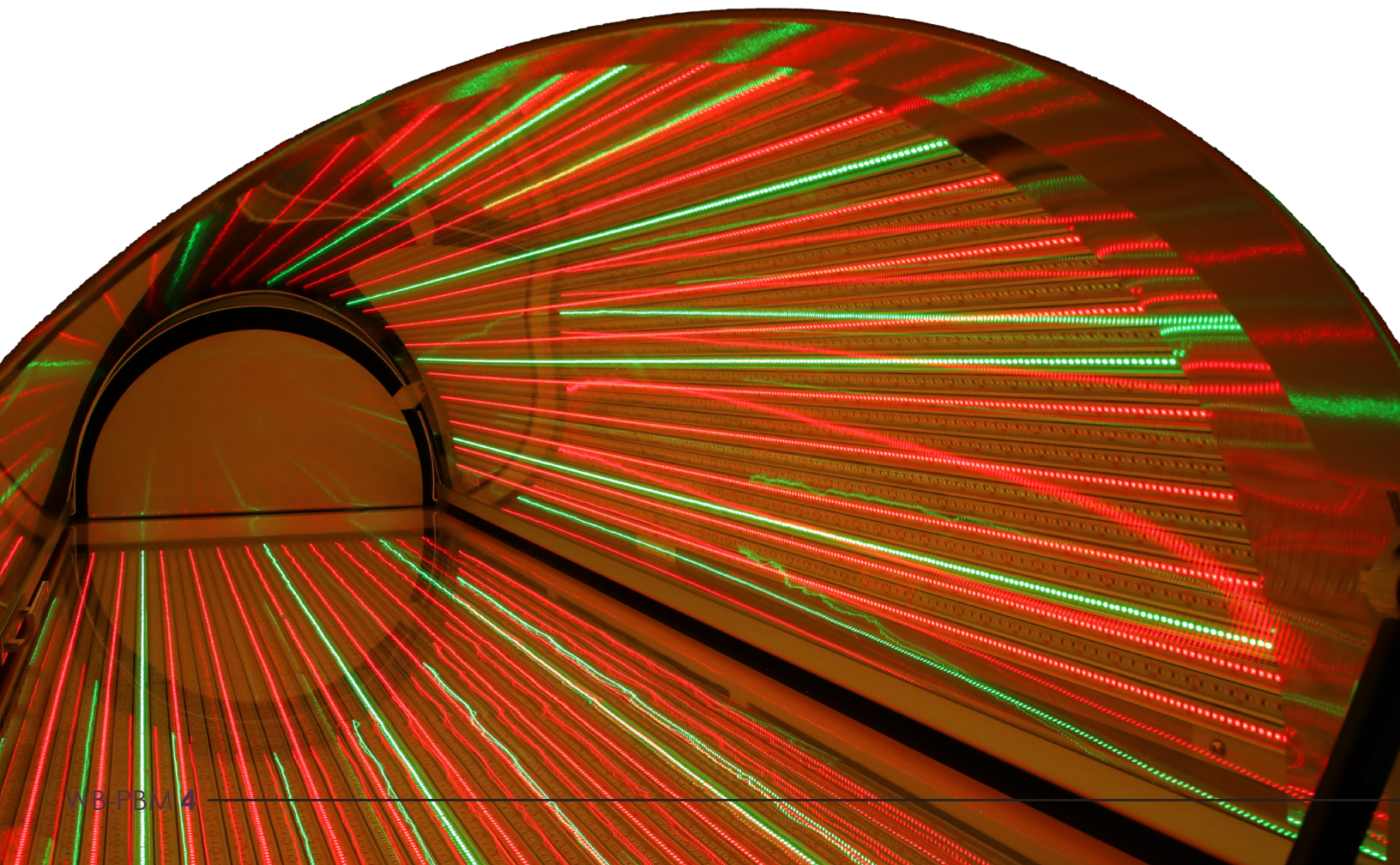


# What is **Photobiomodulation (PBM)**?

PBM technology is characterized by the absorption of light absorbers called cytochrome oxidase (CCO enzyme) in cells when tissues are irradiated with specific wavelengths of force, which produce much more ATP.

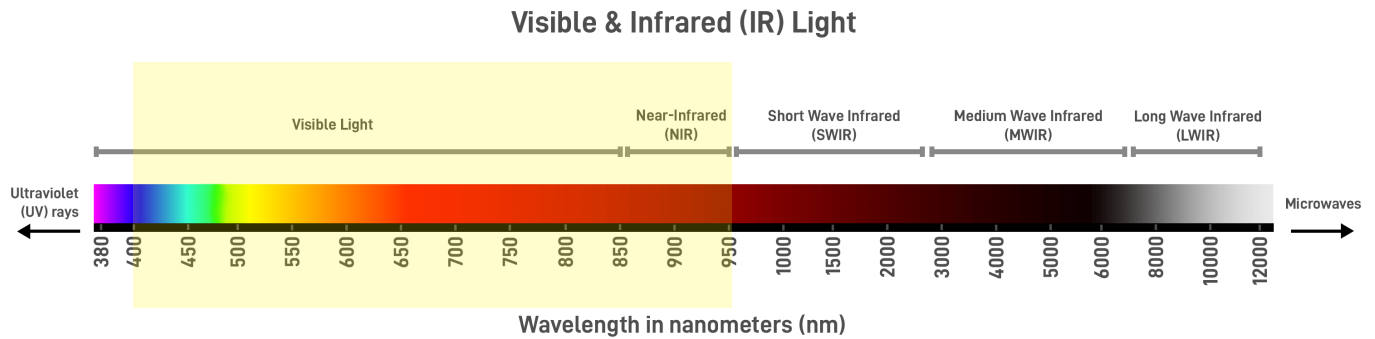
At the same time, nitrogen oxide (NO) is produced from endothelial cells of blood vessels, which improve blood circulation by increasing the elasticity of blood vessels, and as a result, nutrients and oxygen can be transferred smoothly to cells.

It is a term that summons the aiding process of cellular reproduction and blood circulation by the particular wavelength of light source. This keyword has been presented in December 2016 as a future clinical method in the medical subject headings (MeSH) by the United States' National Institute of Health (NIH).



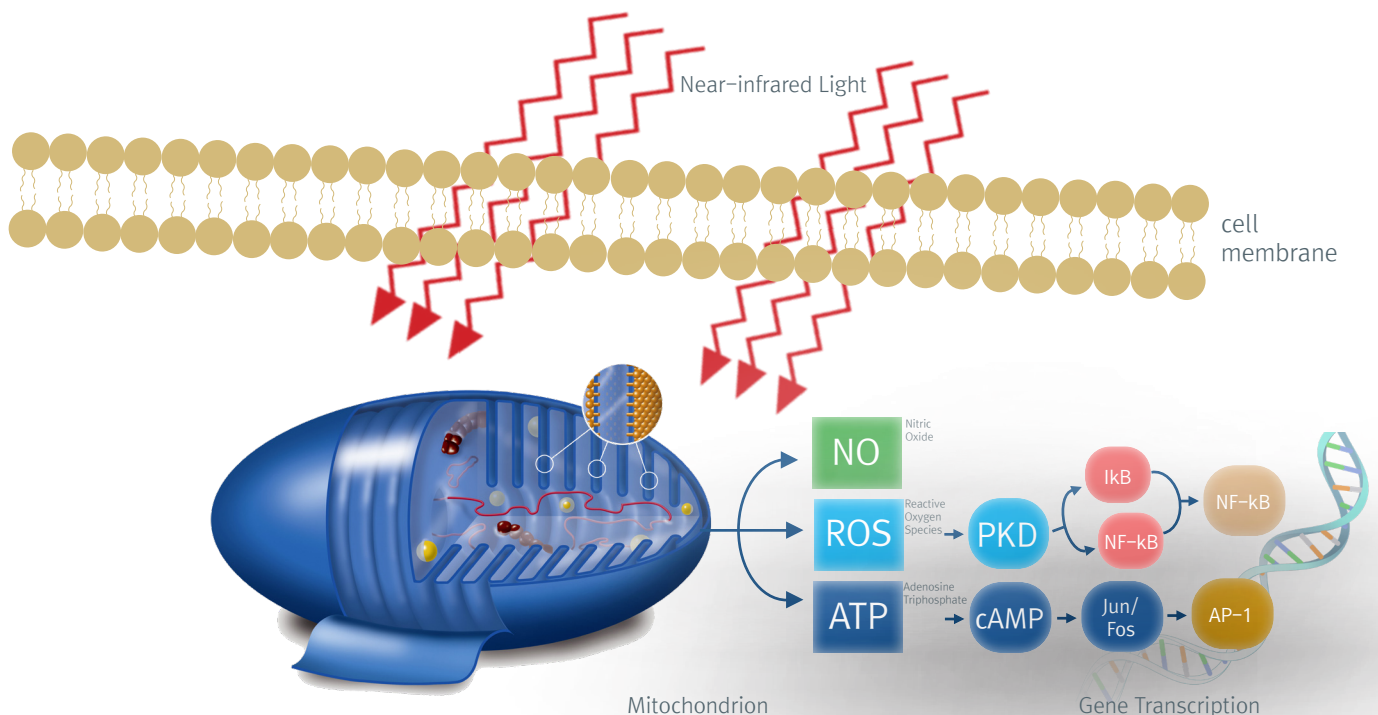
# Light Spectrum - PBM range

Light wavelength spectrum typically used for photobiomodulation (PBM) includes visible and near-infrared light.



## PBM THERAPY MECHANISM

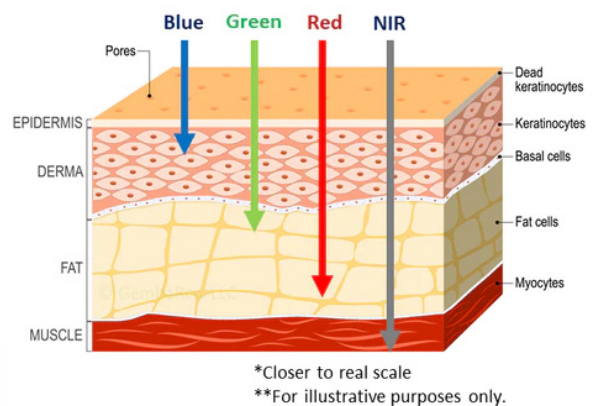
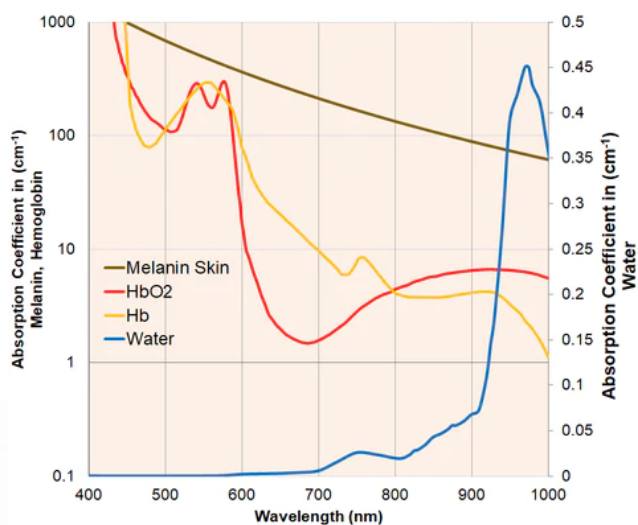
PBM light penetrates to the skin to the mitochondria. In the mitochondria, ATP synthesis, NO signaling and ROS is generated. Then, through the gene transcription process, protein gets synthesized.





# Powerful Healing of PBM Therapy

Low-level laser therapy typically includes light wavelengths of visible light, generally red light, to near-infrared (NIR) light spectrum. Typically, most studies agree that NIR penetrates much deeper into the skin more than red wavelengths. A review article by Dr. Hamblin stated that red wavelengths (600–700nm) penetrated up to 1mm while NR (780–980nm) penetrated more to 2mm with 63% intensity reaching those depths (Zein, Selting & Hamblin, 2018). Most studies agree that around 810nm offers the best penetration as it is the lowest interesection point of absorption factors (water, hemoglobin and melanin). Our Abdomen PBM Irradiator is equipped with LED chips ranging from 840–950nm.



## Optical Window for Skin Absorption Spectrums for Water, Hemoglobin and Melanin

Penetration is mostly wavelength dependent due to the optics of the skin. Optical window is the least absorption by melanin, hemoglobin and water between 600nm to 900nm.

(Image retrieved from <https://gembared.com/blogs/musings/how-deep-does-red-and-near-infrared-wavelengths-penetrate-into-the-body-marketing-vs-science>)

## Relative Penetration in the Skin

Attenuation down to 1% occurs for light wavelengths of 250–280 nm at around 40 μm depth; for 300 nm at 100 μm; for 360 nm at 190 μm; for 400 nm at 250 μm; for 700 nm at 400 μm; for 1.2 μm at 800 μm\* similar diagram from the following study (Ash, Dubec, Donne & Bashford, 2017).

(Image retrieved from <https://gembared.com/blogs/musings/how-deep-does-red-and-near-infrared-wavelengths-penetrate-into-the-body-marketing-vs-science>)

## References

- Ash, C., Dubec, M., Donne, K., & Bashford, T. (2017). Effect of wavelength and beam width on penetration in light-tissue interaction using computational methods. *Lasers in medical science*, 32(8), 1909–1918. <https://doi.org/10.1007/s10103-017-2317-4>
- Zein, R., Selting, W., & Hamblin, M. R. (2018) Review of light parameters and photobiomodulation efficacy: Dive into complexity. *Journal of Biomedical Optics*, 23(12), 120901.

# Keep your cells HEALTHY.



## Photobiology

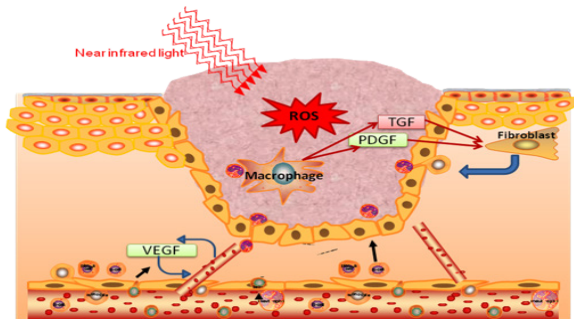
Photobiology is the study of the effects of non-ionized light sources on biological systems. The effect varies greatly depending on the parameters of the light source. The light source turns into a chemical biochemical substance in tissue cells.



## Enhancement in blood circulation

Blood vessels in healthy young people are elastic. However, as you get older, your blood vessels become less elastic. Therefore, improving blood circulation is the elasticity of capillaries. Cytochrome oxidase (cytochrome oxidase. CCO enzyme) produces NO through a specific parameter source. Nitrogen oxide (NO) produced in mitochondria of vascular endothelial cells improves vascular elasticity.

## PBM (Photobiomodulation) Wound Healing



Wounded cells exposed to light induce reactive oxygen species (ROS) in which leads to the growth factor expression, including platelet derived growth factor (PDGF) and transforming growth factor as shown in the image. This process fosters increased collagen synthesis, increased blood vessel development, and less inflammation. Such reactions enhances the wound healing.\*

\*Reference: Huang, Y. Y., Mroz, P & Hamblin, M. R. (2009). Basic Photomedicine. <http://www.photobiology.info/Photomed.html>.

# BAHI Therapy Immune Care Service

Latest medical field has immensely advanced in the field of emergency care, diagnosis, and surgery; however, there's still more room to grow in treating lifestyle diseases, such as high-blood pressure, diabetes, and cancers.

## **Are medical drugs prescribed for lifetime to treat lifestyle diseases the best treatment method?**

Drugs disturb and interfere with our body's natural healing program. Mammals excluding humans recover from the illness by resting without eating. All living things' DNAs have a natural healing program enclosed. Therefore, fundamental healing of all living things including human beings is to allow such natural healing program in our body to function well.



## **Our body is a system in which over 100 billion cells are interconnected.**

Hue Light's Immune Research Institute researches and develops the method of balancing cells in the body where the body is acknowledged as one systemic environment.

Hue Light's Care system has EVOLVED from clinically proven results of combining Whole-body Photobiomodulation Therapy, Molecular Hydrogen Inhalation Therapy, Hyperbaric Oxygen Therapy, and Wave Therapy. All of our treatments support the body's ability to naturally heal without any side effects.



# Recent PBM Therapy Studies

## Safety and efficacy of photobiomodulation therapy in oncology : A systematic review

René-Jean Bensadoun, et. al.

Center De Haute Energie; City of Hope

Cancer Med. 2020 Nov; 9(22): 8279–8300.

Published online 2020 Oct 26. doi: 10.1002/cam4.3582

## Medical Research Papers on other diseases

(Retrieved from NIH National Library of Medicine )

- **Parkinson's Disease:** Photobiomodulation for Parkinson's Disease in Animal Models: A Systematic Review
- **Neurodegeneration:** The Potential of Near Infrared Light Therapy in Alzheimer's and Parkinson's Disease.
- **Arthritis:** Photobiomodulation therapy on the inflammatory response induced by osteoarthritis
- **Brain Damage:** Near-infrared photonic energy penetration: can infrared phototherapy effectively reach the human brain?
- **Diabetic retinopathy:** Mitochondrial signal transduction in accelerated wound and retinal healing by near-infrared light therapy
- **Atopic dermatitis (Eczema):** Prospective, Randomized Study on the Efficacy and Safety of Local UV-Free Blue Light Treatment of Eczema
- **Heart Disease:** Near infrared light protects cardiomyocytes from hypoxia and reoxygenation injury by a nitric oxide dependent mechanism
- **Acute Herpes Zoster Ophthalmicus:** The Effects of 830 nm Light-Emitting Diode Therapy on Acute Herpes Zoster Ophthalmicus: a pilot study
- **Cerebral Stroke:** can infrared phototherapy effectively reach the human brain?
- **Depression:** Review of transcranial photobiomodulation for major depressive disorder: targeting brain metabolism, inflammation, oxidative stress, and neurogenesis
- **Post-surgical cognitive impairment :** Neuroprotective Effects Against POCD by Photobiomodulation: Evidence from Assembly/Disassembly of the Cytoskeleton
- **Enhancing wound healing :** Green light emitting diodes accelerate wound healing
- **Sports recovery :** review on light therapy for skeletal muscle contractile function and post-exercise recovery
- **Wrinkle care :** Efficacy and Safety of 660 nm and 411 to 777 nm Light-Emitting Devices for Treating Wrinkles





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