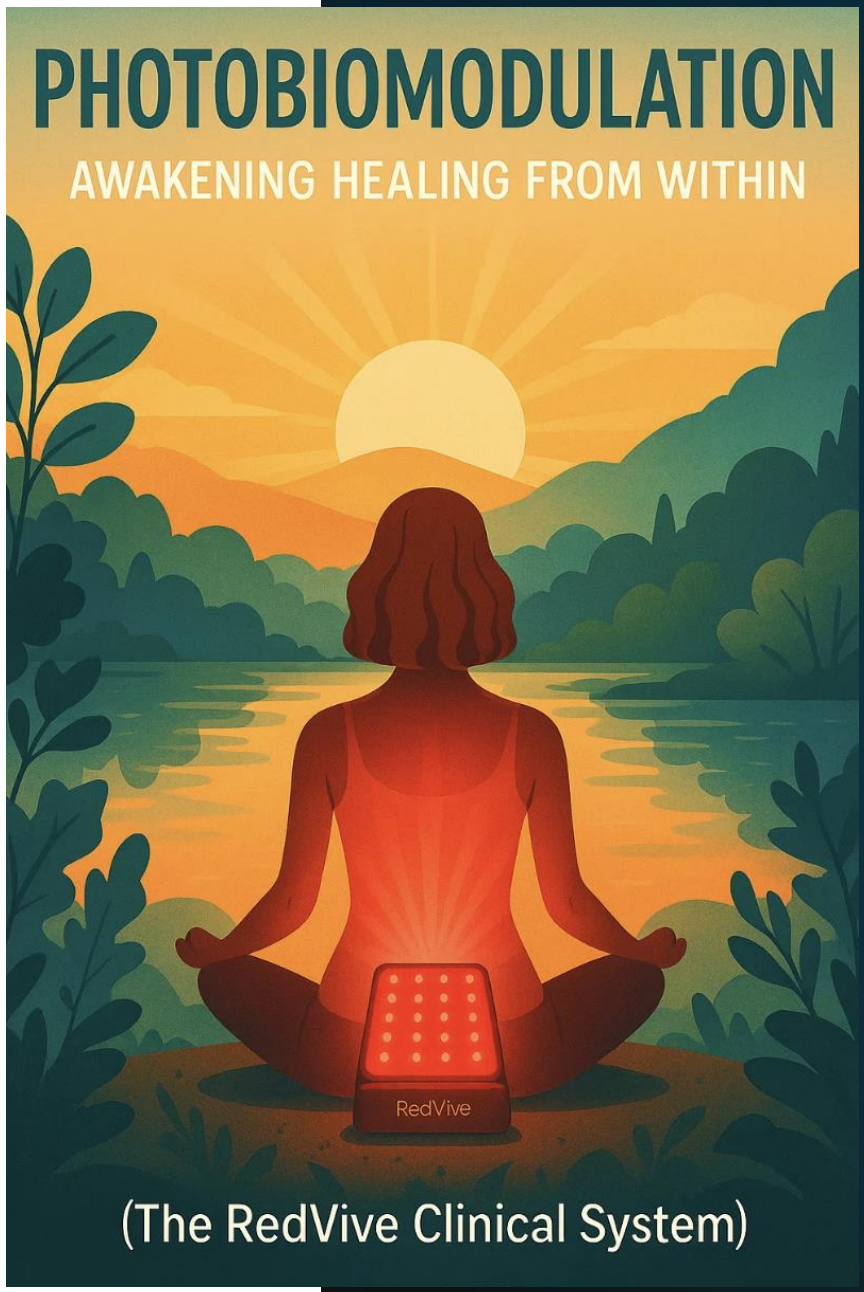
"The medicine of tomorrow isn’t swallowed — it’s ILLUMINATED."

-Rahul Desai, MD, RedVive Health



Horse Kick

From Clinic to Couch

Integrated PRE & POST procedure

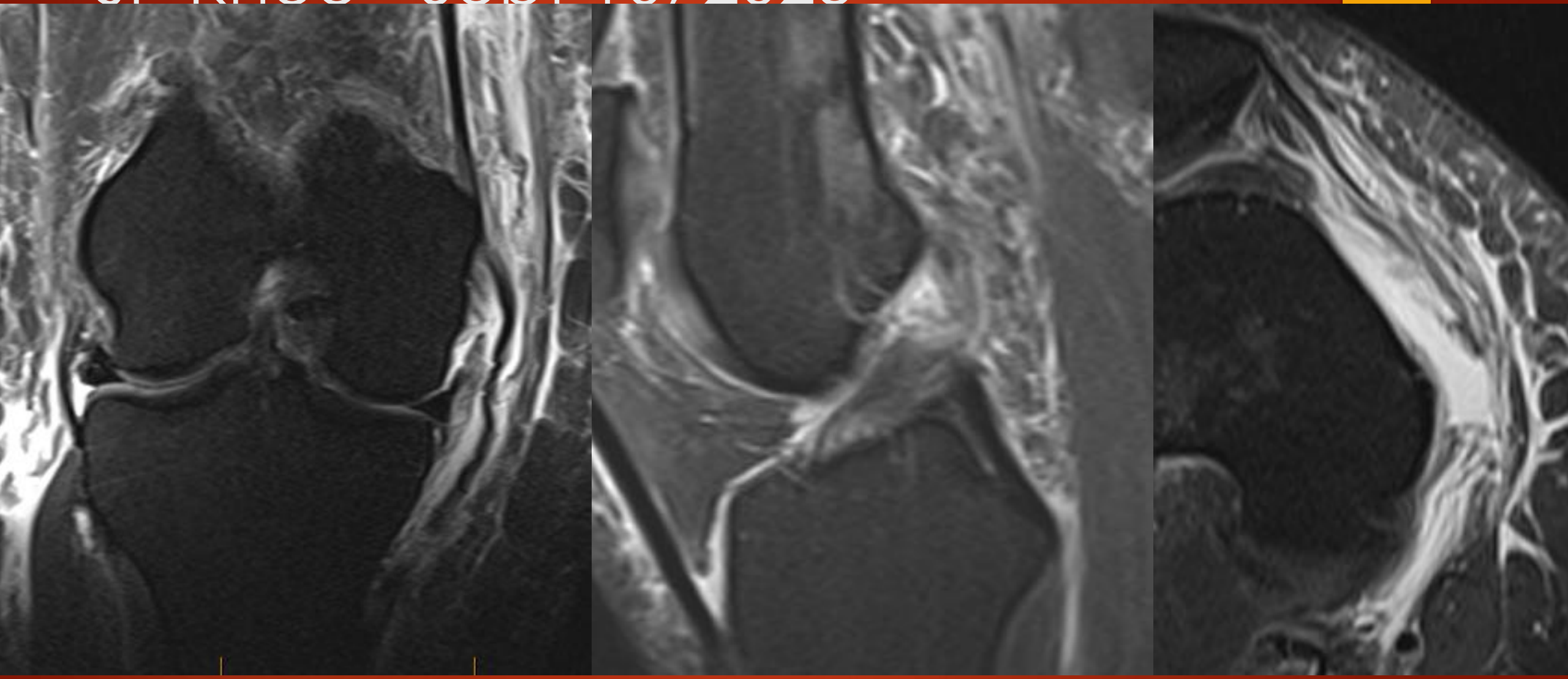
Daily Healing Homework

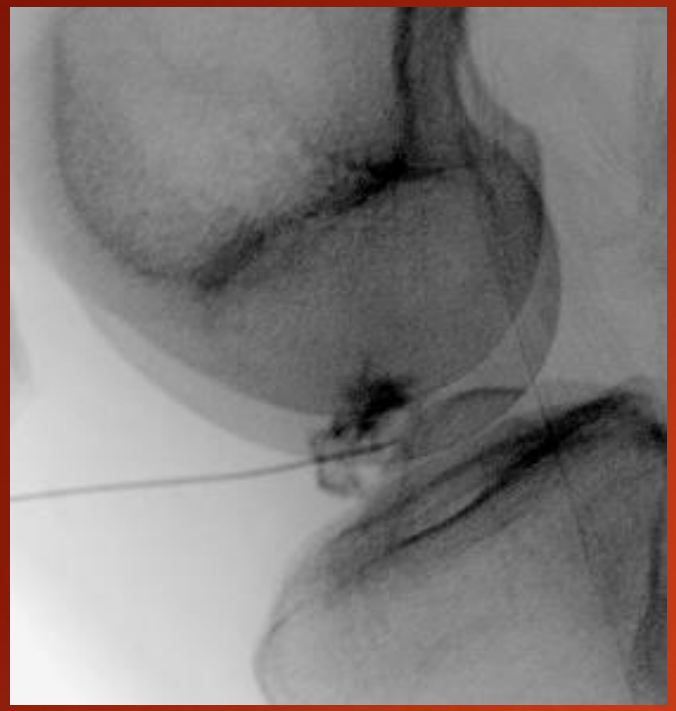
red:vive
Lighting Your Path To Wellness

RedVive 60

RedVive 300

JP Knee - Sept 10, 2023

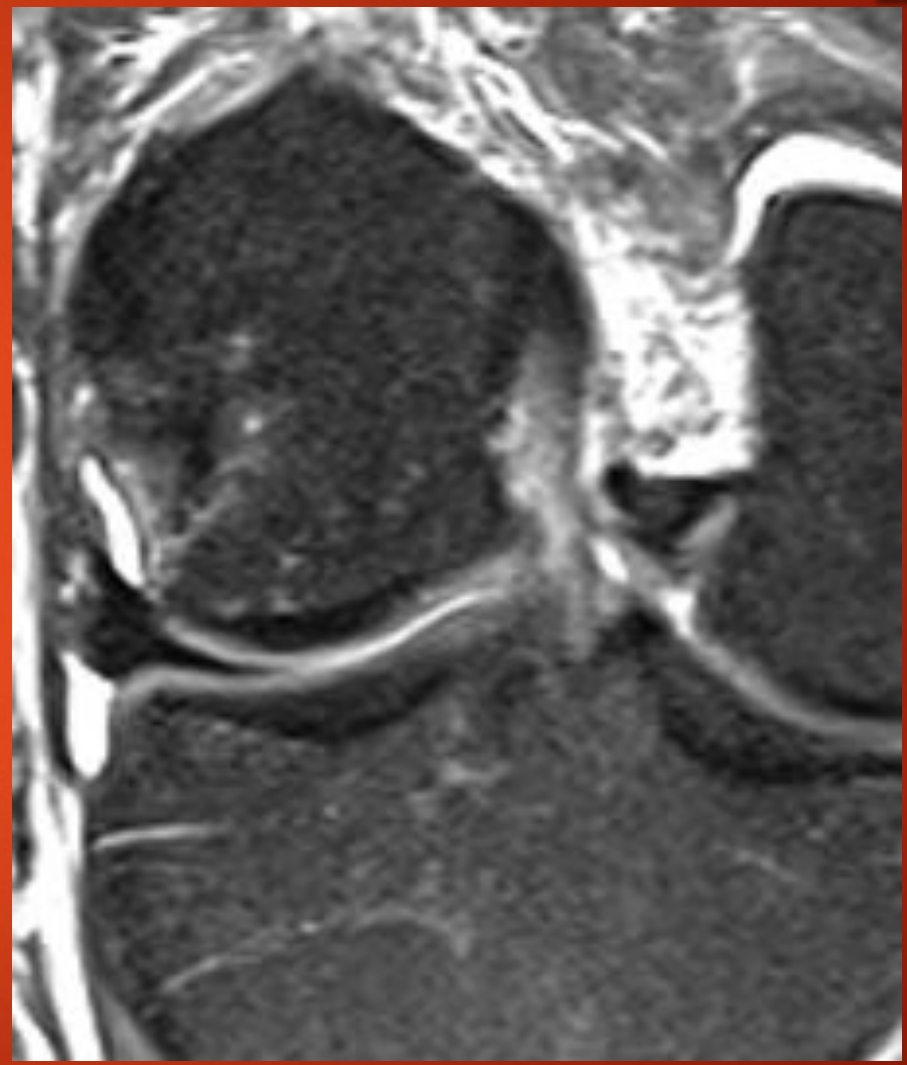




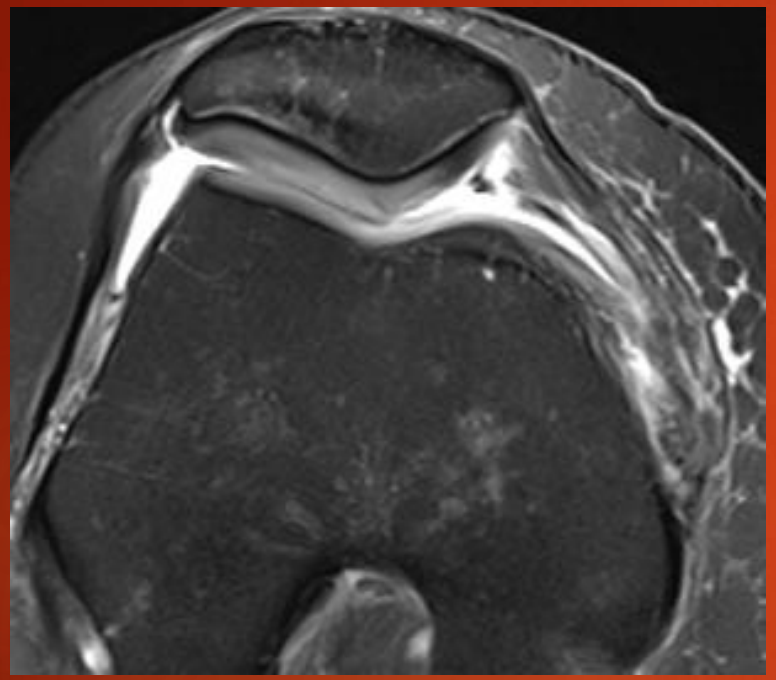

Oct 5, 23

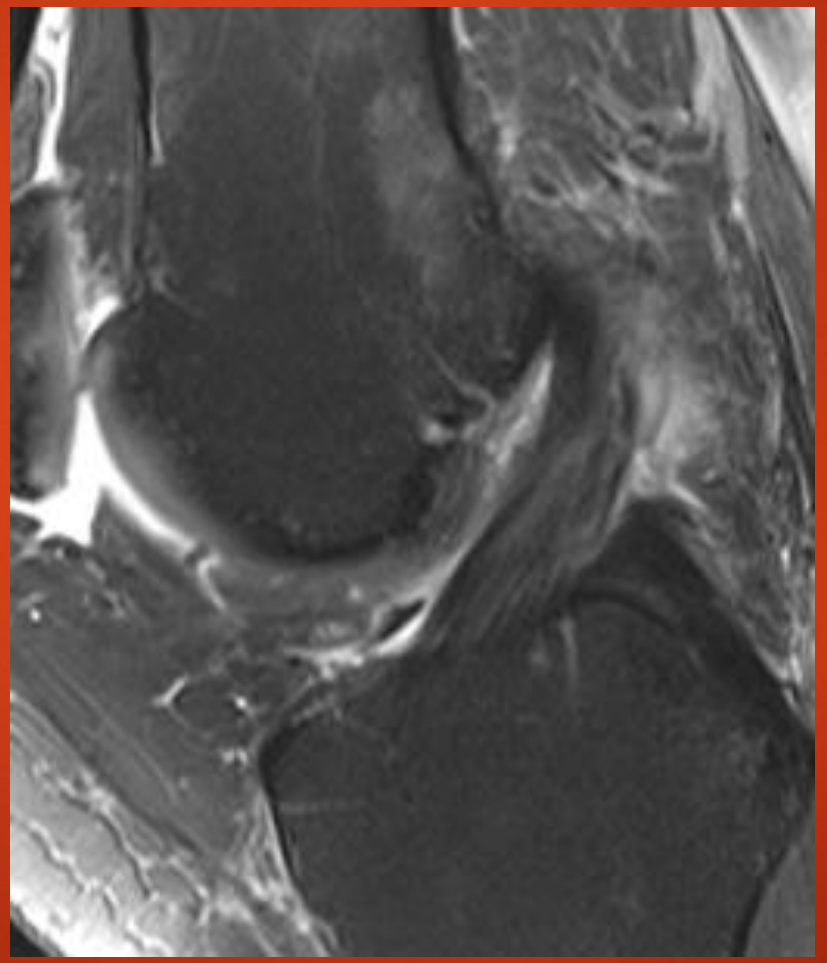


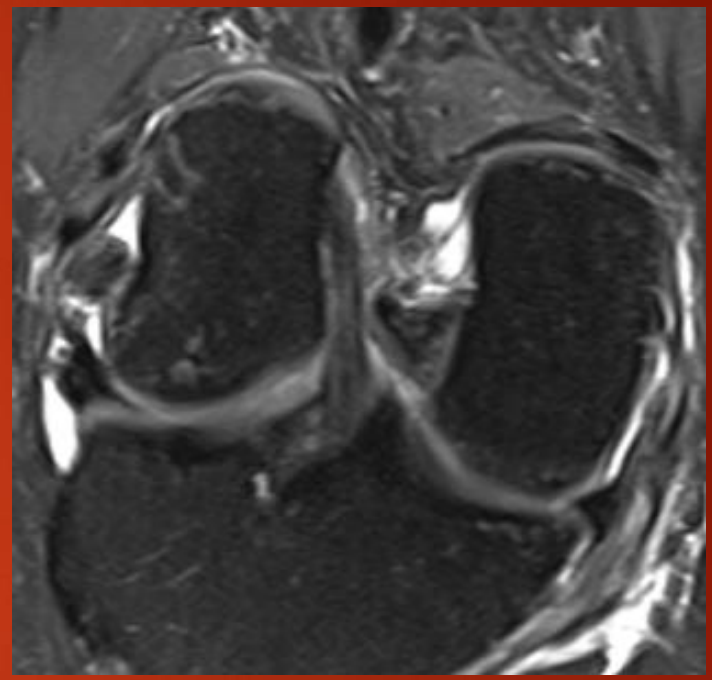
Nov 24, 2023



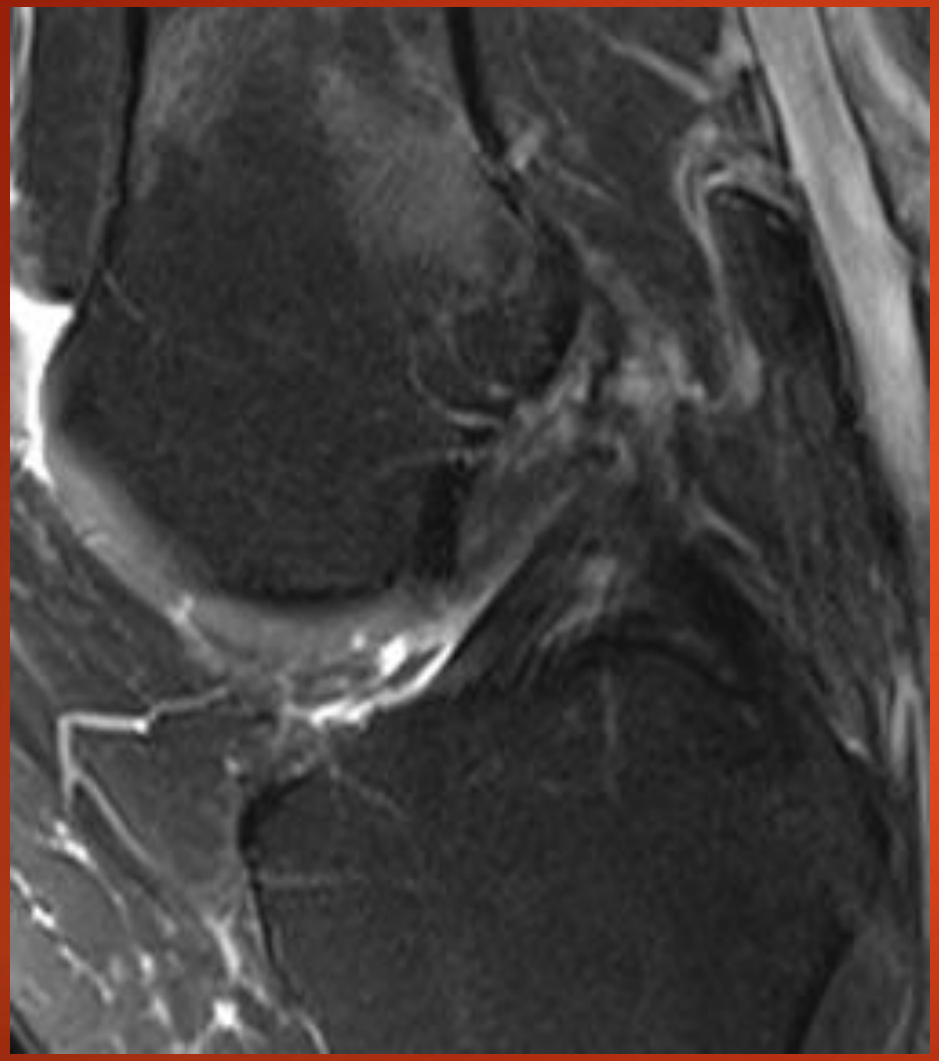
JP Knee – Dec 28, 2023

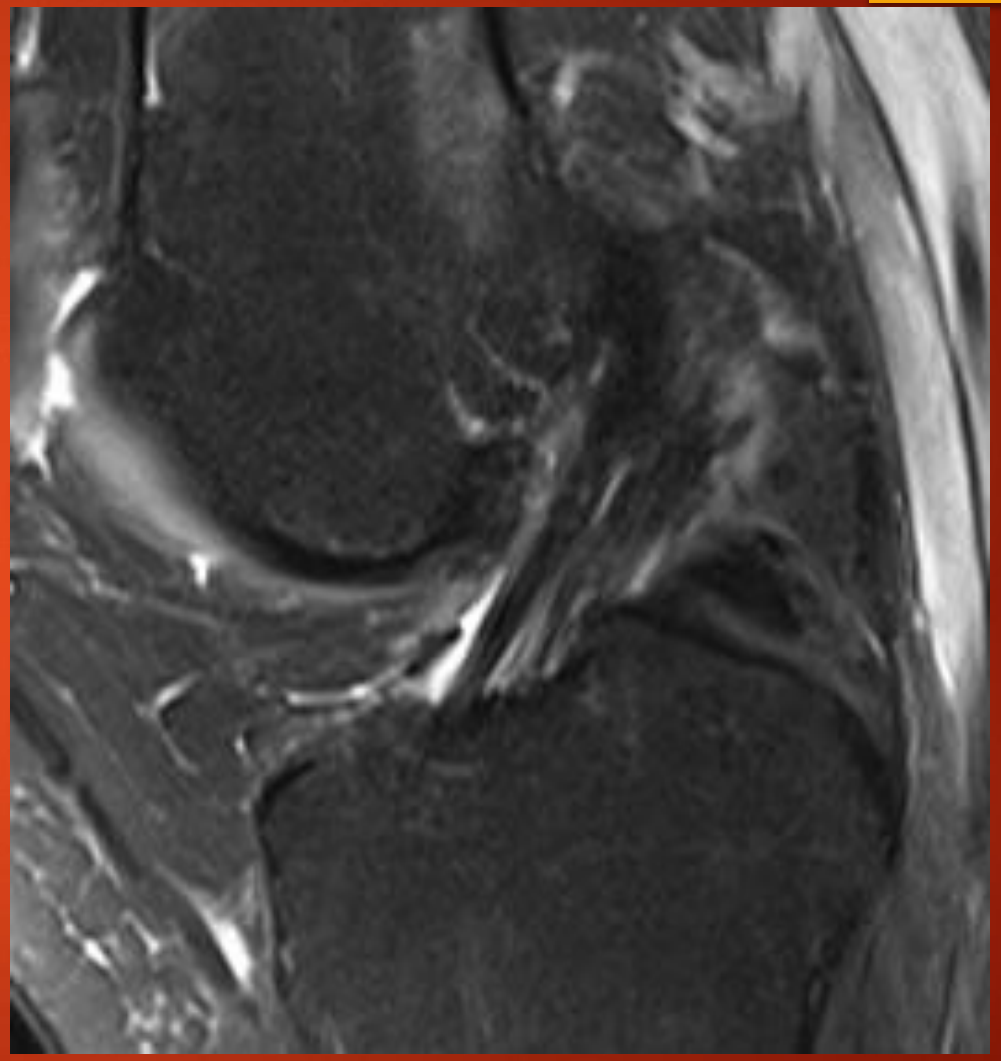




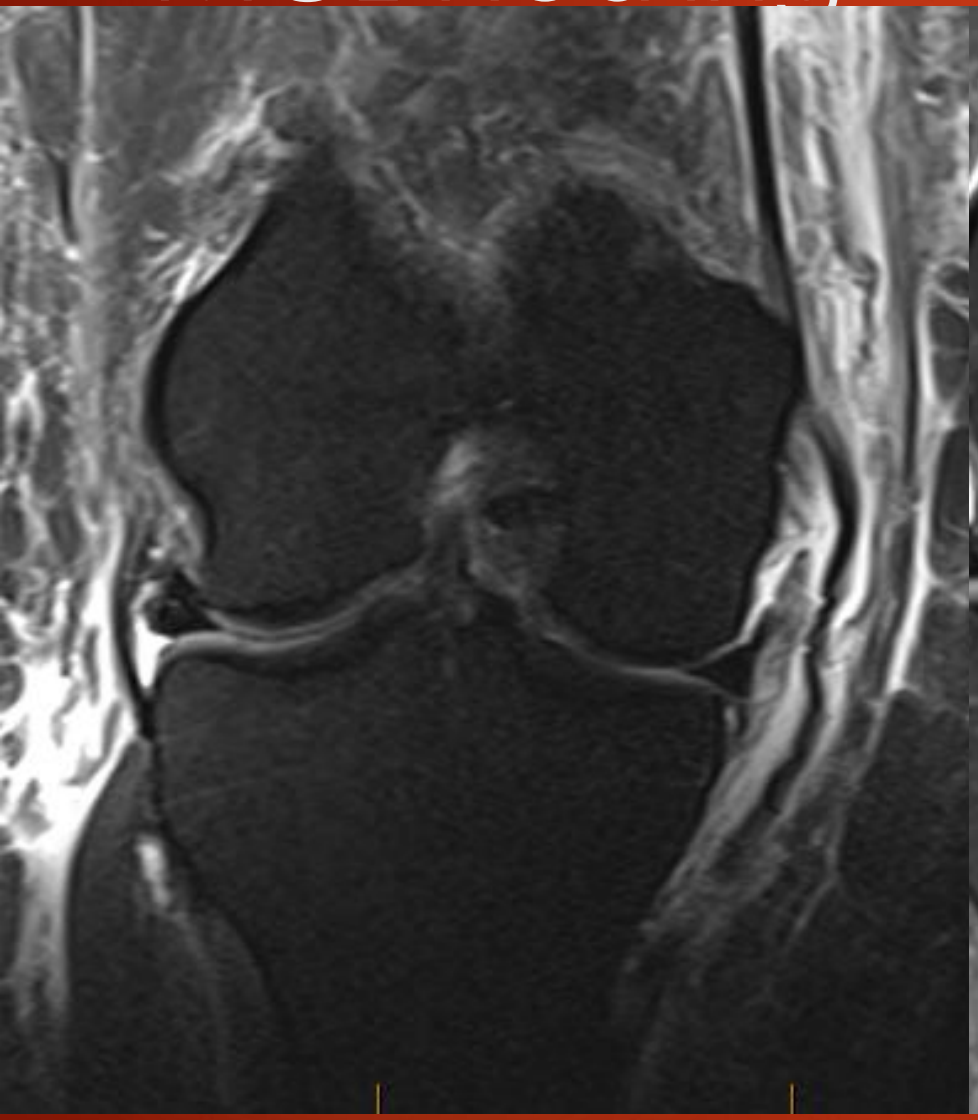


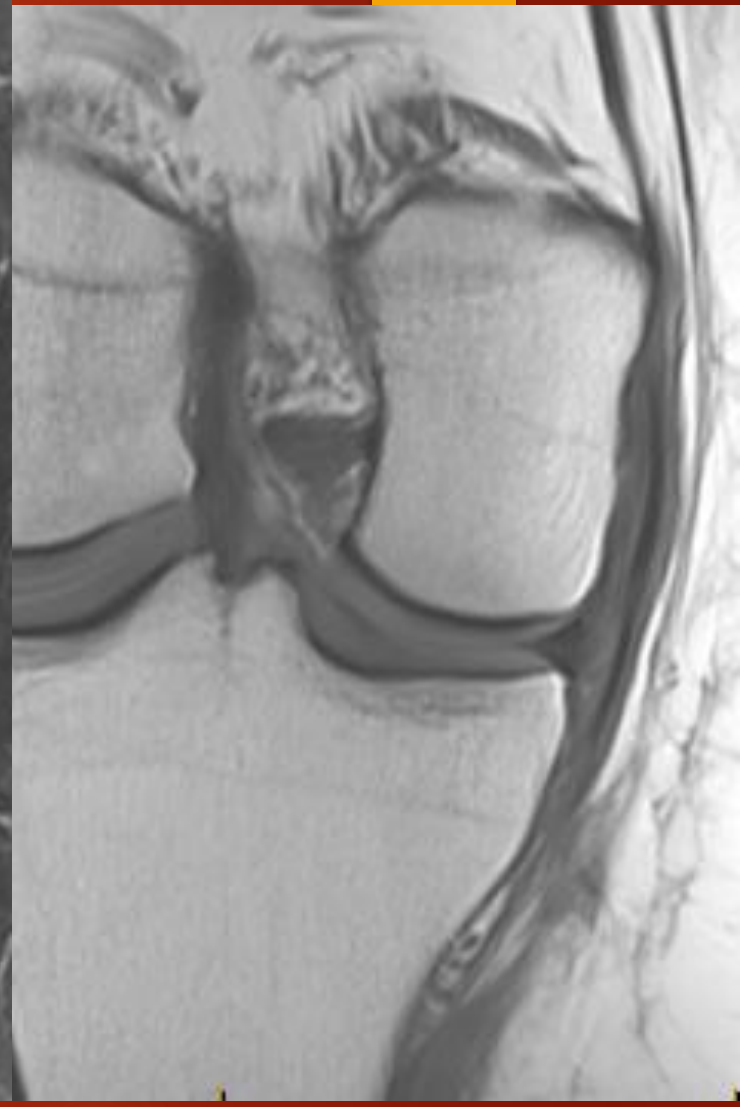
Healed ACL



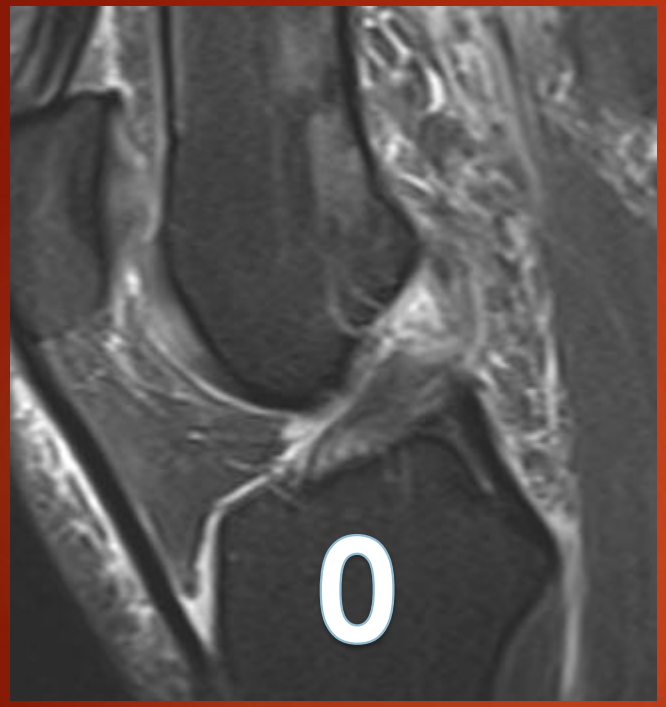


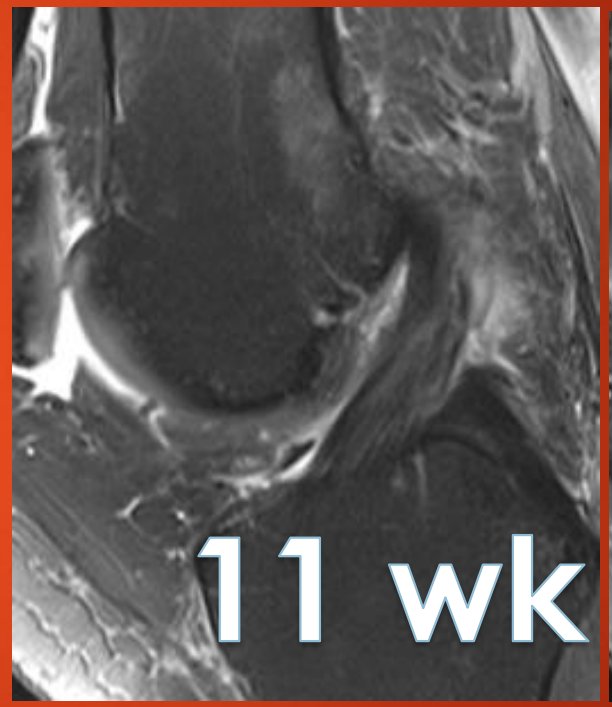
MCL Healing – 0,3,7 months

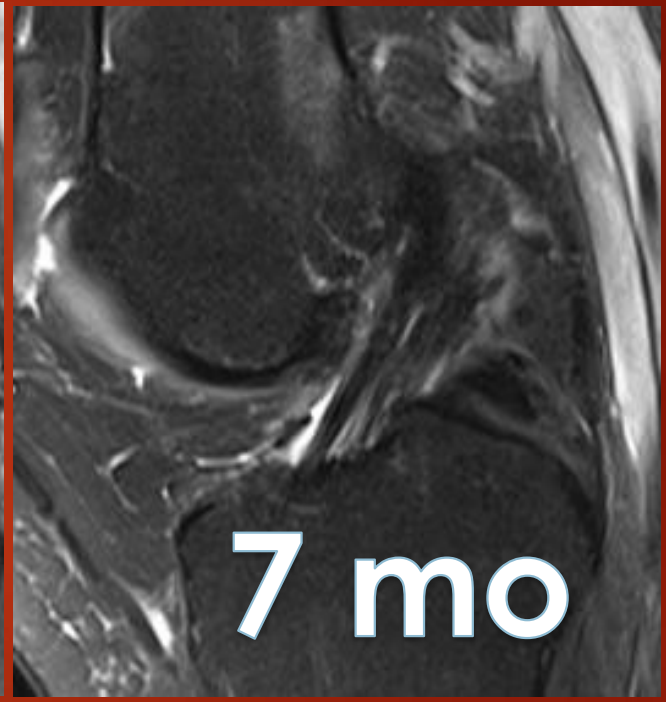


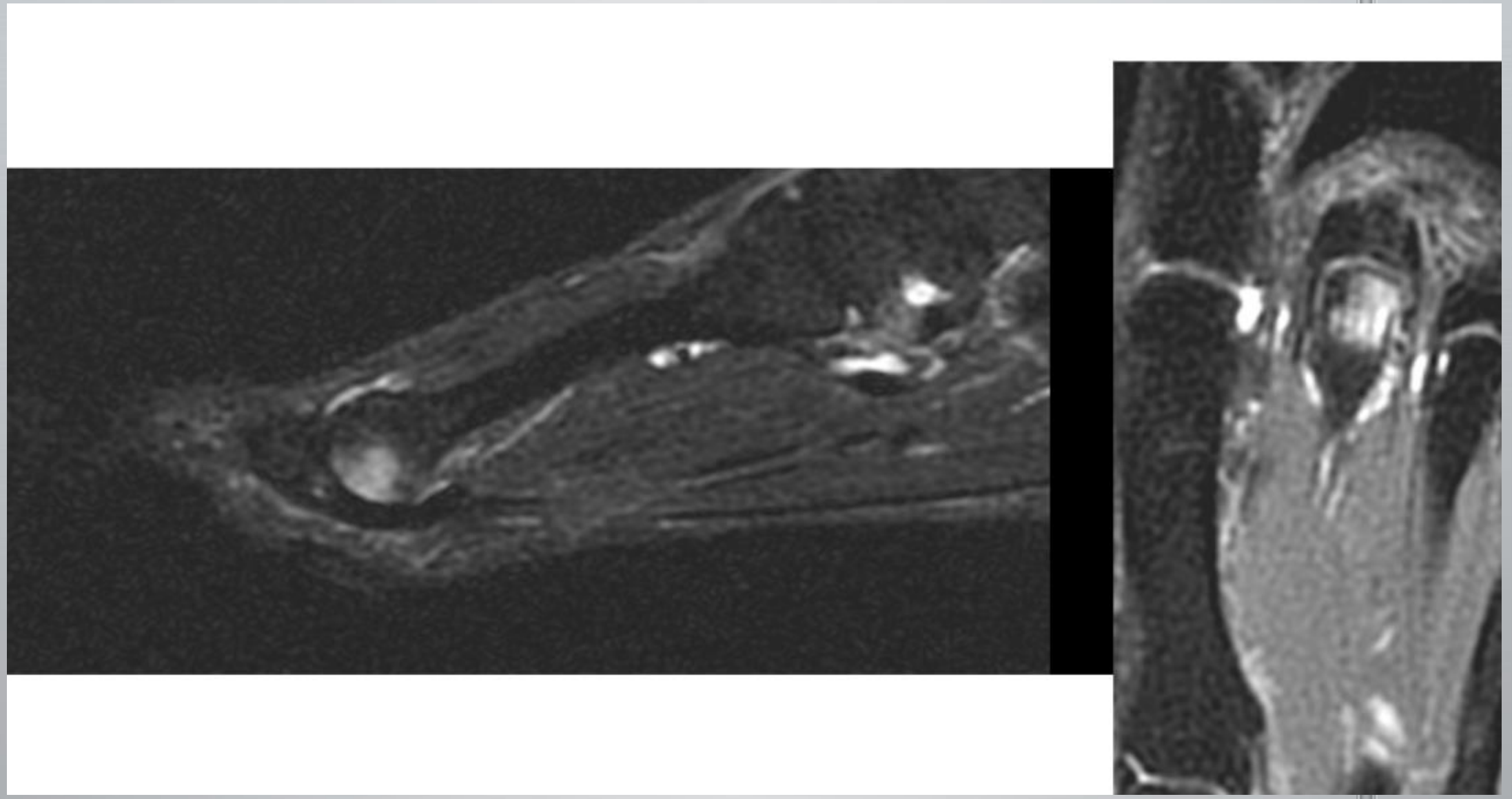


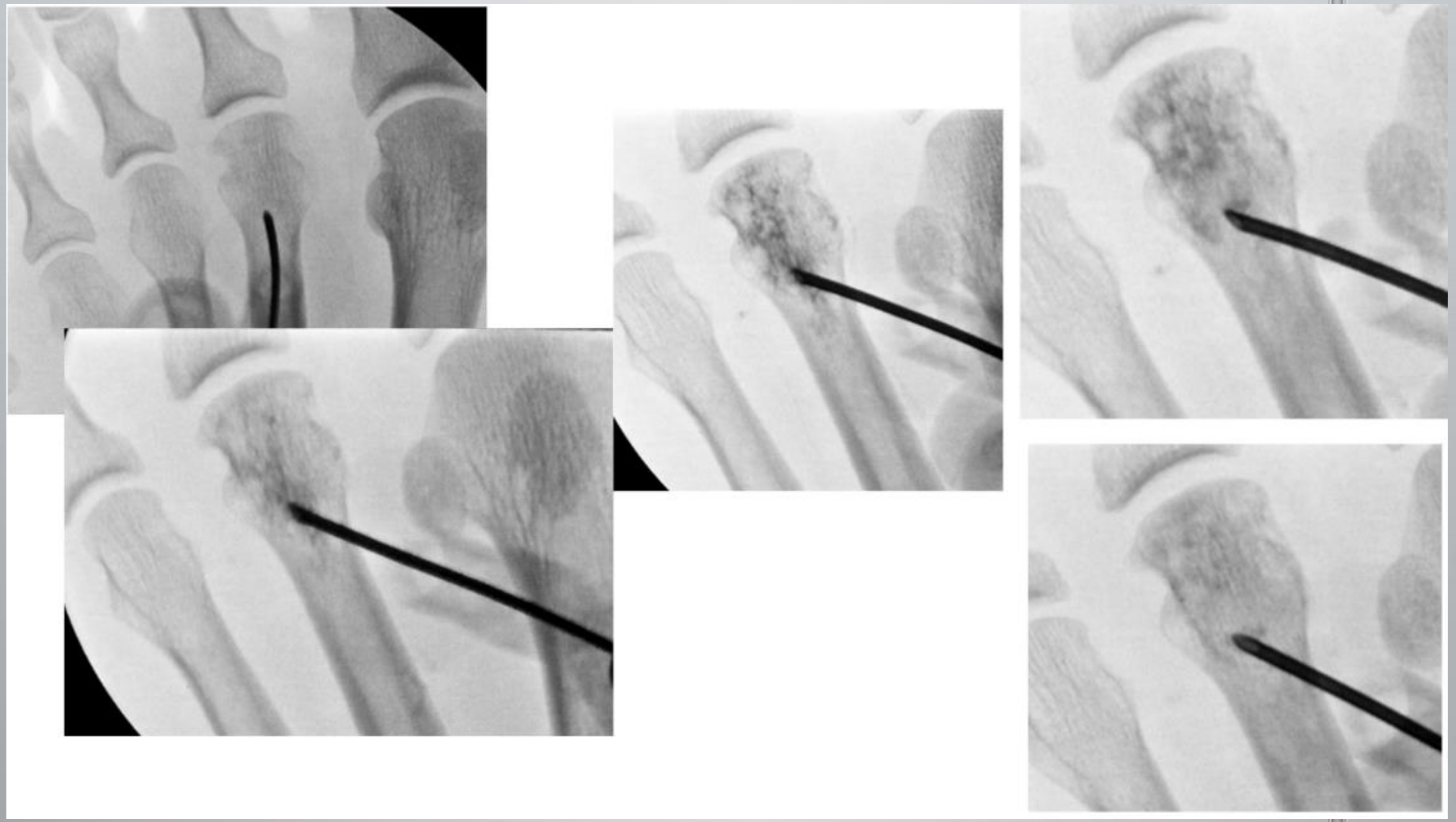
Progression of Healing











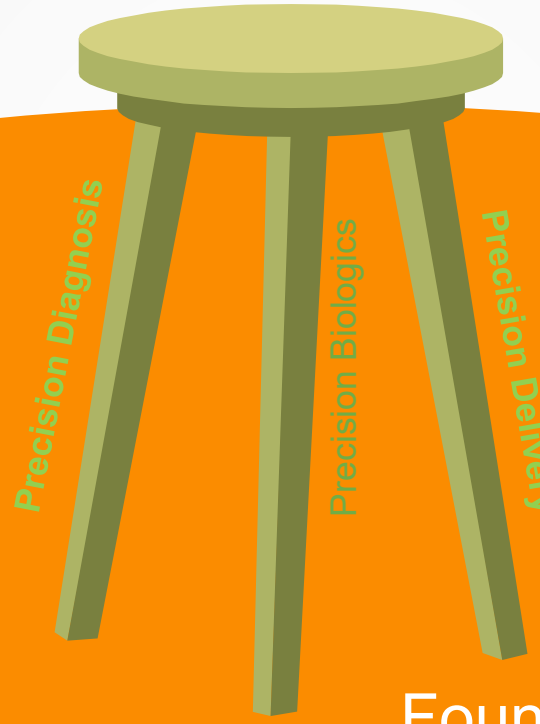
PHOTOBIOMODULATION IN ORTHOBIOLOGICS

Science, Simplicity, and Smart Integration

Rahul N. Desai, MD

Dr.desai@redvivehealth.org

Successful Regenerative Medicine Therapy



Precision Diagnosis

History, Physical Exam, Diagnostic Imaging & Injections

Precision Delivery

Image guided placement of needle/therapy into injured tissues

Precision Biologics

The best biologic for the injury or disease process

Foundation of Health

Foundational of Health

Wellness Habits

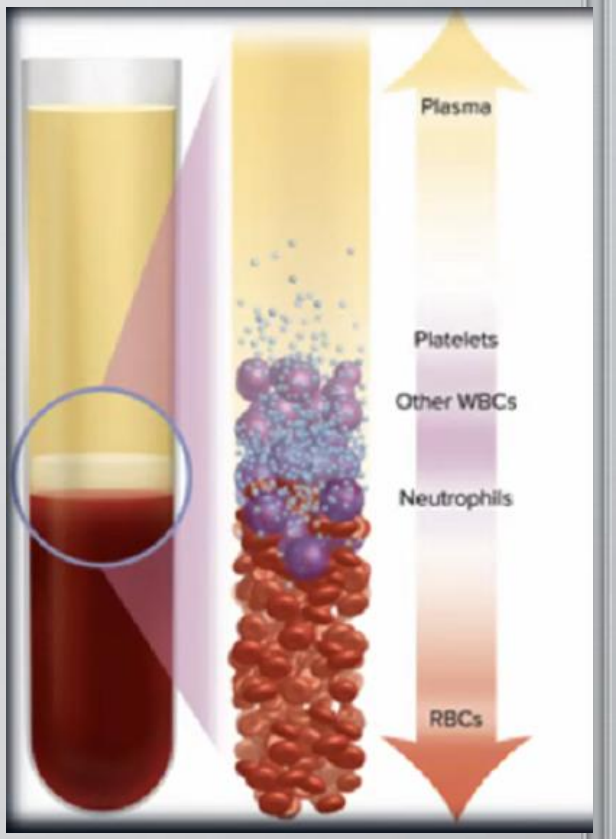
Energy Based Medicine

Functional Medicine and Hormones

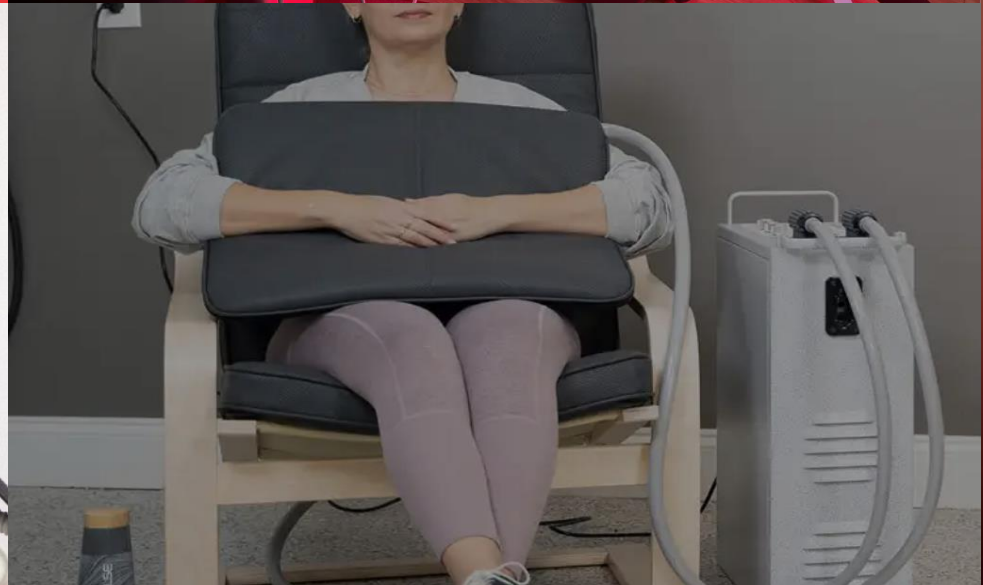
Mind and Spirit

Nutrition & Supplements


RestorePDX
Dr. Desai

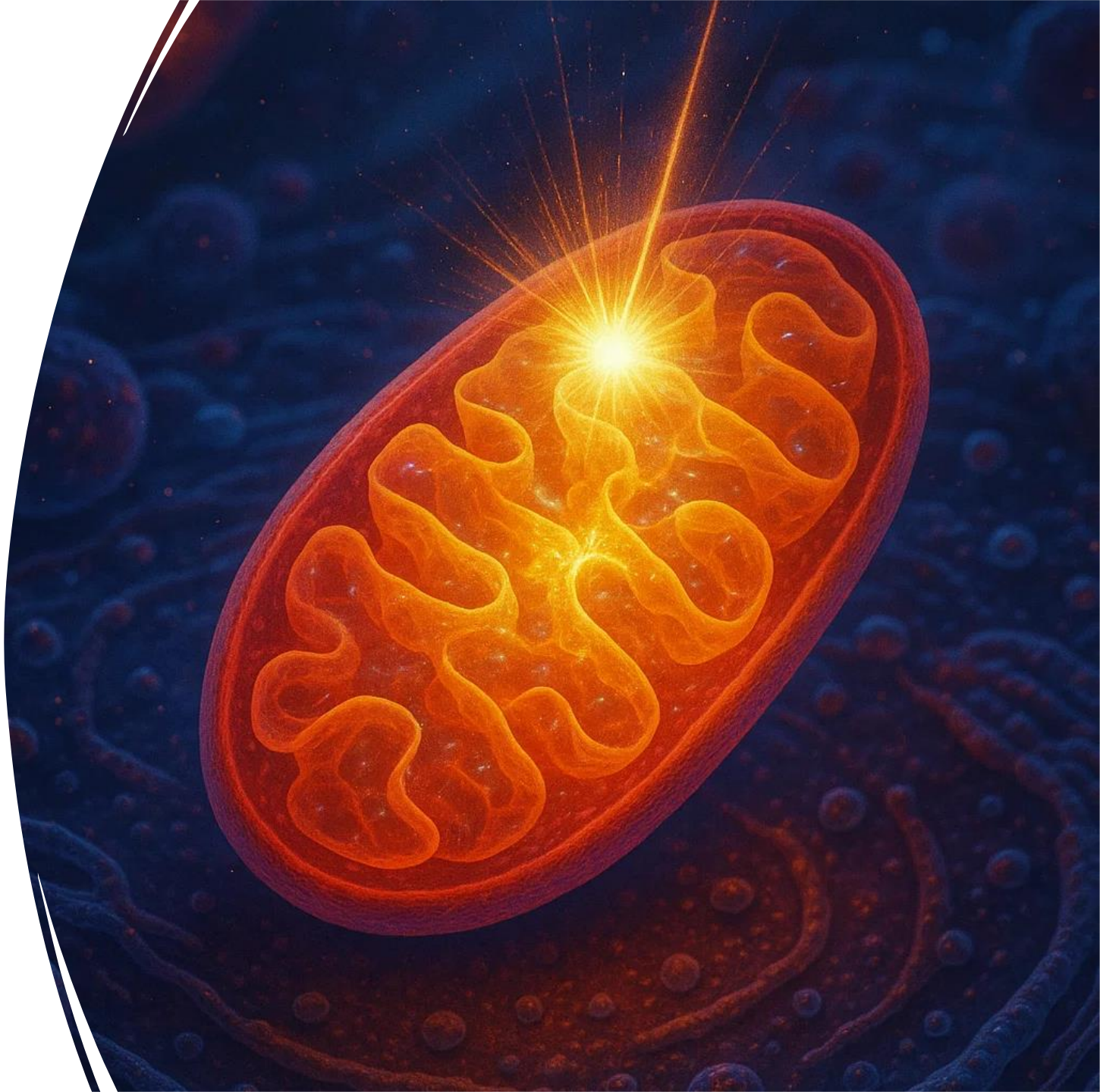

Plasma
Platelets
Other WBCs
Neutrophils
RBCs

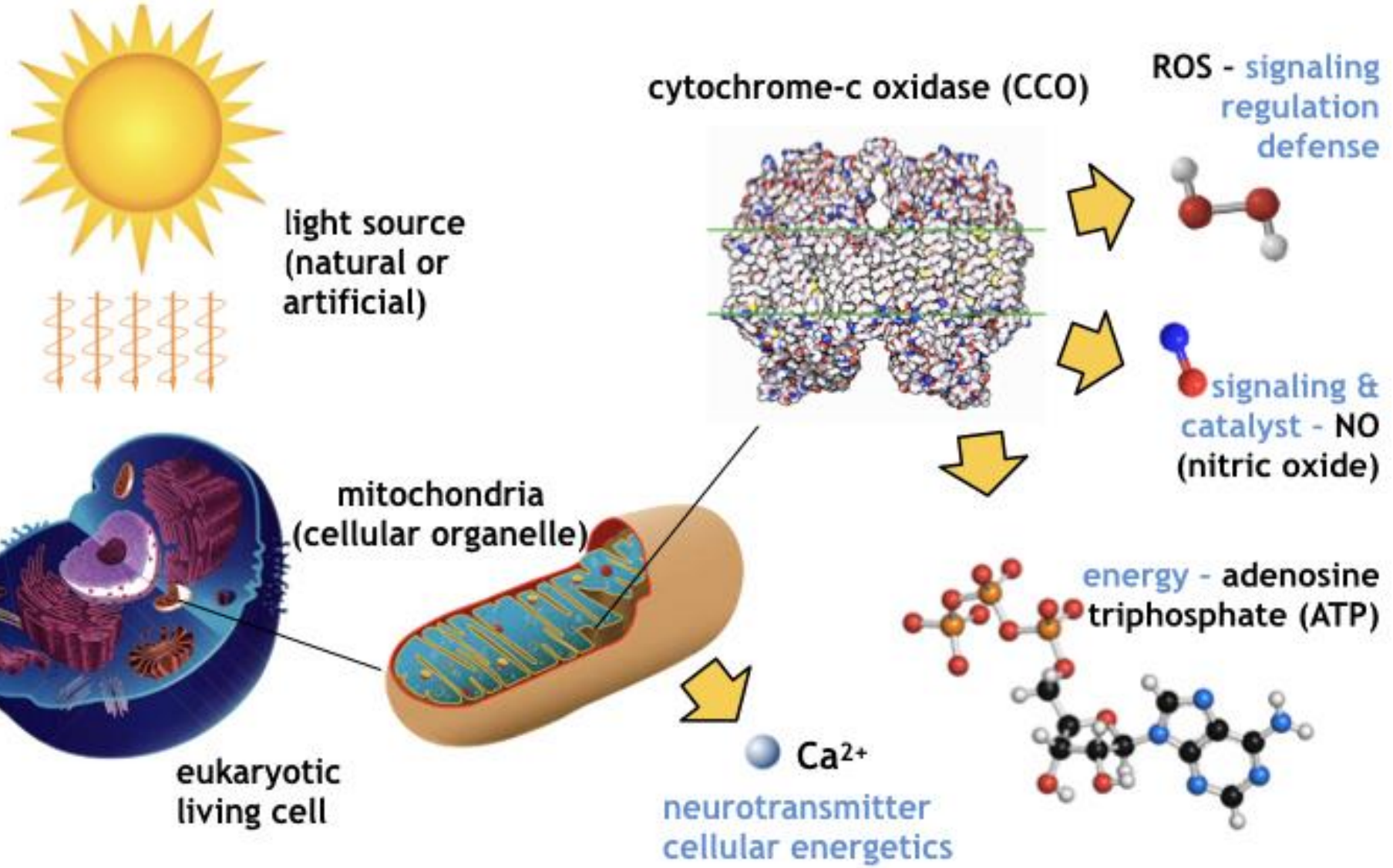
ENERGY BASED MEDICINE

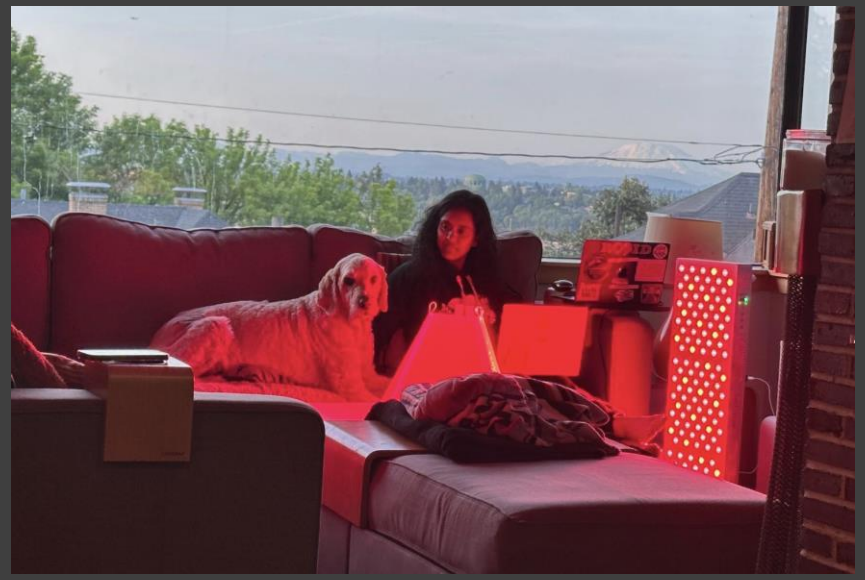


What is PBM? Photo-Bio-Modulation

- Uses specific wavelengths of red and near-infrared light (635, 670, 810, 850 nm)
- Stimulates the mitochondria (cellular power plants) to increase energy (ATP)
- Triggers natural healing, reduces inflammation, and enhances tissue repair




light source
(natural or
artificial)
cytochrome-c oxidase (CCO)
ROS - signaling
regulation
defense
signaling &
catalyst - NO
(nitric oxide)
mitochondria
(cellular organelle)
energy - adenosine
triphosphate (ATP)
eukaryotic
living cell
Ca2+
neurotransmitter
cellular energetics




1938

Photobiomodulation CME part I: Overview and mechanism of action

Jalal Maghfour, MD, MS,[a] David M. Ozog, MD,[a,b,c] Jessica Mineroff, BS,[d] Jared Jagdeo, MD, MS,[d] Indermeet Kohli, PhD,[b,c] and Henry W. Lim, MD[a,b,c]

Learning objectives
After completing this learning objective, the reader will be able to better discuss this aspect of the literature.

Disclosures
Editors
The editors involved with this CME activity have reported no relevant financial relationships with commercial interest(s).

Planners
The planners involved with this CME activity have reported no relevant financial relationships with commercial interest(s).

Reviewers
The reviewers involved with this CME activity have reported no relevant financial relationships with commercial interest(s).

Staff
The staff involved with this CME activity have reported no relevant financial relationships with commercial interest(s).

Photobiomodulation (PBM), previously known as low-level laser light therapy, represents a noninvasive form of phototherapy that utilizes wavelengths in the red light (RL, 620-700 nm) portion of the visible light (VL, 400-700 nm) spectrum and the near-infrared (NIR, 700-1440 nm) spectrum. PBM is a promising and increasingly used therapy for the treatment of various dermatologic and nondermatologic conditions. Photons from RL and NIR are absorbed by endogenous photoreceptors including mitochondrial cytochrome C oxidase (COX). Activation of COX leads to the following changes: modulation of mitochondrial adenosine triphosphate (ATP), generation of reactive oxygen species (ROS), and alterations in intracellular calcium levels. The associated modulation of ATP, ROS and calcium levels promotes the activation of various signaling pathways (eg, insulin-like growth factors, phosphoinositide 3-kinase pathways), which contribute to downstream effects on cellular proliferation, migration, and differentiation. Effective PBM therapy is dependent on treatment parameters (eg, fluence, treatment duration and output power). PBM is generally well-tolerated and safe with erythema being the most common and self-limiting adverse cutaneous effect. (J Am Acad Dermatol 2024;91:793-802.)

Key words: analgesic effects; anti-inflammatory effects; cold laser therapy; cytochrome c oxidase; LLLT; low-level light therapy; near infrared therapy; NIR; PBM; photobiomodulation; photostimulation; red light therapy; soft laser therapy; wound healing.

From the Department of Dermatology, Henry Ford Health, Detroit, Michigan[a]; The Henry W. Lim, MD, Division of Photobiology and Photomedicine, Department of Dermatology, Henry Ford Health, Detroit, Michigan[b]; College of Human Medicine, Michigan State University, East Lansing, Michigan[c]; and Department of Dermatology, State University of New York, Downstate Health Sciences University, Brooklyn, New York.[d]

Funding sources: None.
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IRB approval status: Not applicable.
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Correspondence to: David M. Ozog, MD, Department of Dermatology, Henry Ford Health, 3031 W. Grand Boulevard, Detroit, MI 48202. E-mail: dozog1@hfhs.org.

0190-9622/$36.00

https://doi.org/10.1016/j.jaad.2023.10.073
Date of release: November 2024.
Expiration date: November 2027.

Scanning this QR code will direct you to the CME quiz in the American Academy of Dermatology's (AAD) online learning center where after taking the quiz and successfully passing it, you may claim *1 AMA PRA Category 1 credit*. NOTE: You must have an AAD account and be signed in on your device in order to be directed to the CME quiz. If you do not have an AAD account, you will need to create one. To create an AAD account: go to the AAD's website: www.aad.org.

Apperance of area treated by red LLLT side at base line (a), after 6 weeks (b), and after 10 weeks (c)

Aziz-Jalali MH, Tabaie SM, Djavid GE. Comparison of Red and Infrared Low-level Laser Therapy in the Treatment of Acne Vulgaris. Indian J Dermatol. 2012 Mar;57(2):128-30. doi: 10.4103/0019-5154.94283. PMID: 22615511; PMCID: PMC3352636.

Crows Feet

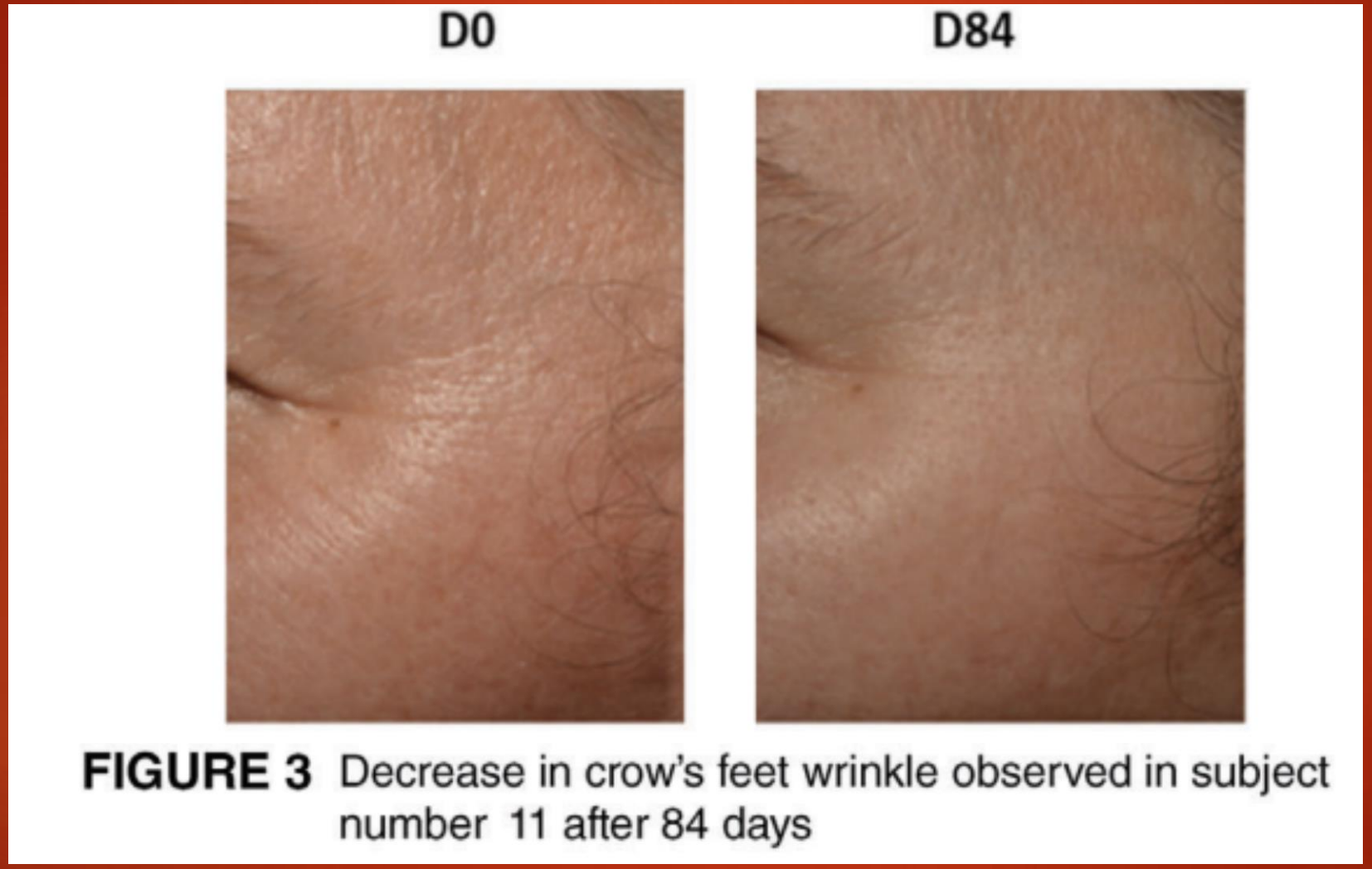
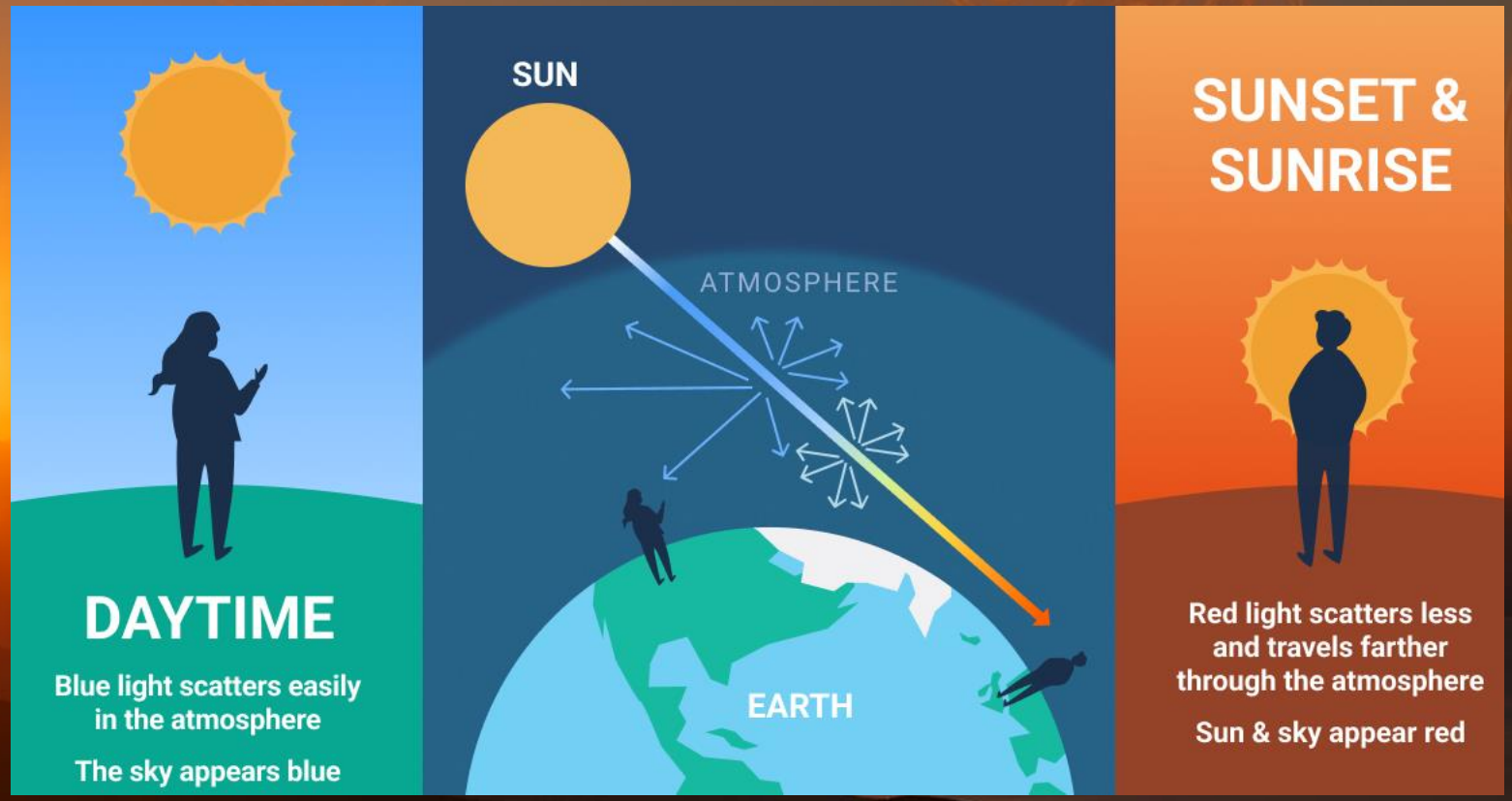


FIGURE 3 Decrease in crow's feet wrinkle observed in subject number 11 after 84 days

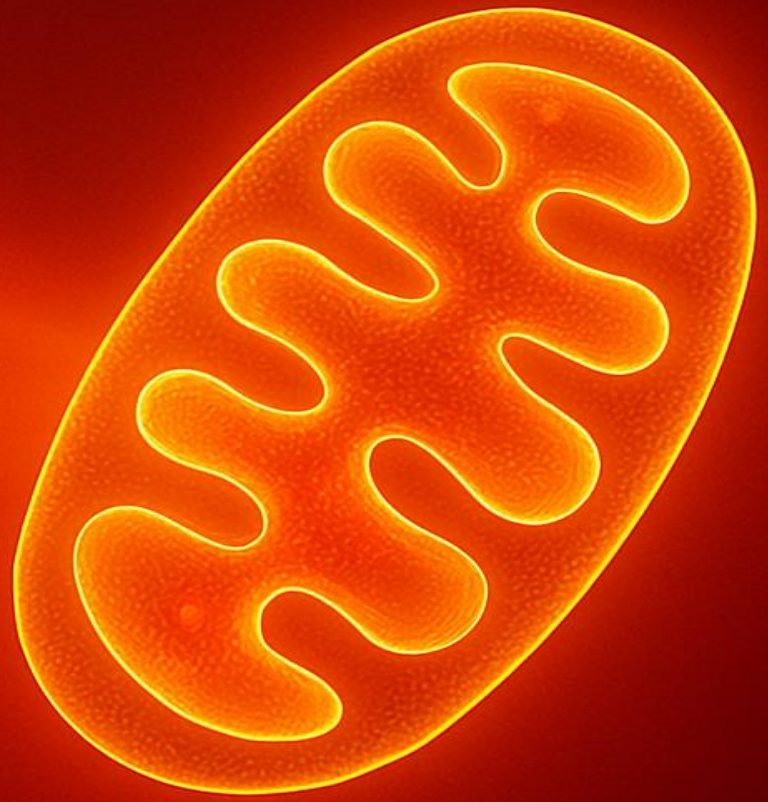
FIGURE 5 Decrease in pore size observed in subject number 4 after 28 days.

Pore Size Reduction

Photobiomodulation From Dawn to DNA

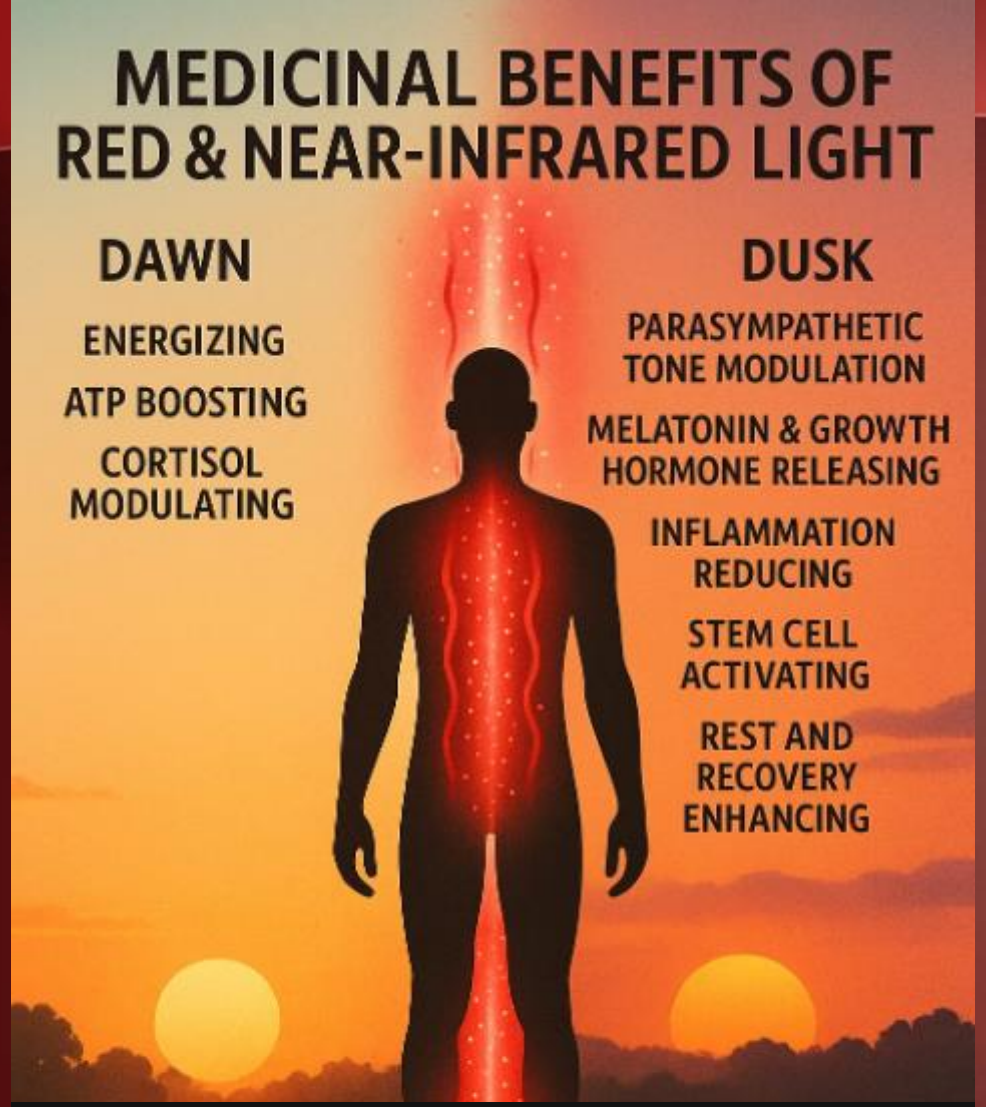


THE LIGHT SWITCH FOR REGENERATION



PHOTONS → MITOCHONDRIA → REPAIR

MEDICINAL BENEFITS OF RED & NEAR-INFRARED LIGHT



red:vive

Lighting Your Path To Wellness

EVOLUTIONARY BIOLOGY AND ANCIENT CELLULAR KNOWLEDGE

ATP Production Red Light 8-11 am

J Biophotonics. 2022 Oct;15(10):e202200093. doi: 10.1002/jbio.202200093. Epub 2022 Aug 4.

Shifting patterns of cellular energy production (adenosine triphosphate) over the day and key timings for the effect of optical manipulation

Harpreet Shinhmar [1], Jaimie Hoh Kam [1], John Mitrofanis [1 2], Chris Hogg [1], Glen Jeffery [1]

Affiliations + expand

PMID: 35860879 DOI: 10.1002/jbio.202200093

Abstract

Mitochondria are optically responsive organelles producing energy for cell function via adenosine triphosphate (ATP). But ATP production appears to vary over the day. Here we use Drosophila melanogaster to reveal daily shifts in whole animal ATP production in a tight 24 hours' time series. We show a marked production peak in the morning that declines around midday and remains low through afternoon and night. ATP production can be improved with long wavelengths (>660 nm), but apparently not at all times. Hence, we treated flies with 670 nm light to reveal optimum times. Exposures at 670 nm resulted in a significant ATP increases and a shift in the ATP/adenosine diphosphate (ADP) ratio at 8.00 and 11.00, whilst application at other time points had no effect. Hence, light-induced ATP increases appear limited to periods when natural production is high. In summary, long wavelength influences on mitochondria are conserved across species from fly to human. Determining times for their administration to improve function in ageing and disease are of key importance. This study progresses this problem.

Keywords: ATP; metabolism; mitochondria; near infrared light; photobiomodulation.

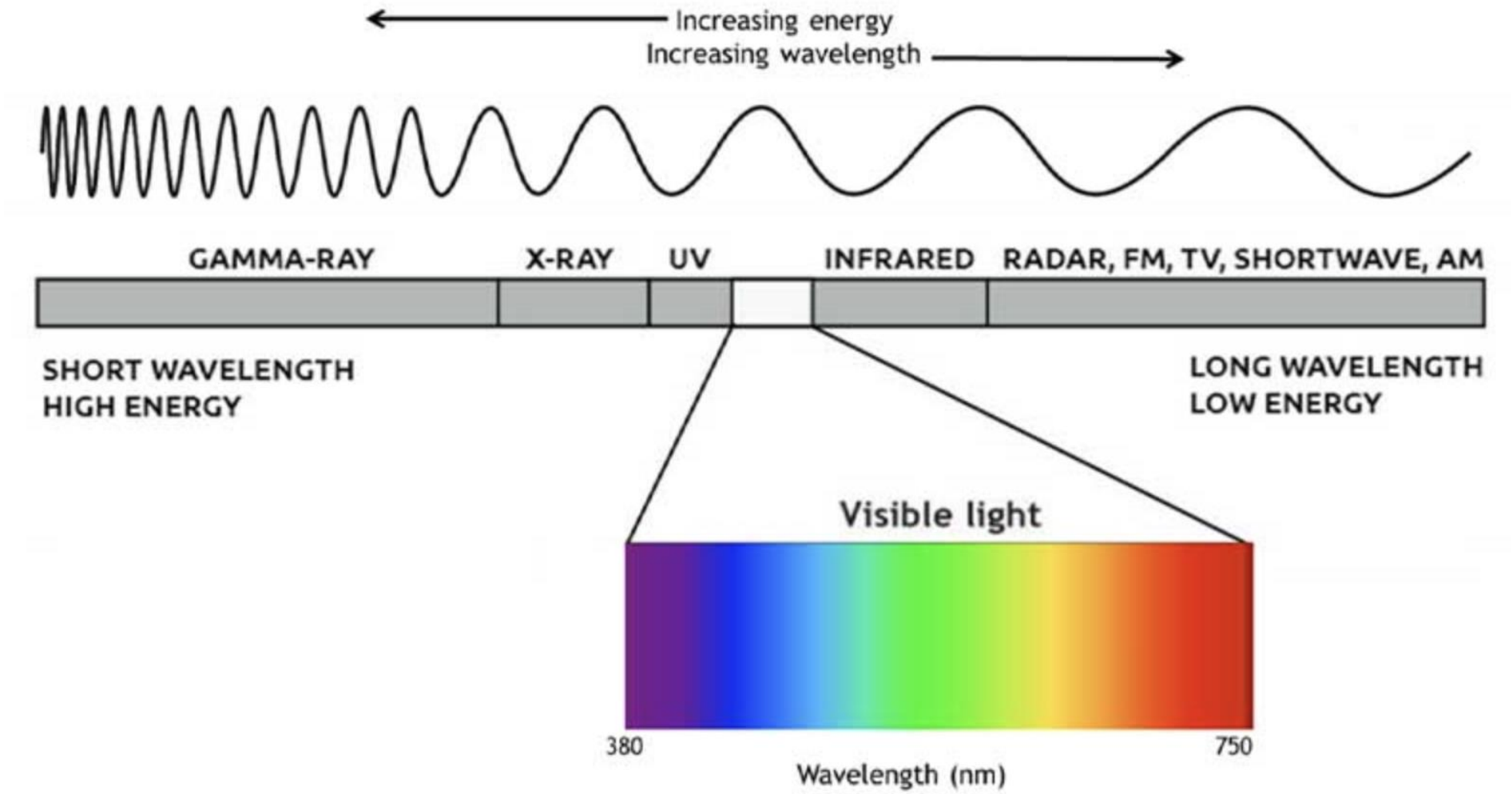
Why Supplement with Light

LESS NATURAL LIGHT

BIOLOGIC ADAPTATION

HEALING & TISSUE REPAIR

INFLAMMATION MODULATION


Increasing energy
Increasing wavelength
GAMMA-RAY
X-RAY
UV
INFRARED
RADAR, FM, TV, SHORTWAVE, AM
SHORT WAVELENGTH
HIGH ENERGY
LONG WAVELENGTH
LOW ENERGY
Visible light
380
750
Wavelength (nm)

UV VS INFRARED SPECTRA

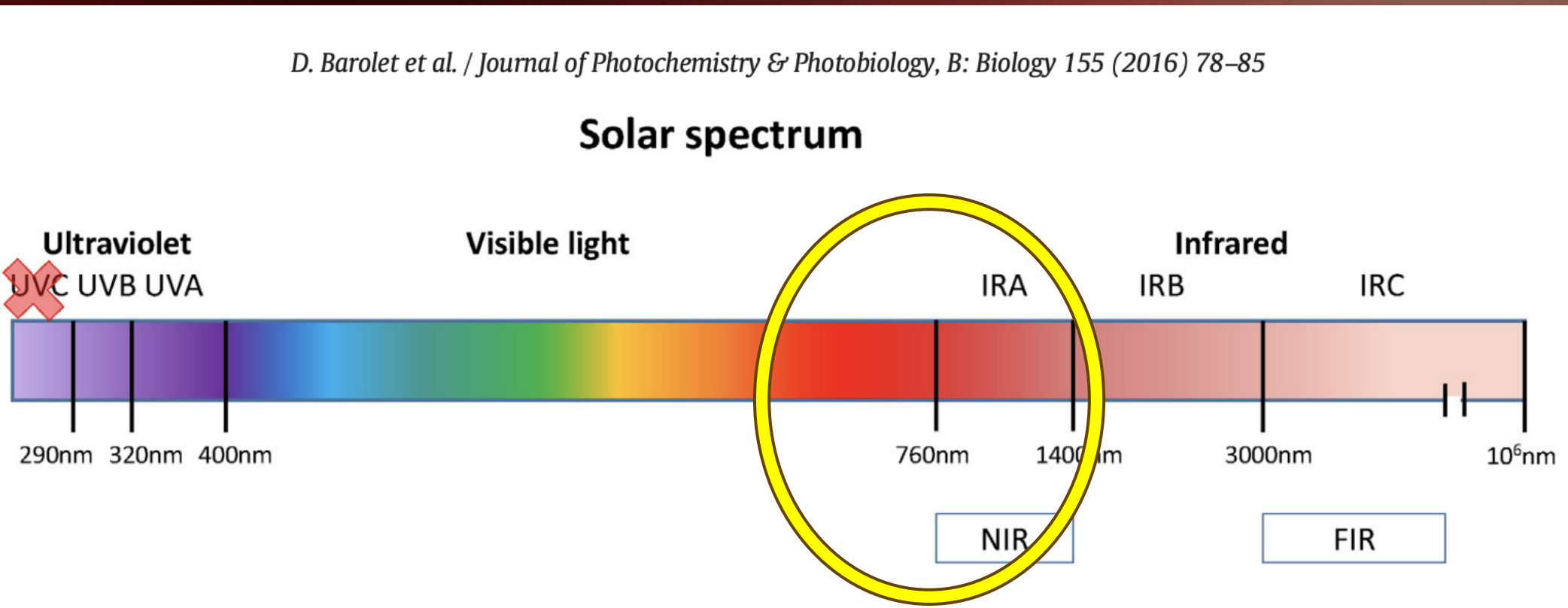


Fig. 1. Solar spectrum composition. Red X over UVC means that they are blocked by the ozone layer (NIR: near infrared, FIR: far infrared).


RedVive
CELLULAR REJUVENATION
635nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
670nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
810nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
850nm
1 fl. oz. (30 ml)

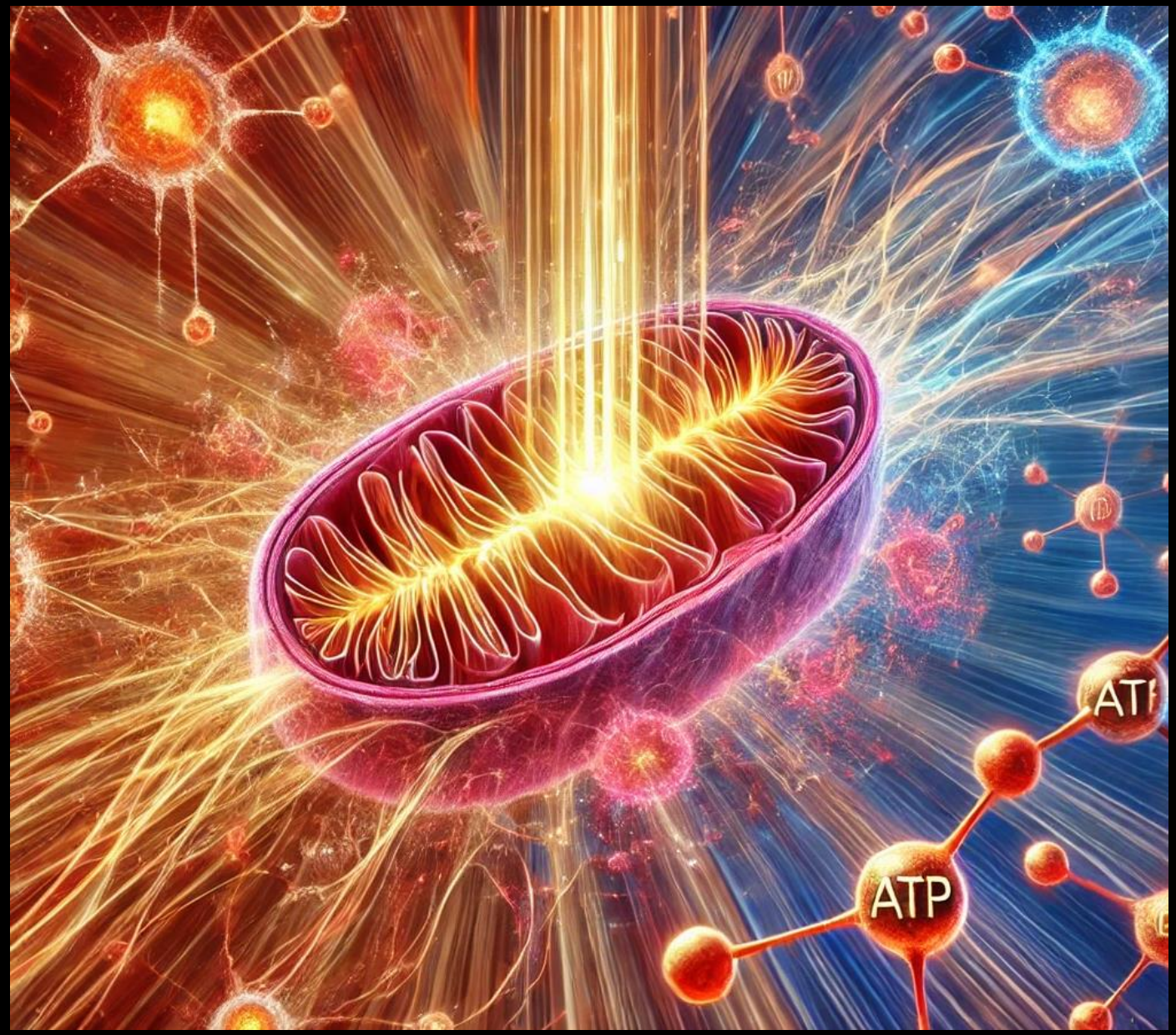


PHOTO-BIO-MODULATION (MESH -2015-2016)

Low Level Light Therapy (LLLT)

Low Intensity Light Therapy (LILT)

Phototherapy

Photobiostimulation

Biostimulation (BIOS)

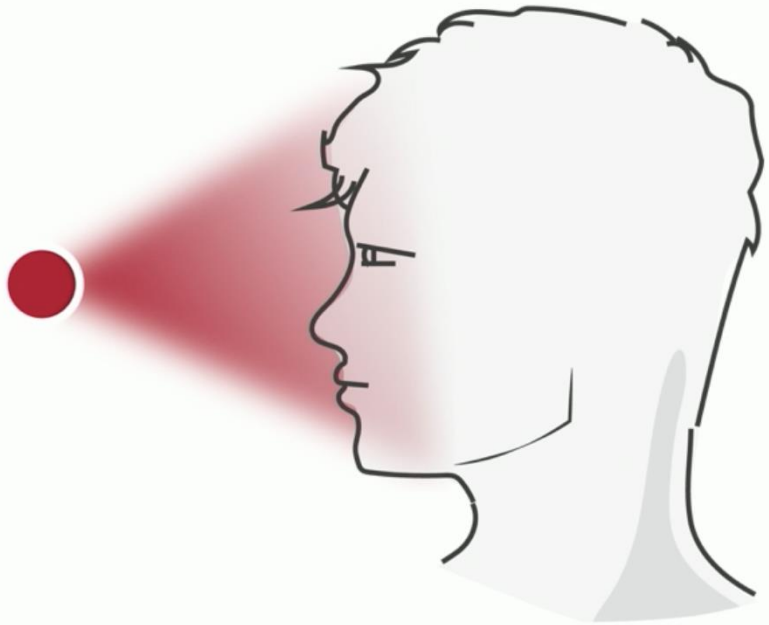
Photonic Stimulation

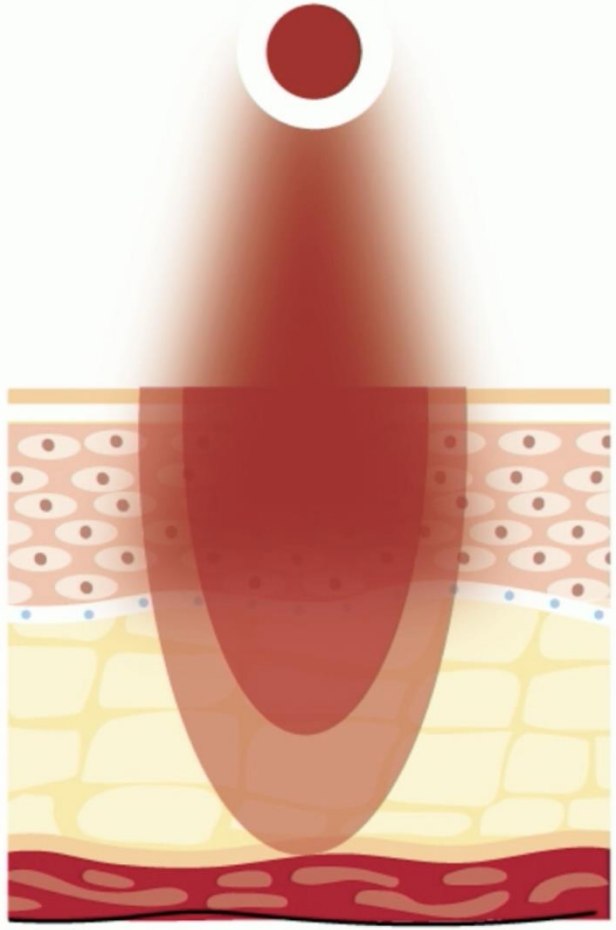
Photomedicine

Cold Laser Therapy

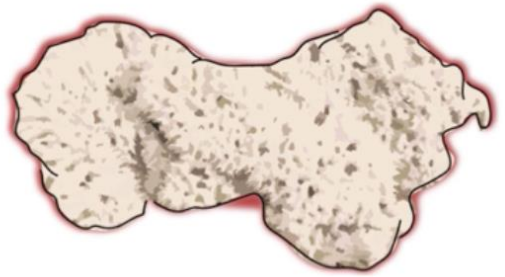
Class 3-4 Laser Therapy

2 pathways for RLT in our body





Skin's Chromophores - Light Sponges

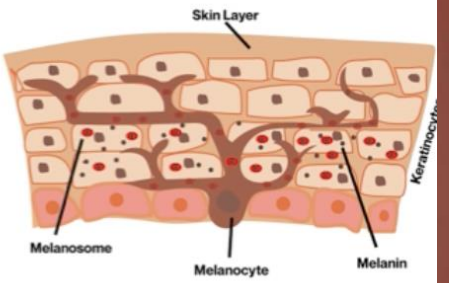


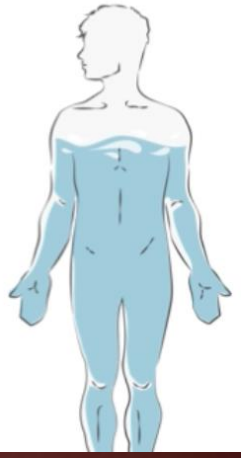
1. **Hemoglobin** - the iron-containing oxygen-transport protein present in red blood cells. Hemoglobin in blood carries oxygen from the respiratory organs to the other tissues of the body, where it releases the oxygen to enable aerobic respiration which powers the animal's metabolism

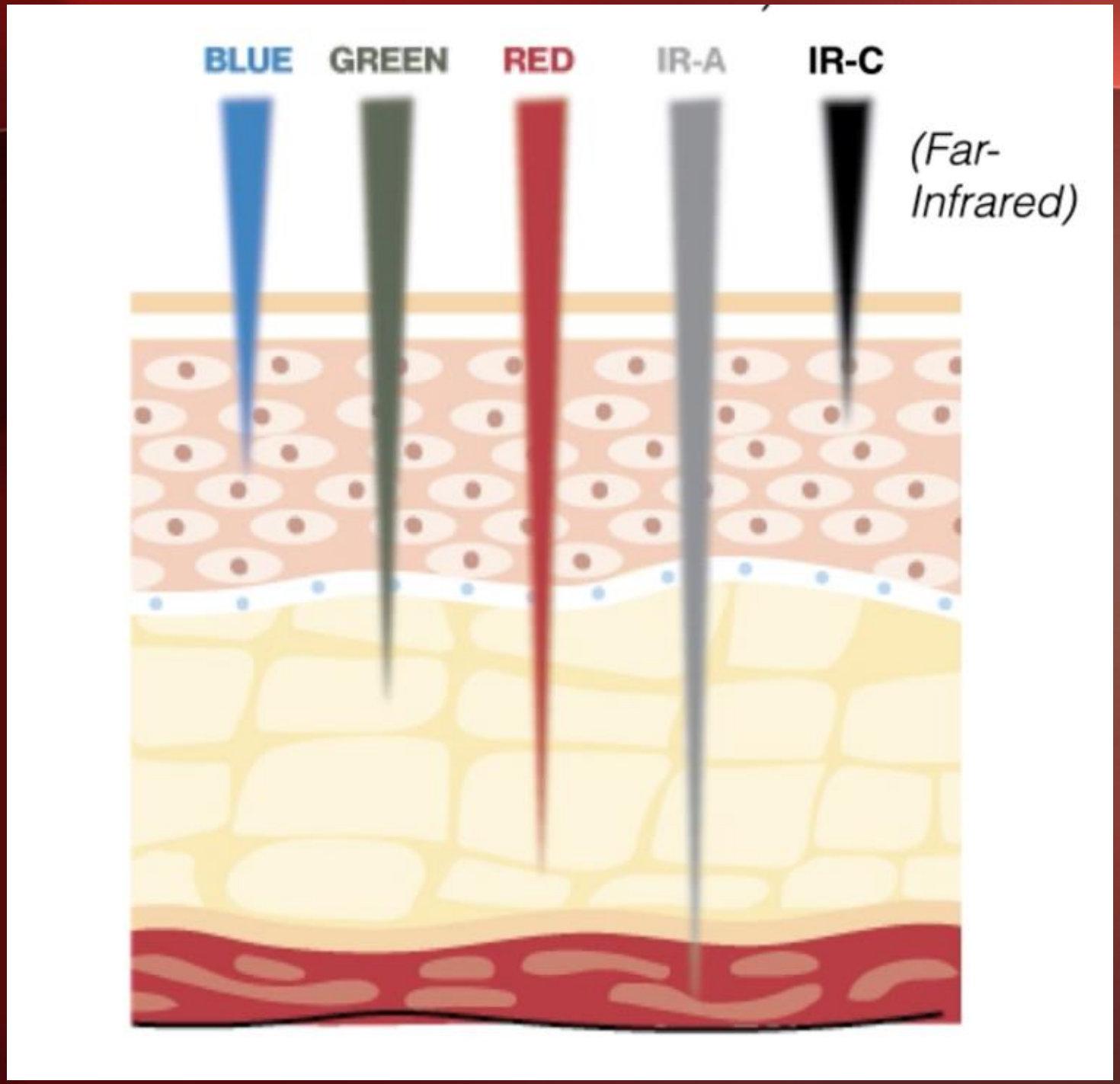
2. **Melanin** - a broad term for a group of natural pigments found in most organisms. The melanin pigments are produced in a specialized group of cells known as melanocytes.

3. **Water** - By weight, the average adult human is approximately 60% water, and the average child is approximately 70% water.[1]Most animal body water is contained in various body fluids including; extracellular fluid; plasma; interstitial fluid; and transcellular fluid.[5]Water is also contained inside organs, in gastrointestinal, cerebrospinal, peritoneal, and ocular fluids. Adipose tissue contains about 10% of water, while muscle tissue contains about 75%.

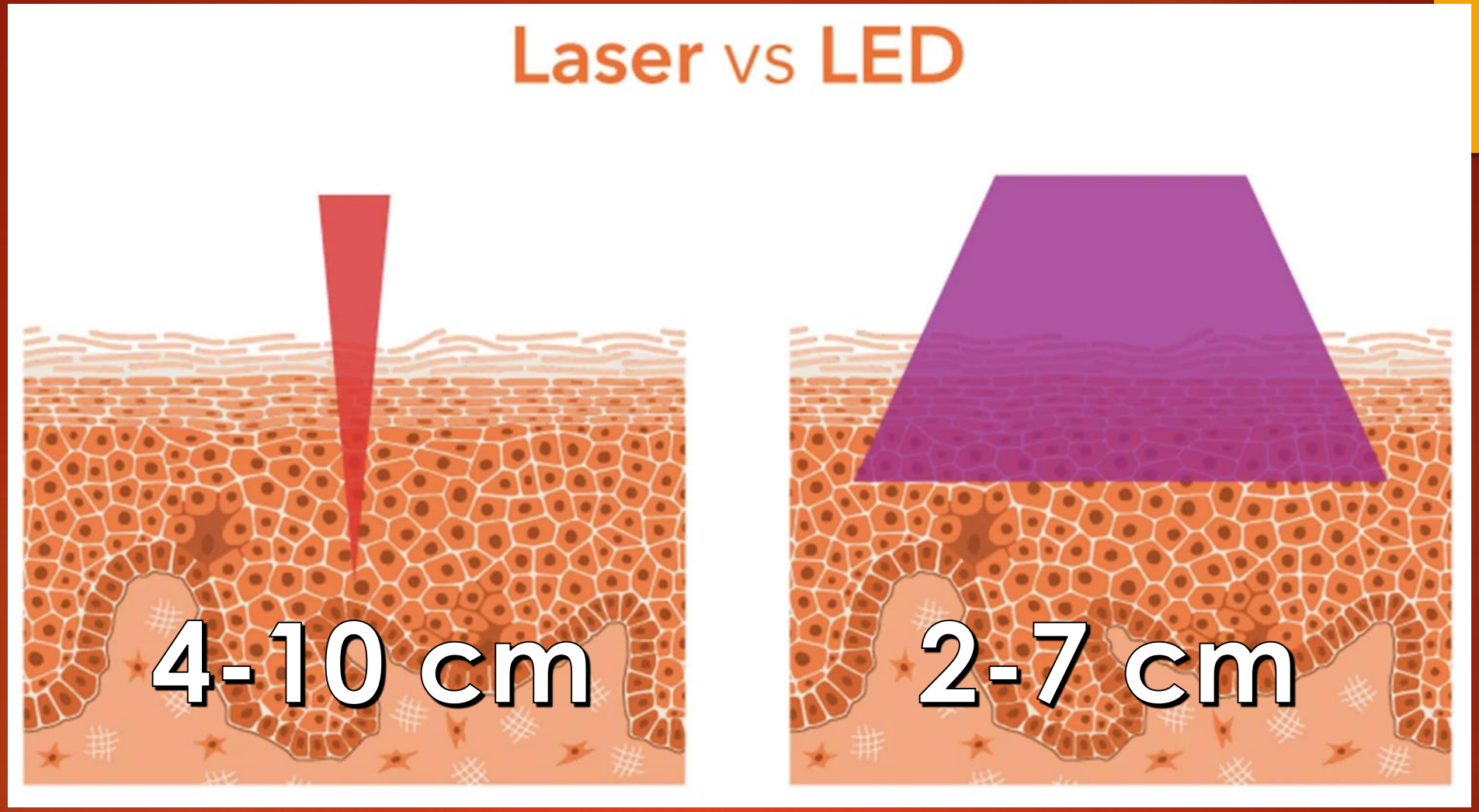
4. **Opsins** - **Cytochrome c-oxidase CCO** - enzyme cytochrome c oxidase or Complex IV is a large transmembrane protein complex that is the last enzyme in the respiratory electron transport chain of cells located in the membrane, participating in synthesizing ATP.





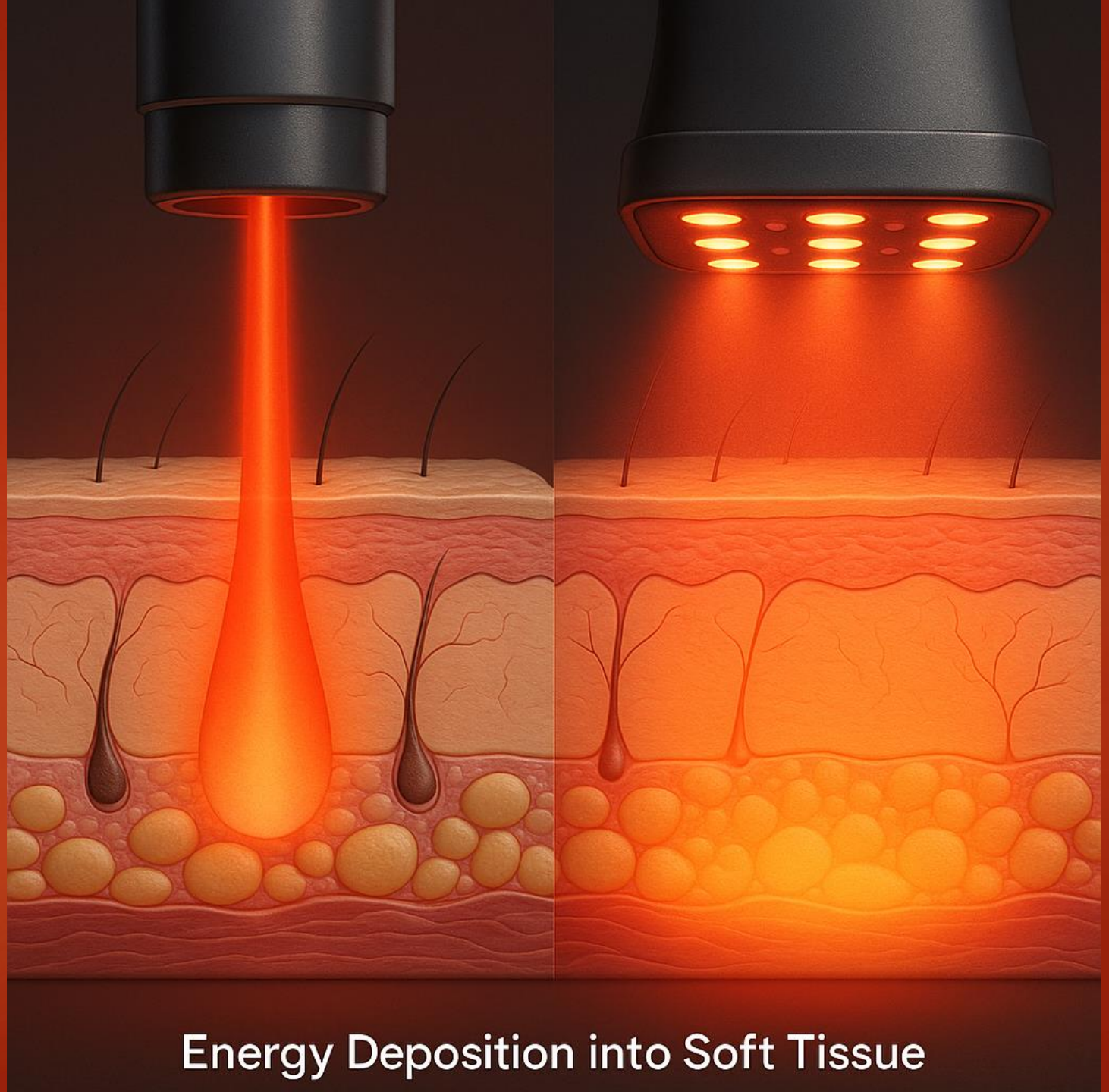

BLUE
GREEN
RED
IR-A
IR-C
(Far-
Infrared)

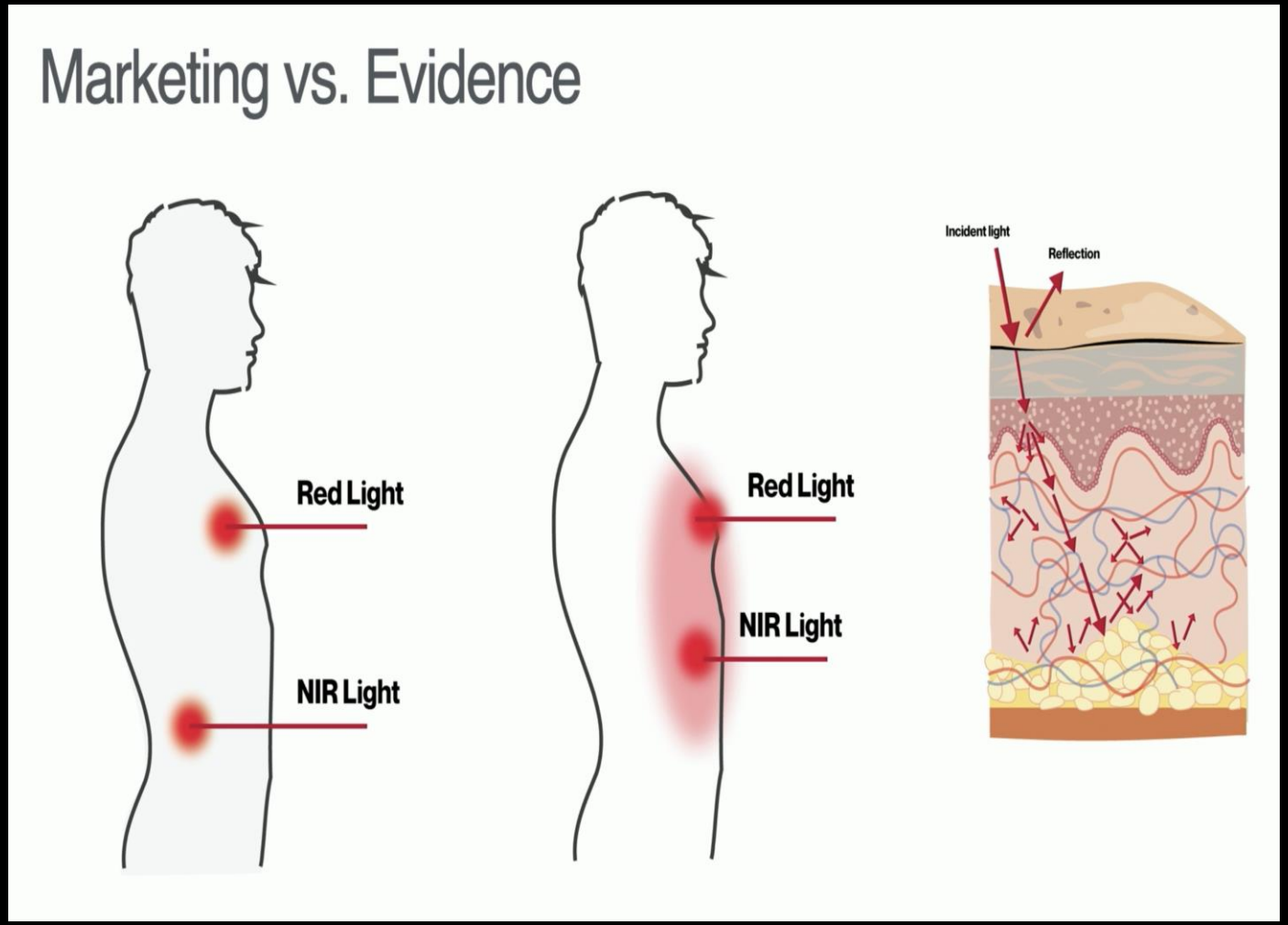

RedVive
CELLULAR REJUVENATION
635nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
670nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
810nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
850nm
1 fl. oz. (30 ml)



Coherent
Monochromatic

Non-Coherent
Polychromatic


Energy Deposition into Soft Tissue



Heiskanen V, Hamblin MR. Photobiomodulation: lasers vs. light emitting diodes? Photochem Photobiol Sci. 2018 Aug 8;17(8):1003-1017. doi: 10.1039/c8pp90049c. Erratum in: Photochem Photobiol Sci. 2018 Oct 31;18(1):259-259. doi: 10.1039/c8pp90049c. PMID: 30044464; PMCID: PMC6091542.

HAMBLIN MJ (2017)

"LEDs and lasers have similar effects, especially when using similar wavelengths and power densities... the coherent nature of laser light does not appear to be necessary for achieving therapeutic effects."

RV300

Full Body MSK Regenerative Panels

635 nm 75 LEDs

670 nm 75 LEDs

810 nm 75 LEDS

850 nm 75 LEDS

RV60

Traveler MSK Regenerative Panels

635 nm 15 LEDs

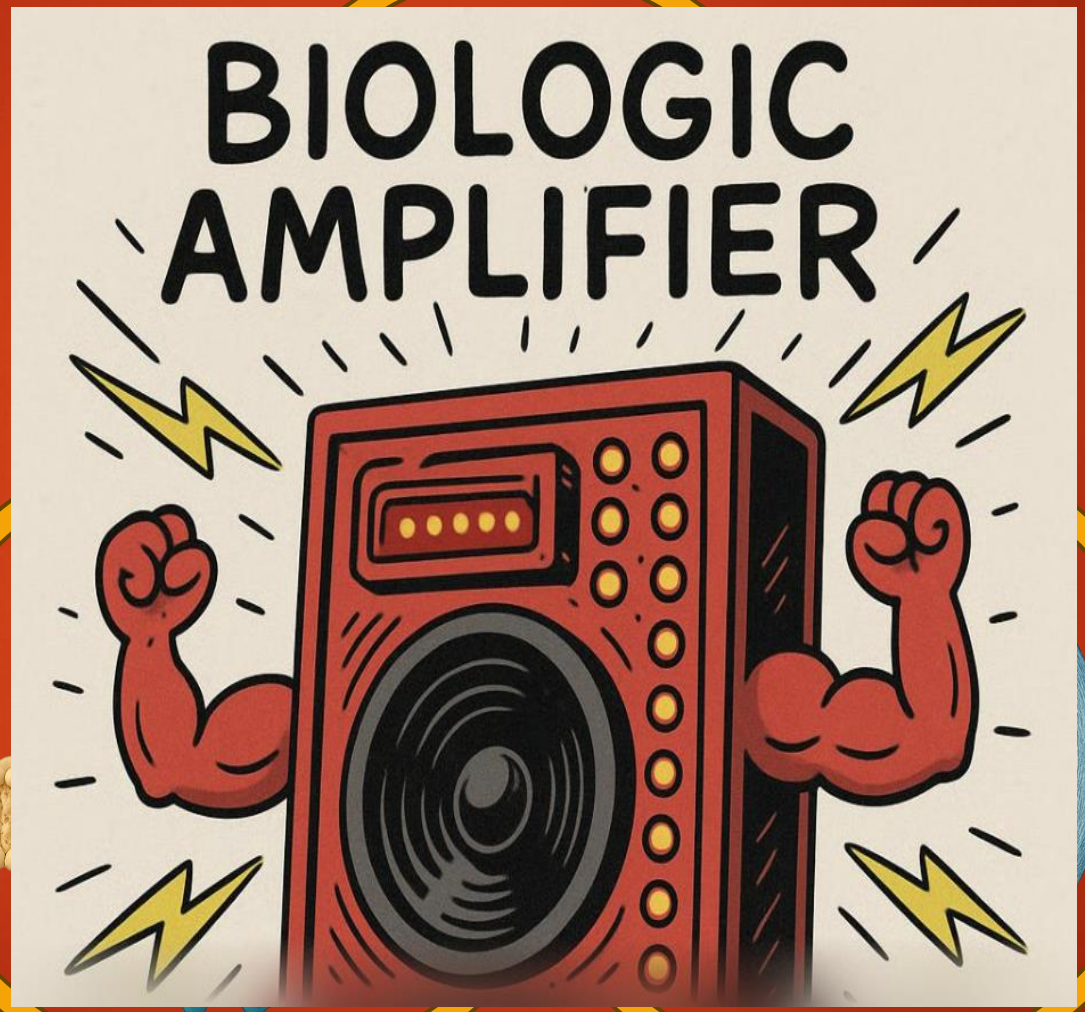
670 nm 15 LEDs

810 nm 15 LEDS

850 nm 15 LEDS

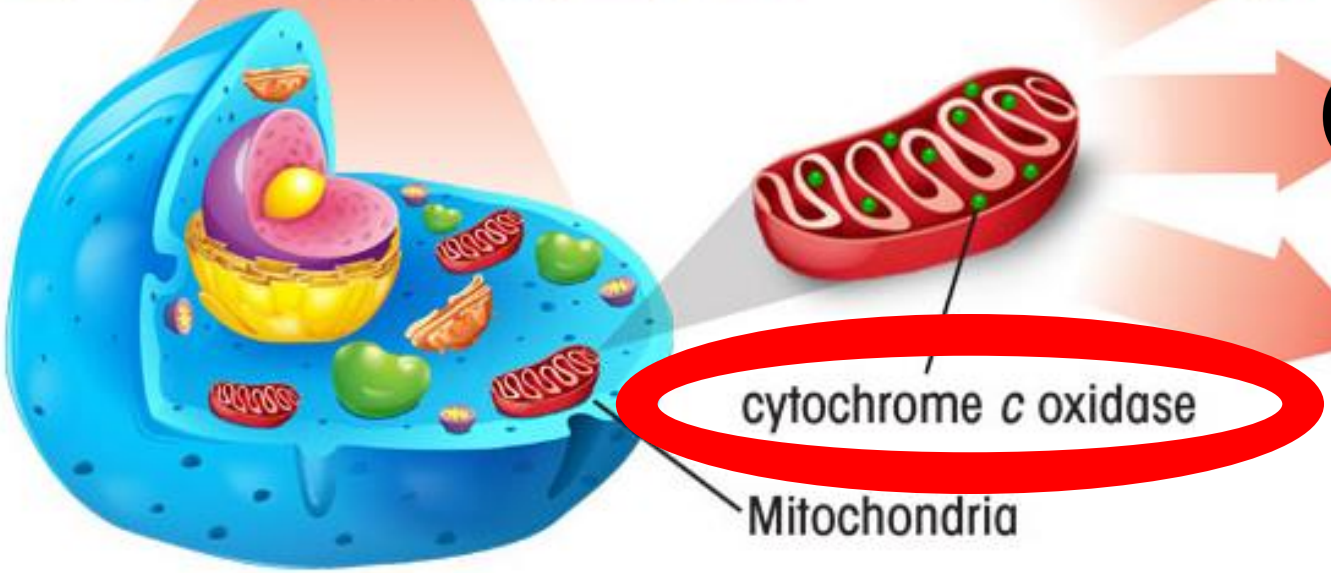
Mitochondria - Performance

TRVP1
Pain &
Inflammation



Stem Cell
Regeneration

Frankowski, D.W., Ferrucci, L., Arany, P.R. *et al.* Light buckets and laser beams: mechanisms and applications of photobiomodulation (PBM) therapy. *GeroScience* (2025). https://doi.org/10.1007/s11357-025-01505-z



B ATP

An increase in ATP, the main energy source for the majority of cellular functions, **increases the cell's ability to fight infection and accelerates the healing process**

C ROS

The modulation of ROS activates transcription factors **positively impacting cellular repair and healing**

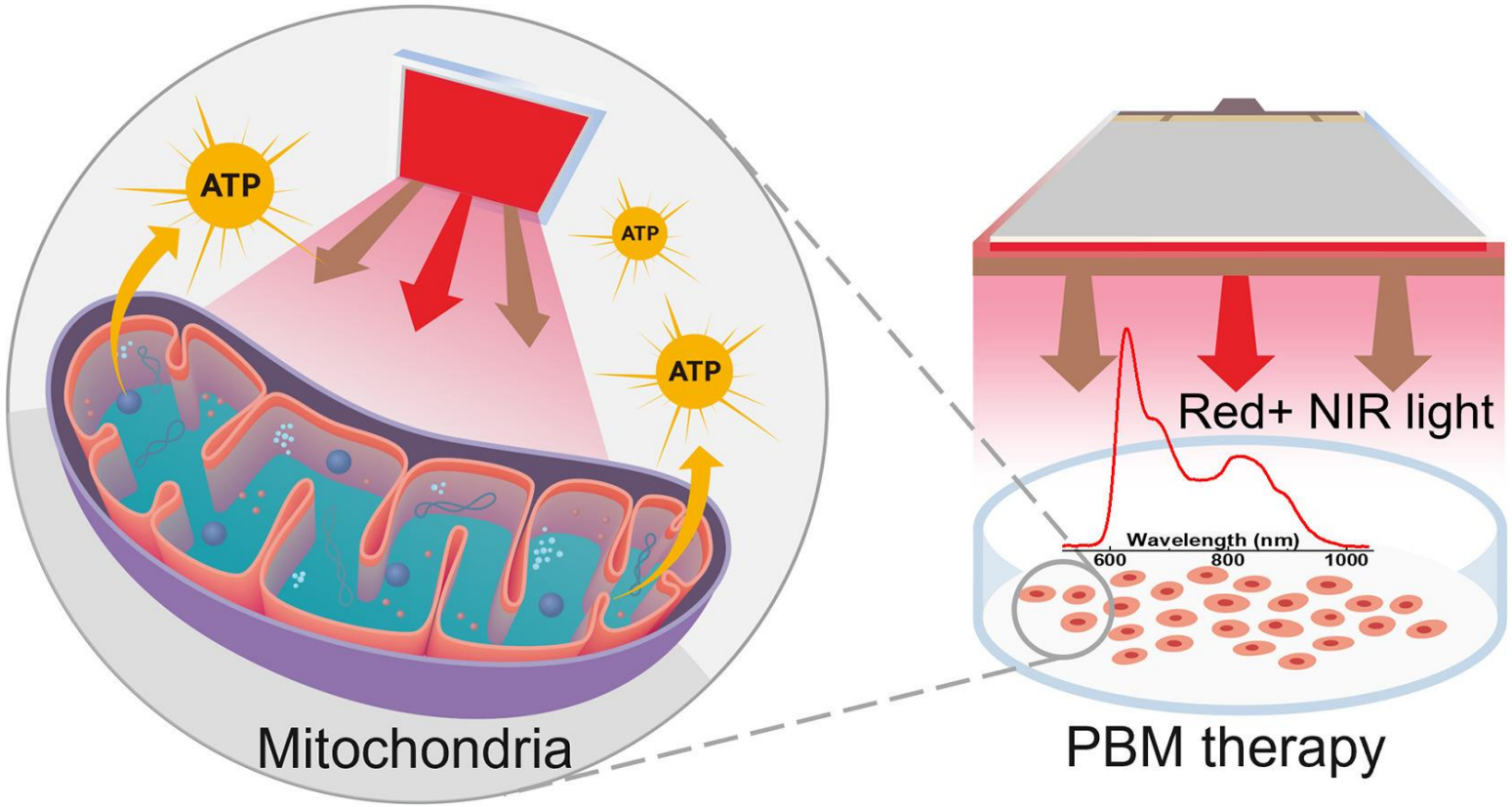
A NO

The release of NO, a potent vasodilator, **increases circulation, decreases inflammation** and enhances the **transport of oxygen and immune cells** throughout the tissue

1 Laser light at a wavelength of 670nm, 808nm or 904nm is delivered to the tissue via a probe in **contact mode** with the surface of the skin.

2 The light enters the cell's mitochondria and is absorbed by the chromophores, including the protien cytochrome *c* oxidase (CCO) which then **increases its activity.**

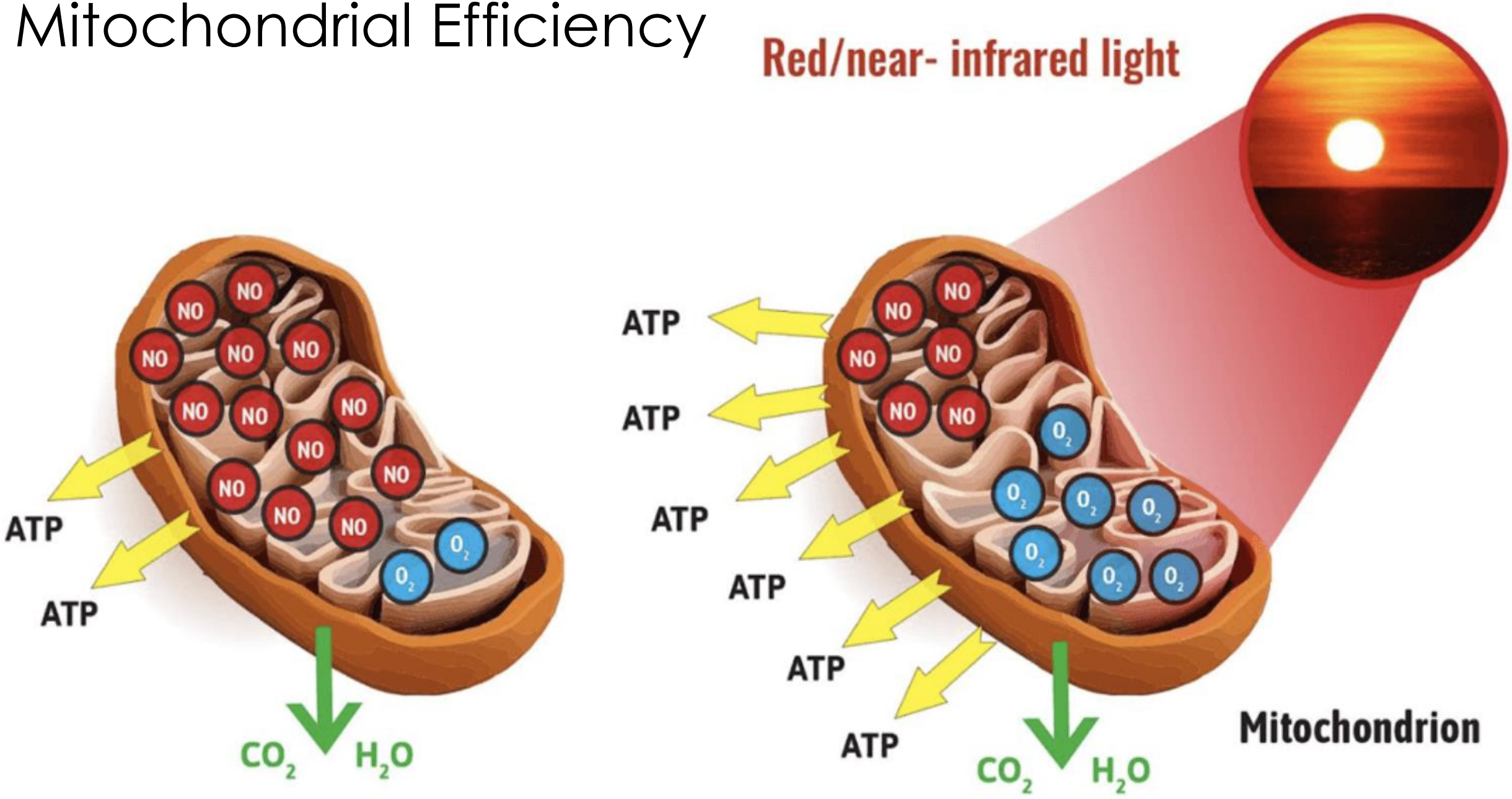
3 As a result of this heightened activity, three molecules are affected: Adenosine Triphosphate (ATP), Reactive Oxygen Species (ROS) and Nitric Oxide (NO)

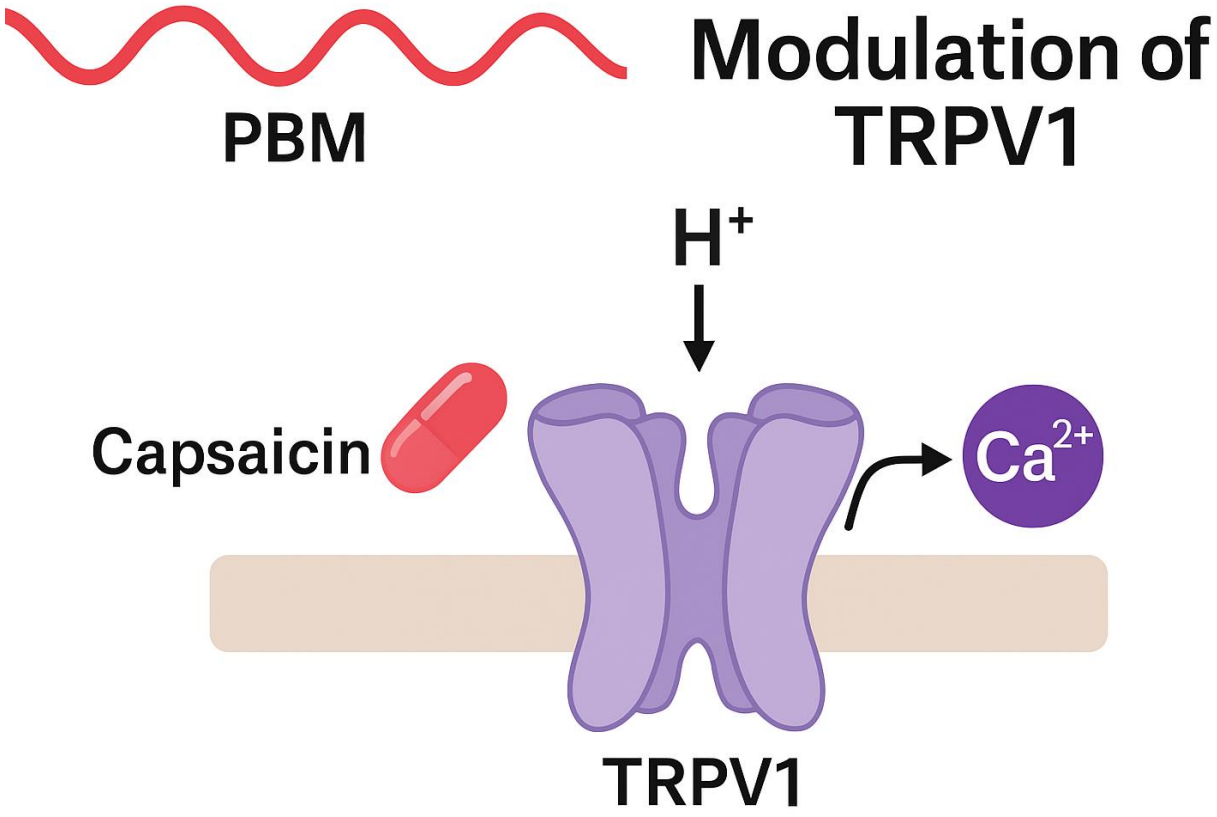


4 Key Peaks of Red & NIR Light

-635 nm
-670 nm
-820 nm
-850 nm

Mitochondrial Efficiency





Cellular and Molecular Neurobiology (2024) 44:79
https://doi.org/10.1007/s10571-024-01513-1

REVIEW PAPER

Check for updates

The Role of Photobiomodulation to Modulate Ion Channels in the Nervous System: A Systematic Review

Zhixin Zhang[1,2,3,4,5,6] · Zhiyu Zhang[7] · Peng Liu[1,2,3,4,5,6] · Xinmiao Xue[1,2,3,4,5,6] · Chi Zhang[1,2,3,4,5] · Lili Peng[1,2,3,4,5] · Weidong Shen[1,2,3,4,5] · Shiming Yang[1,2,3,4,5] · Fangyuan Wang[1,2,3,4,5]

Received: 21 September 2024 / Accepted: 6 November 2024 / Published online: 23 November 2024

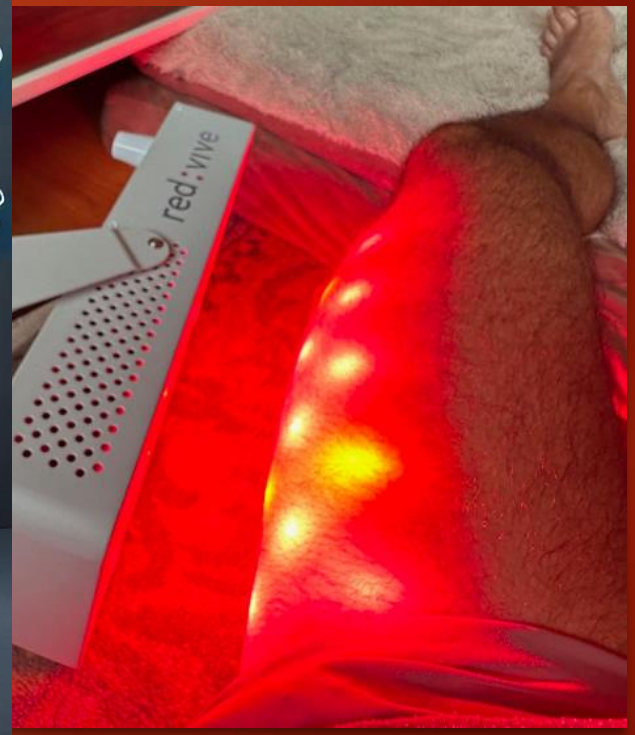
PBM:

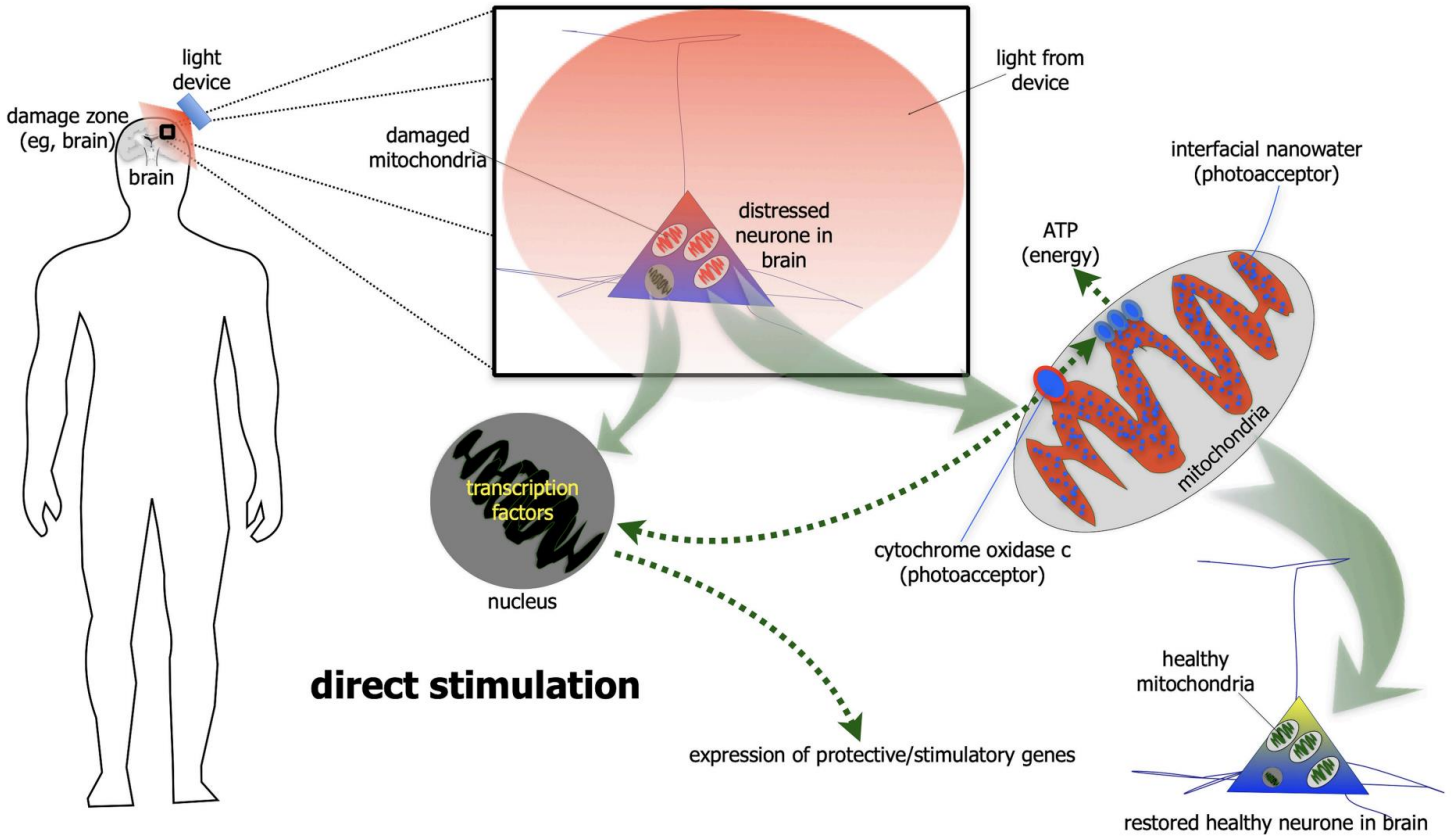
-Analgesia

-Redux Neural Inflammation

-Promotes Neuroregeneration

Systemic & Targeted

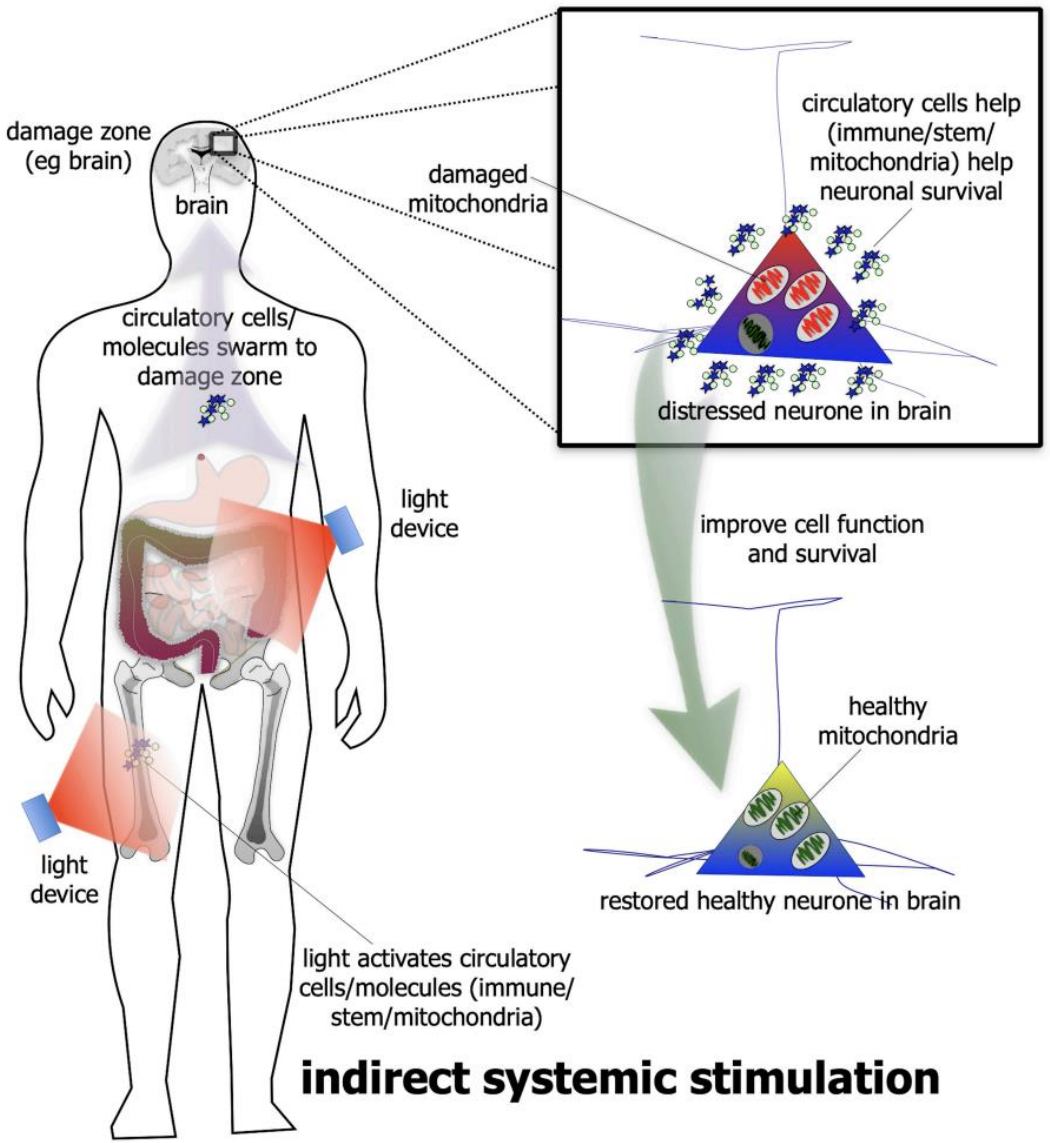




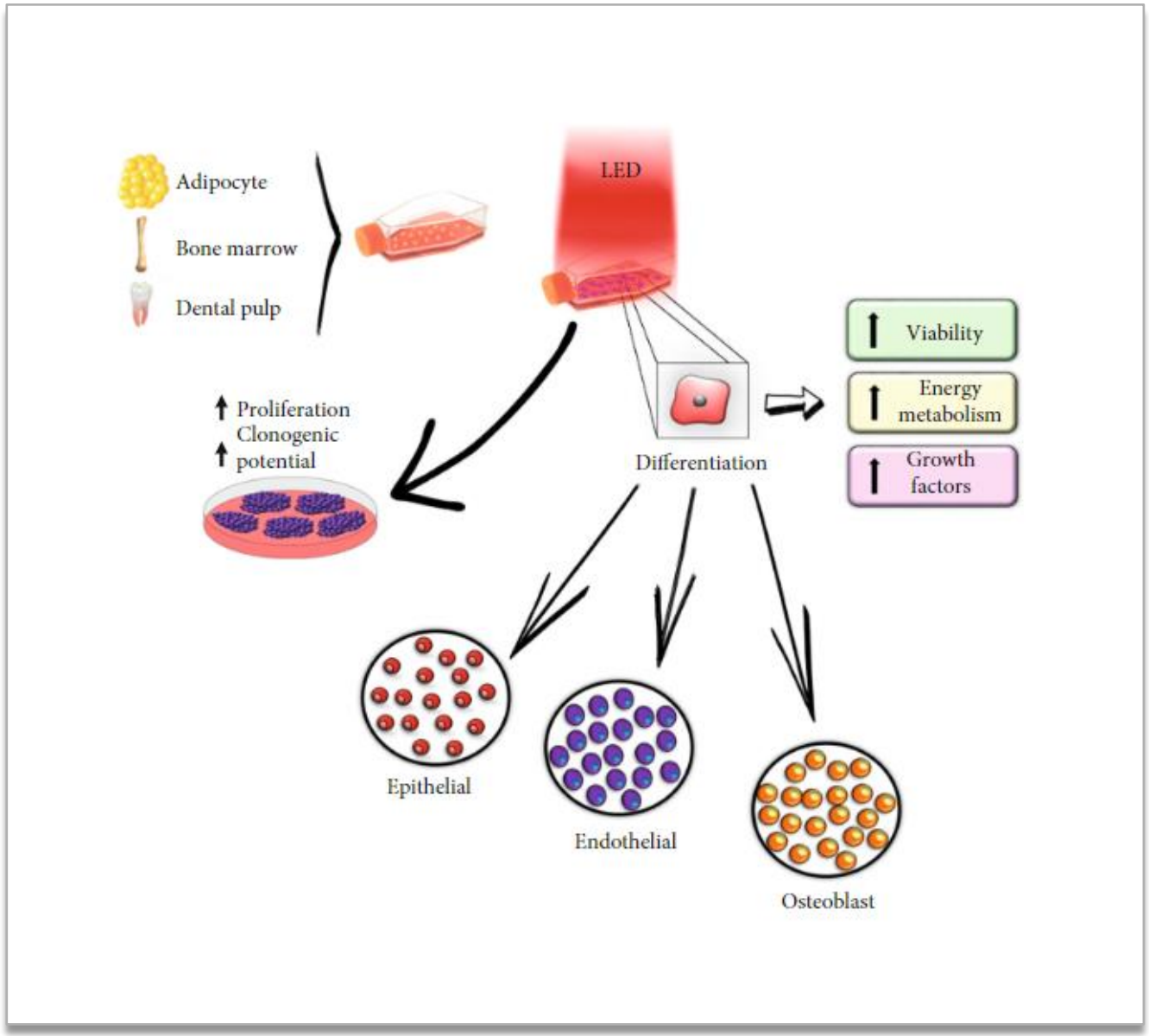
Increased ATP production and energy within the injured cells

Activation of protective and stimulatory genes

NET NET = Healthier Cells = Healing Brain



Activation of Circulatory Stem & Immune Cells



Stem Cell Activation & Mobilization

Photobiomodulation, Photomedicine, and Laser Surgery
Volume 40, Number 3, 2022

Pp. 178–182
DOI: 10.1089/photob.2021.0123

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Photobiomodulation Therapy to Autologous Bone Marrow in Humans Significantly Increases the Concentration of Circulating Stem Cells and Macrophages: A Pilot Study

Amir Oron, MD,[1] Shai Efrati, MD,[2] Keren Doenyas-Barak, MD,[2] Hana Tuby, PhD,[3] Lidya Maltz, MSc,[3] and Uri Oron, PhD[3]

Abstract

Objective: The aim of this study was to examine the effect of photobiomodulation therapy (PBMT) of the bone marrow (BM) on the concentration of stem cells and other cells in the circulating blood (CB) in humans.
Background: Circulating stem cells have received increasing attention in recent years due to their potential role in regenerative medicine. Various biological processes have been shown to be affected by PBMT.
Methods: The study was conducted on 15 volunteers. Ga-Al-As diode laser 808 nm wavelength was applied to both tibias of each volunteer for PBMT to the BM. The kinetics of concentration of various cells in the CB was followed by comparing blood samples relative to their baseline levels prior to application of PBMT to the BM. CD-34+ cells and macrophages were identified in CB samples using flow cytometry technology.
Results: PBMT to the BM caused a significant ($p < 0.01$) increase in the concentration of CD-34+ cells in the CB from 7.8 ± 3.0% (mean ± SD) of total mononucleated cell to 29.5 ± 10.1% of total commencing at about 2 h post-PBMT. The levels of CD-34+ cells peaked at 2–4 days post-PBMT and then gradually returned to baseline levels. Macrophages in the CB were also significantly ($p < 0.01$) elevated following PBMT to the BM from 7.8 ± 6.0% (mean ± SD) of the total mononucleated cells to 52.1 ± 7.9% of total.
Conclusions: Application of PBMT to the BM in humans can significantly increase the concentration of CD-34+ cells and macrophages in the CB. These cells may consequently home in on the impaired target organs and improve their function, as has been previously shown in experimental animal models. Furthermore, the results may also have clinical relevance in respect to enrichment of CB in cells that may be consequently isolated for cell therapy. Clinical Trial Registration No. is 7/14.

Keywords: low-level laser therapy, photobiostimulation, humans, bone marrow, stem cells

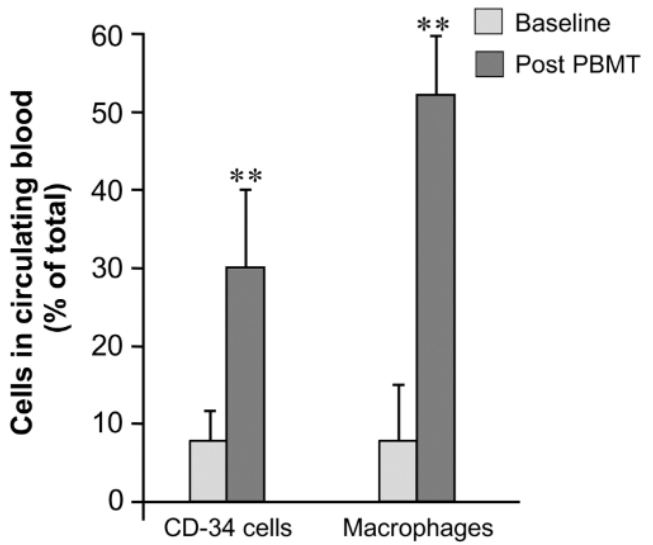


FIG. 1. Levels of CD-34+ cells and macrophages in circulating blood at baseline (open columns) and 2 days (gray columns) post-PBMT to the BM of volunteers. Results are mean ± SD of 15 subjects. $^{**}p < 0.01$. BM, bone marrow; PBMT, photobiomodulation therapy; SD, standard deviation.

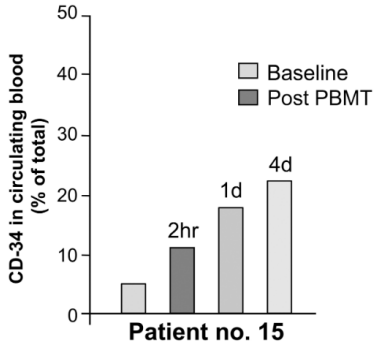


FIG. 2. Levels of CD-34+ cells in circulating blood at baseline (gray column) and 2 h, 1 day and 4 days post-PBMT to the BM in patient no. 15. Note that about a twofold increase in the level of CD-34 cells already occurred at 2 h post-PBMT to the BM, followed by a gradual and continued increase on the next day and for 4 days afterward.

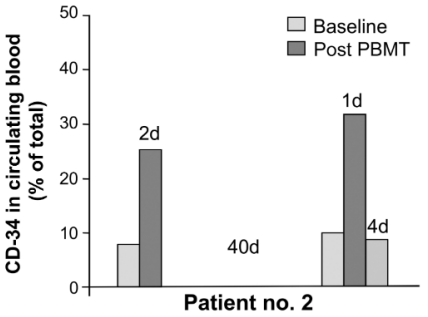


FIG. 3. Levels of CD-34+ cells in circulating blood at baseline (gray column) and different time intervals post-PBMT (red and purple columns) to the BM in patient no. 2. Note that 40 days post-PBMT the level of CD-34 cells in the circulating blood had returned to baseline level, but increased significantly again (1 day) after a second PBMT followed by a decrease 4 days later.

Photochem Photobiol Sci. 2024 Sep 4. doi: 10.1007/s43630-024-00626-2. Online ahead of print.

LED therapy modulates M1/M2 macrophage phenotypes and mitigates dystrophic features in treadmill-trained mdx mice

Valéria Andrade Pereira [1], Heloina Nathalliê Mariano da Silva [1], Evelyn Mendes Fernandes [1], Elaine Minatel [2]

Affiliations + expand

PMID: 39227554 DOI: 10.1007/s43630-024-00626-2

Abstract

The mdx mouse phenotype, aggravated by chronic exercise on a treadmill, makes this murine model more reliable for the study of Duchenne muscular dystrophy (DMD) and allows the efficacy of therapeutic interventions to be evaluated. This study aims to investigate the effects of photobiomodulation by light-emitting diode (LED) therapy on functional, biochemical and morphological parameters in treadmill-trained adult mdx animals. Mdx mice were trained for 30 min of treadmill running at a speed of 12 m/min, twice a week for 4 weeks. The LED therapy (850 nm) was applied twice a week to the quadriceps muscle throughout the treadmill running period. LED therapy improved behavioral activity (open field) and muscle function (grip strength and four limb hanging test). Functional benefits correlated with reduced muscle damage; a decrease in the inflammatory process; modulation of the regenerative muscular process and calcium signalling pathways; and a decrease in oxidative stress markers. The striking finding of this work is that LED therapy leads to a shift from the M1 to M2 macrophage phenotype in the treadmill-trained mdx mice, enhancing tissue repair and mitigating the dystrophic features. Our data also imply that the beneficial effects of LED therapy in the dystrophic muscle correlate with the interplay between calcium, oxidative stress and inflammation signalling pathways. Together, these results suggest that photobiomodulation could be a potential adjuvant therapy for dystrophinopathies.

Keywords: mdx mice; Calcium pathways; Dystrophic muscle; Exercise; Inflammatory process; Oxidative stress; Photobiomodation.

Shift of M1 to M2 with PBM


RedVive
CELLULAR REJUVENATION
635nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
670nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
810nm
1 fl. oz. (30 ml)
RedVive
CELLULAR REJUVENATION
850nm
1 fl. oz. (30 ml)

What Influences DOSE?

Time

Distance

Power

DOSING PARAMETERS

Wavelength
600-800s

Intensity
75-300 mW/cm2

Distance
3-12 inches

Time
10-30 min

Frequency
1x daily per area

Interval
3-7 days wk.

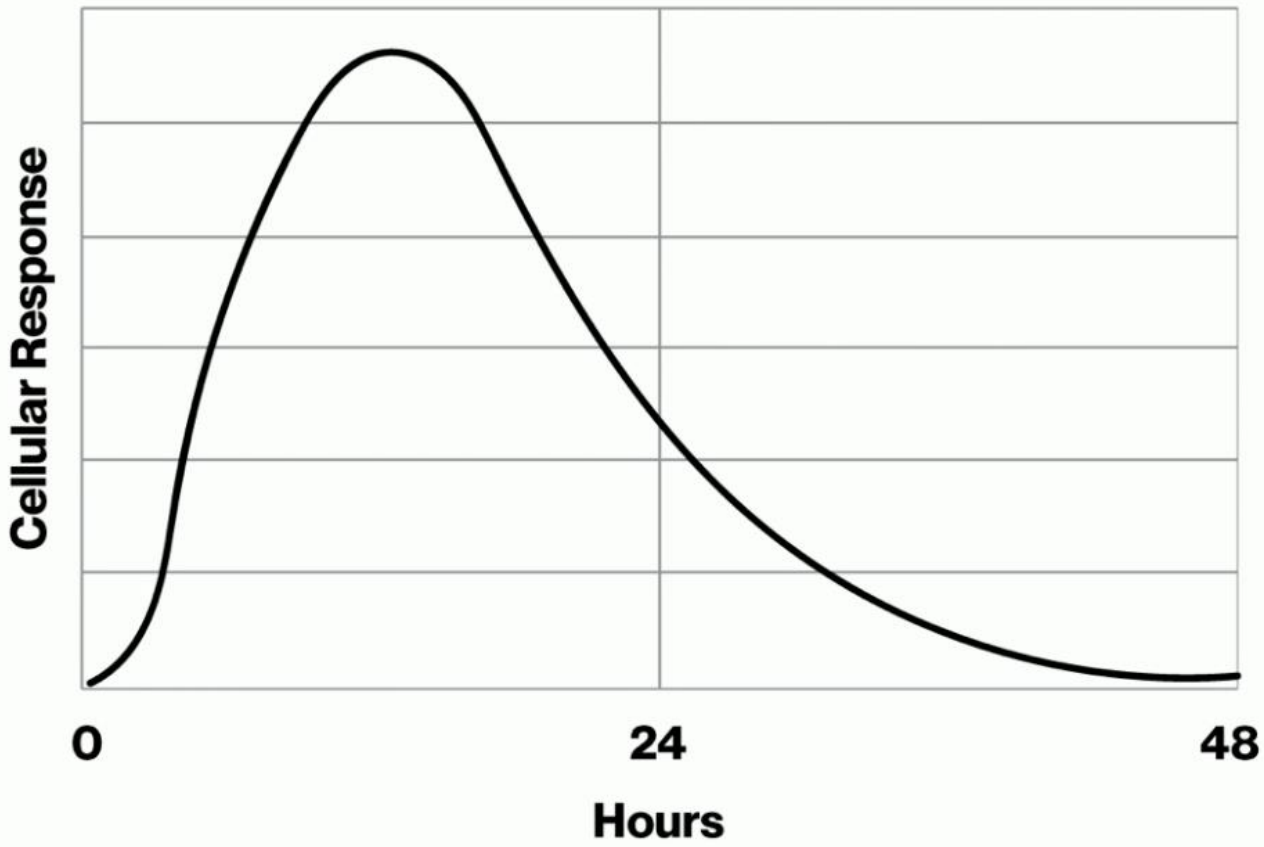
24 - 48 hour response time

Remains of effects of RLT up to 24 to 48 hours after the treatment

ATP production increases after RLT treatment (peak at 6 hours)

Cytochrome C Oxidase (CCO) enzyme activity is also considered a primary mechanism for red light therapy. Researchers have repeatedly found elevated activity of CCO for 24 hours AFTER treatment ended. [4]

Even more metabolites of **red light therapy effects found 24-48 hours after treatments** include Nitric Oxide (NO), Heat Shock Protein (Hsp70), Interleukin-2 (IL-2) and Calcium release. [1][5]



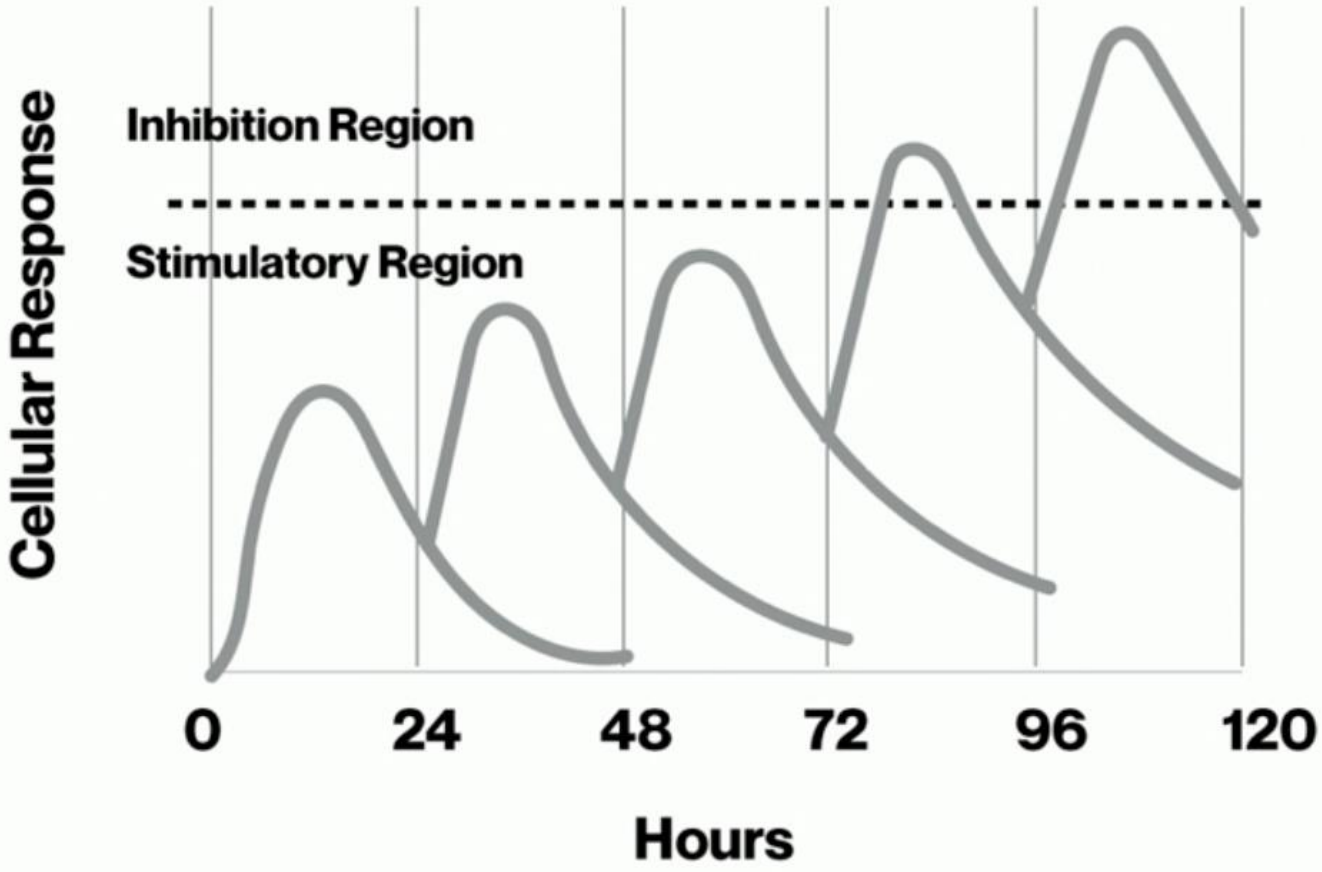
Ferraresi, Cleber et al. "Effects of Light-Emitting Diode Therapy on Muscle Hypertrophy, Gene Expression, Performance, Damage, and Delayed-Onset Muscle Soreness: Case-control Study with a Pair of Identical Twins." *American journal of physical medicine & rehabilitation* vol. 95,10 (2016): 746-57. doi:10.1097/PHM.0000000000000490

Cumulative RLT Dose Response

PMB stacks, cumulative effects in the cells if applied repetitively

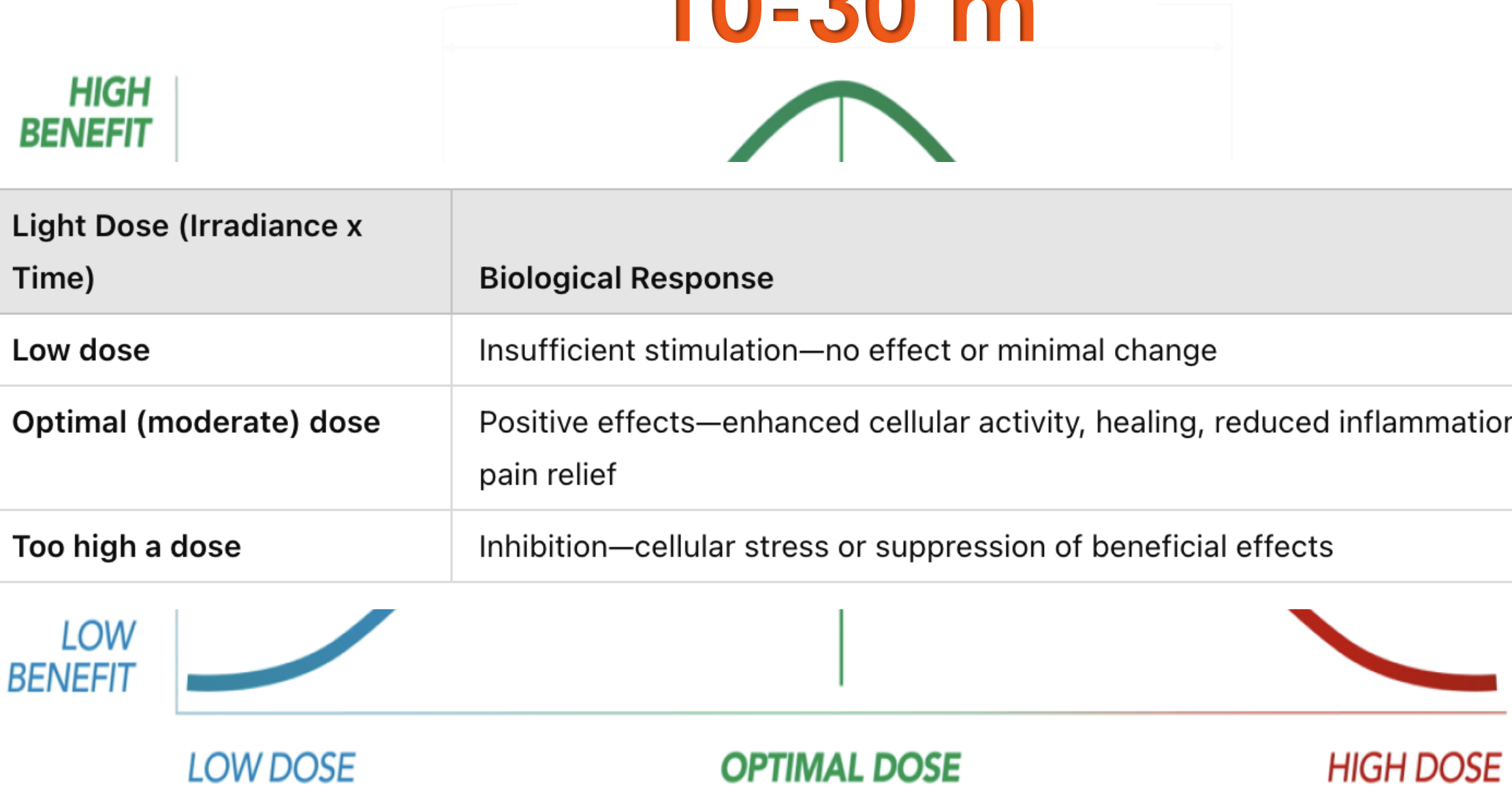
Builds/strengthens cellular responses until it doesn't..

"The dose from one treatment lasts some time and what "remains" of the dose is added to the dose at the next treatment. Adequate time between doses is essential to allow the cells time to respond to the initial dose and will also avoid a situation where the accumulated dose eventually ends up above the bio-stimulating range or even in the bioinhibitory range, with consequently poorer results." [1]



Hawkins D, Abrahamse H. Effect of multiple exposures of low-level laser therapy on the cellular responses of wounded human skin fibroblasts. Photomed Laser Surg. 2006 Dec;24(6):705-14. doi: 10.1089/pho.2006.24.705. PMID: 17199470.

10-30 m



Light Dose (Irradiance x Time)	Biological Response
Low dose	Insufficient stimulation—no effect or minimal change
Optimal (moderate) dose	Positive effects—enhanced cellular activity, healing, reduced inflammation, pain relief
Too high a dose	Inhibition—cellular stress or suppression of beneficial effects

More than Wavelength

- **The Power Density Intensity of the light**
- **Temperature of the cells**
- **Circadian rhythm and time of day of light application**

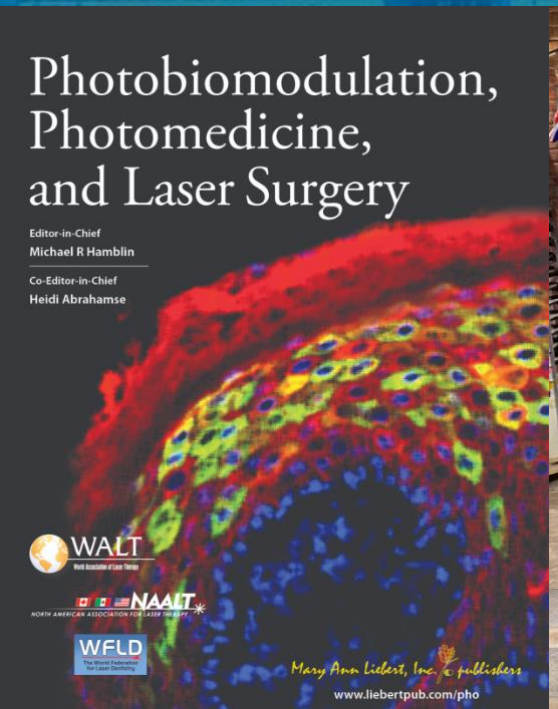
From Clinic to Couch

Integrated PRE & POST procedure

Daily Healing Homework

WALT

WORLD ASSOCIATION FOR PHOTOBIOMODULATION THERAPY



PBM2024 LONDON
AUGUST 23rd-25th, 2024

PBM2024 ABSTRACTS

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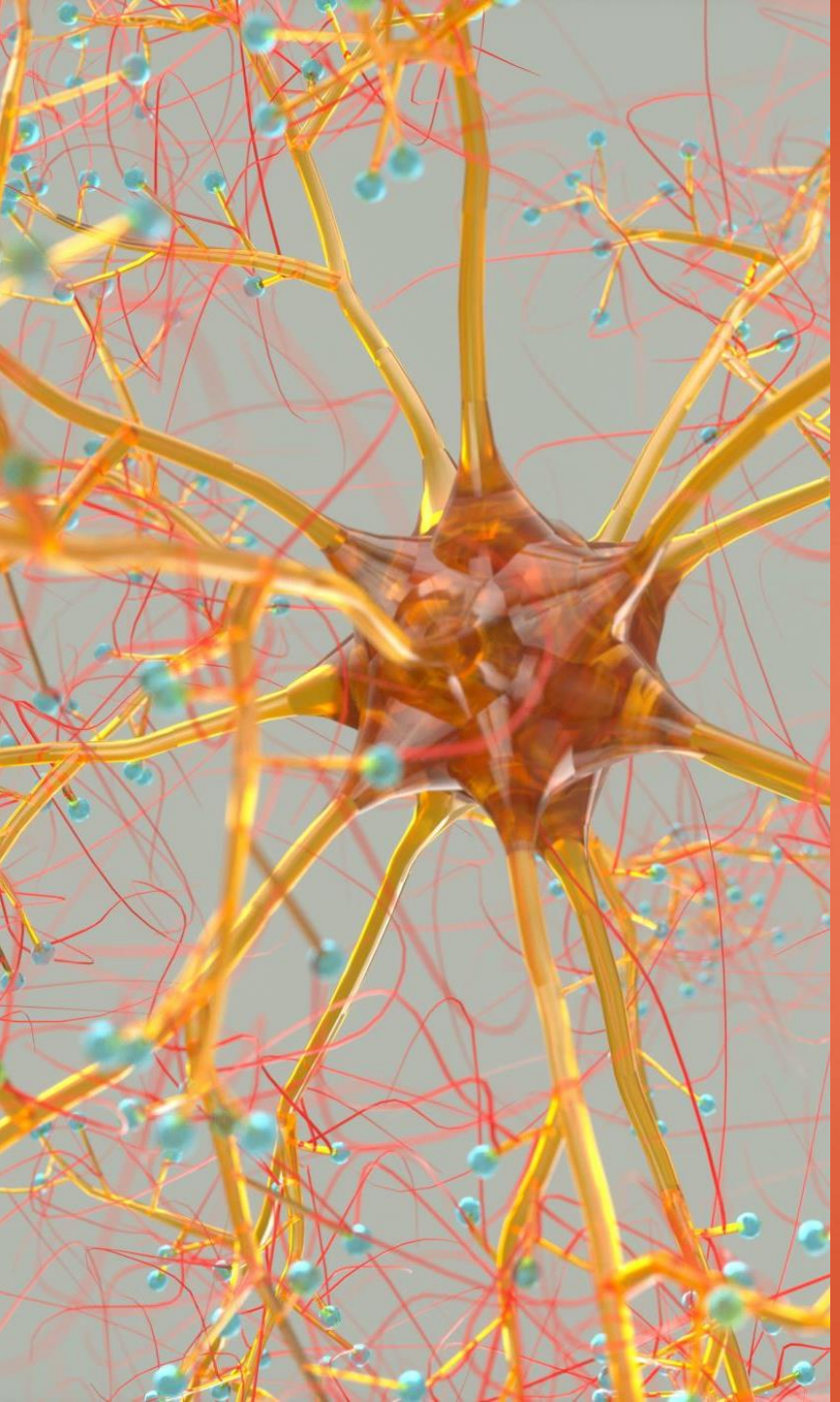
Shining a Light on Mucositis

A new study conducted by St. Jude Nursing Research uses a painless therapy to help children avoid a common side effect of bone marrow transplantation.

By Carrie L. Strehlau; Photos by Justin Veneman

St. Jude Children's Research Hospital®

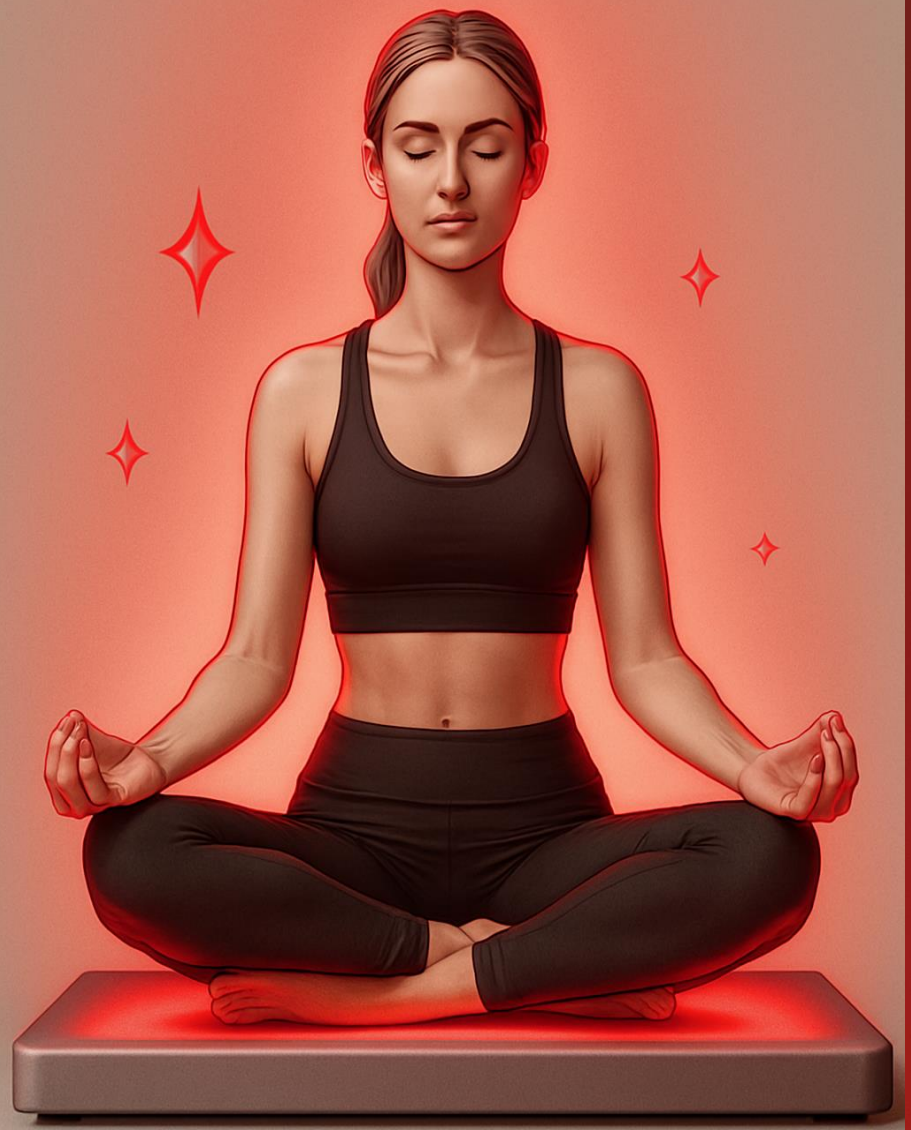


Indications

- Neuropathic Pain
- Neuropathy
- Wound Healing - Burns
- Skin Health
- Peri-Operatively
- Peri-Procedural (regenerative medicine)
- Inflammation & Gut Health
- General Wellness
- Cognitive Function
- Cardiovascular Health

WELLNESS SEEKER

"Daily vitality & mood"

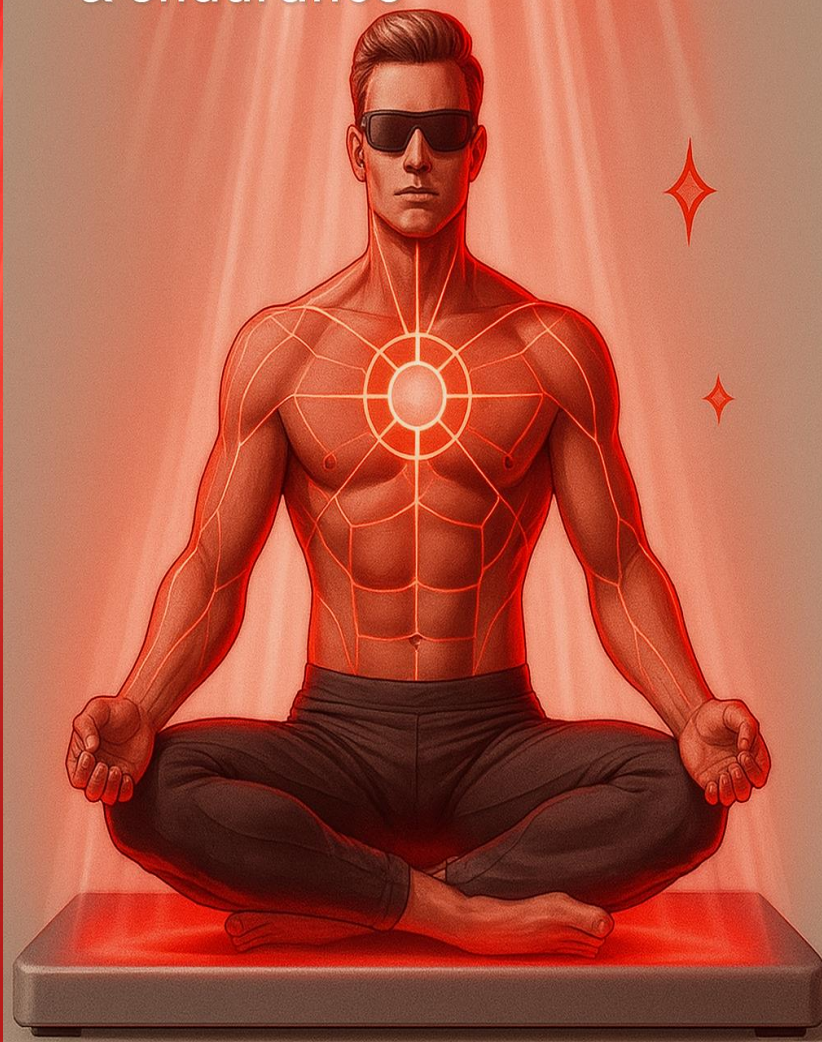


RECOVERY + PAIN PATIENT

Inflammation & joint care

HIGH-PERFORMANCE OPTIMIZER

"Mitochondrial priming & endurance"

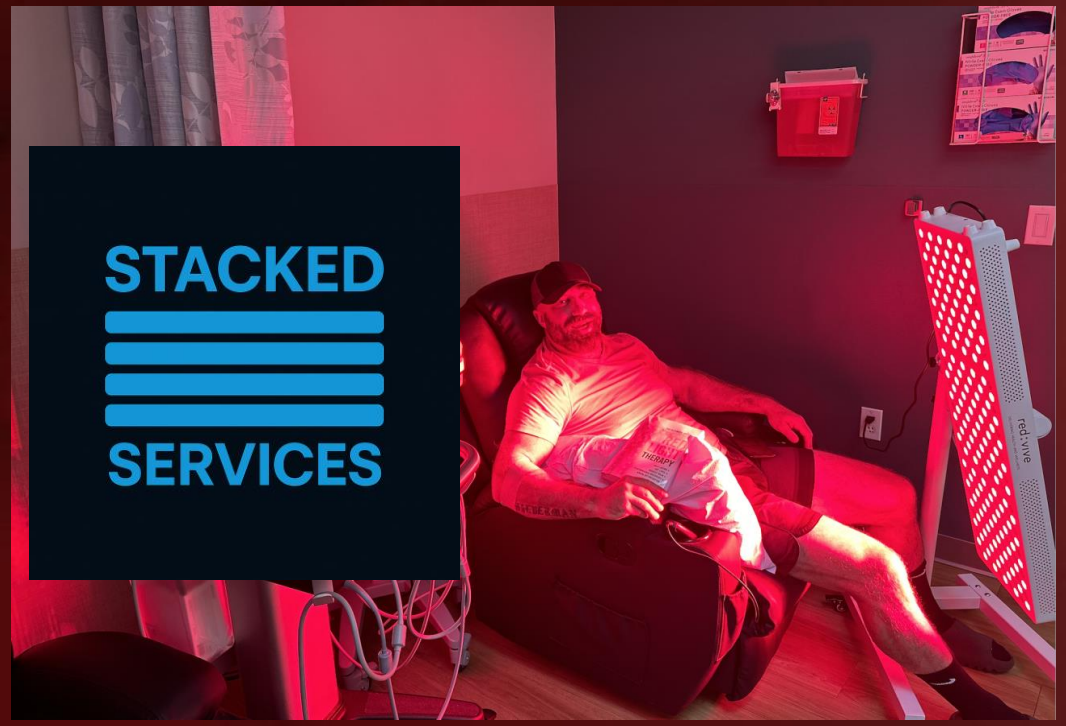


RedVive

Ambient Circadian Alignment

TWO FLEXIBLE WAYS TO INCORPORATE REDVIVE PHOTOBIOMODULATION

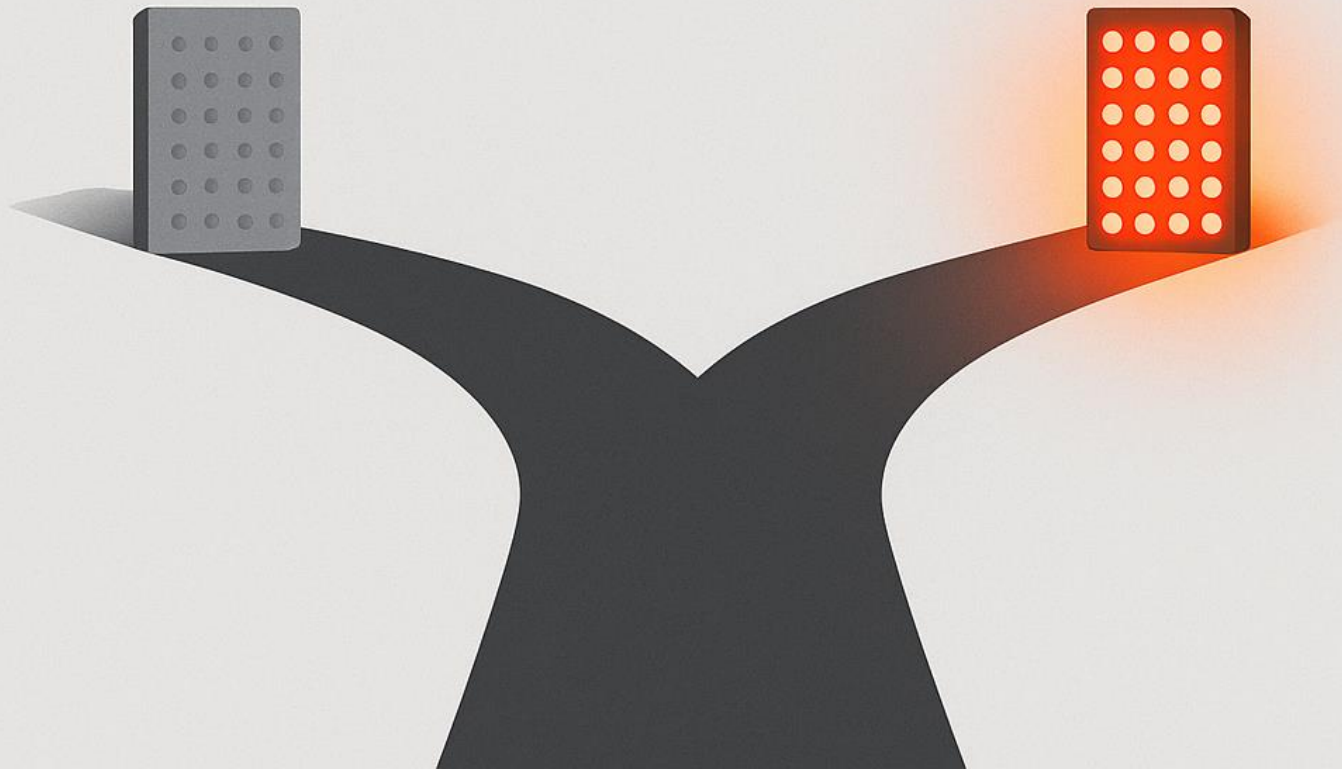
Clinical Use & Integration



Education Referral Path

Choosing the Right PBM Partner

Not all devices — or companies — are created equal.



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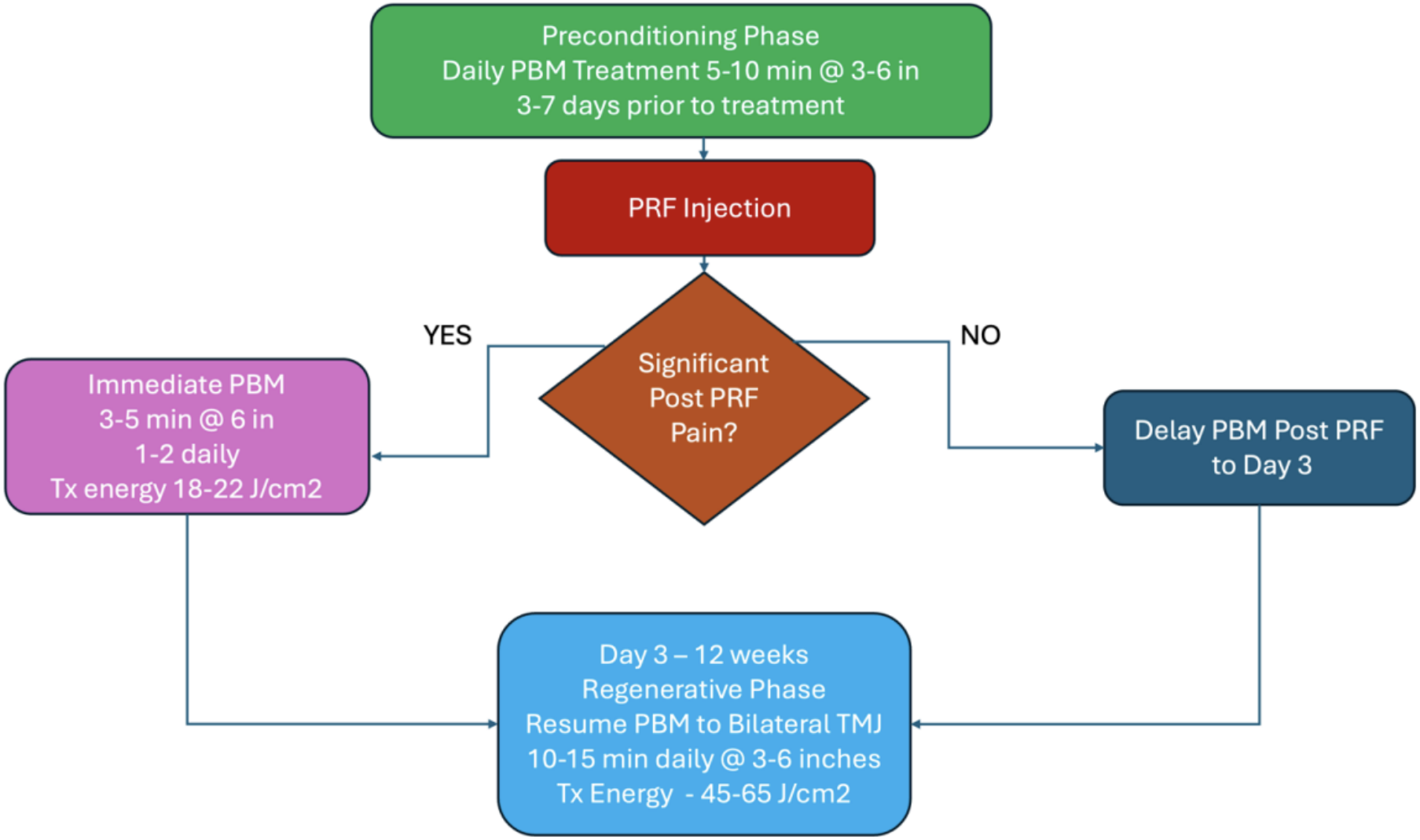
Photobiomodulation Therapy Partially Restores Cartilage Integrity and Reduces Chronic Pain Behavior in a Rat Model of Osteoarthritis- Involvement of Spinal Glial Modulation	Arthritis	This study explores the effect	**Original Research**	- Photobiomodulation Therapy	201
Brain Waste Removal	Brain Health	This article delves into the vita	**Narrative Review**	- Brain Health - Glymphatic Sy	202
Can infrared light really be doing what we claim it is doing_ Infrared light penetration principles, practices, and limitations	Brain Health	This article provides a critical	**Commentary**	- Infrared light therapy - Brain	202
Editorial- Photobiomodulation therapy for brain disorders	Brain Health	This editorial examines photol	**Editorial**	- Photobiomodulation - Brain	202
Modifying Alzheimer's disease pathophysiology with photobiomodulation model, evidence, and future with EEG-guided intervention	Brain Health	The research paper explores t	**Original Research**	- Alzheimer's disease - Photo	202
PBM and depression	Brain Health	This review article explores ph	**Review**	- PBM - Photobiomodulation -	202
Photobiomodulation Therapy on Brain Pioneering an Innovative Approach to Revolutionize Cognitive Dynamics	Brain Health	This article explores Photobio	**Original Research**	- Photobiomodulation - Brain	202
J of Cosmetic Dermatology - 2024 - Nishioka - Clinical Protocol Effects With LED Photobiomodulation for Reducing Adipose	Fat Loss	This article examines the effe	**Original Research**	- LED photobiomodulation - A	202
Photobiomodulation in Temporomandibular Dysfunction a Systematic Review	TMD	This systematic review explor	**Systematic Review**	- Photobiomodulation - Tempo	20

4. Clinical Flowchart: Choosing Your PBM Timing:



RedVive Medical Protocols

All Protocols | By Medical Field | Implementation Timeline +

Protocol Name	Medical Field	Provider Type	Patient Population	Co
REDVIVE "ROPE" - Regenerative Optimiz	Orthobiologics General	Dentist, MD/Physician	Adult, Adolescent, Pediat	
REDVIVE Knee Degeneration (OPEN)	Orthopedics	MD/Physician	Pediatric, Adolescent, Ad	
REDVIVE Sleep Appliance & Photobiomod	Dental	Dentist, Specialist MD	Adolescent, Adult	
REDVIVE TMJ + Photobiomodulation (PBI	Dental	Dentist, Specialist MD	Adolescent, Adult	

+ New item

REDVIVE Regenerative Optimization & Protocol Enhancement (ROPE) - 5 Phase Approach + ExVivo

Phase 1: Preconditioning (Up to 2 Weeks Prior to Injection)

Timeline: Begin ideally 2 weeks prior, continue daily

Frequency: Daily

Duration per Area:

- **Abdomen or Posterior Pelvis/Low Back (Systemic):** 5–10 minutes
- **Target Joint/Spine Region (Local):** 5–10 minutes
- **Ambient Circadian Alignment (ACA):** Morning & Pre-bedtime red light exposure, 10–20 mins

---

Protocol Zones:

- **Systemic Priming:**
  - **Abdomen / Posterior Pelvis / Sacrum / Lumbar region**
  - Stimulates mesenteric and pelvic lymphatics, gut-brain axis, vagal tone, stem cell pools
- **Target Tissues:**
  - Direct light to involved joint(s), spine segment, or TMJ
  - Prepare local mitochondria and extracellular matrix

- **ACA Circadian Alignment (Systemic Neuroendocrine Modulation):**
  - Bedroom/bathroom red light upon waking and pre-bedtime (simulate sunrise/sunset)
  - Can go to sleep as part of treatment - Photons will penetrate through closed eyelids

---

Physiologic Goals of Preconditioning

Mechanism	Benefit
Mitochondrial priming	Enhanced bioenergetics, antioxidant buffering
Systemic stem cell mobilization	Activates circulating repair mediators
Nitric Oxide (NO) release	Vasodilation, O2 delivery, improved blood flow
Immune modulation	Prepares macrophages, reduces maladaptive inflammation
Lymphatic stimulation	Clears interstitial waste, supports ECM turnover
Neuroendocrine entrainment (via ACA)	Improves cortisol, melatonin, and growth hormone cycles for sleep, recovery, & healing

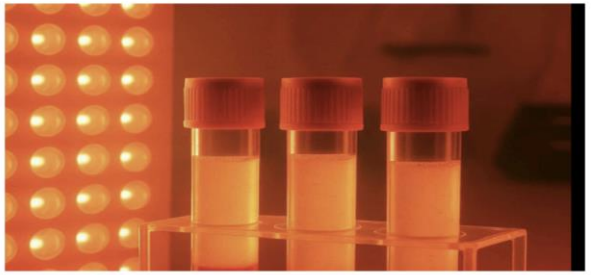
Recommended: Add ACA (Ambient Circadian Alignment) protocol for central nervous system reset.

Ex-Vivo PBM Phase: Cellular Activation of Biologics Before Injection

This protocol supports *photobiomodulation preconditioning of biologic products*—such as PRP, bone marrow concentrate (BMC), stromal vascular fraction (SVF), or expanded stem cells—prior to patient delivery.

When to Use:

- **Just prior to injection or reinfusion (within 30–60 minutes)**
- **In procedures involving:**
  - PRP (leukocyte-rich or poor)
  - Bone marrow aspirate concentrate
  - Lipoaspirate/SVF or adipose-derived stem cells
  - Cultured MSCs or exosomes



Talk Tracks Program

All Talk Tracks | Program Overview | By Role | By Use Case | Content Libra

- Assistant Talk Tracks
- Discharge and Recovery Talk Tracks
- Front Desk Talk Tracks
- Memorable Quotes and One Liners
- Physician/Provider Talk Tracks
- Program Overview and Getting Started
- RedVive Talk Tracks – Script Library
- Scheduling Talk Tracks

Rahul N. Desai, MD

Schedule a Call

BECOME A red:vive AFFILIATE