

ANALGESIC PHOTOBIO-MODULATION

PhotoBioModulation and Chronic Pain

Treatment of Chronic Pain is a major public health challenge. Photobiomodulation (PBM) offers an innovative, multimodal analgesic solution (see table) through the use of red and infrared waves. The primary effect is an improvement in ATP production by the mitochondria. A significant anti-inflammatory effect is observed, reducing levels of inflammatory cytokines (TNF alpha, Interleukin 1-6) and prostaglandins. The healing effect is related to the better availability of ATP, the improvement of local microcirculation through the release of NO, and the release of cellular growth factors such as NGF, BDNF. These effects help reduce peripheral sensitization, central sensitization, and thus prevent the pain chronicization.

ATP: Adenosine Tri Phosphate, TNF: Tumor Necrosis Factor, NO: nitric oxide, NGF: Nerve Growth Factor, BDNF: Brain Derived Neurotrophic Factor

Anders, Juanita J., et al. « Light-Emitting Diode Therapy and Low-Level Light Therapy Are Photobiomodulation Therapy ». Photobiomodulation, Photomedicine, and Laser Surgery, vol. 37, no 2, février 2019, p. 63-65.

Chung, Hoon, et al. « The Nuts and Bolts of Low-Level Laser (Light) Therapy ». Annals of Biomedical Engineering, vol. 40, no 2, février 2012, p. 516-33.

Tomazoni, Shaiane Silva, et al. « Effects of Photobiomodulation Therapy on Inflammatory Mediators in Patients with Chronic Non-Specific Low Back Pain: Protocol for a Randomized Placebo-Controlled Trial ». Medicine, vol. 98, no 15, avril 2019, p. e15177.

INNOVATIVE SOLUTION

➔ ANTI-INFLAMMATORY

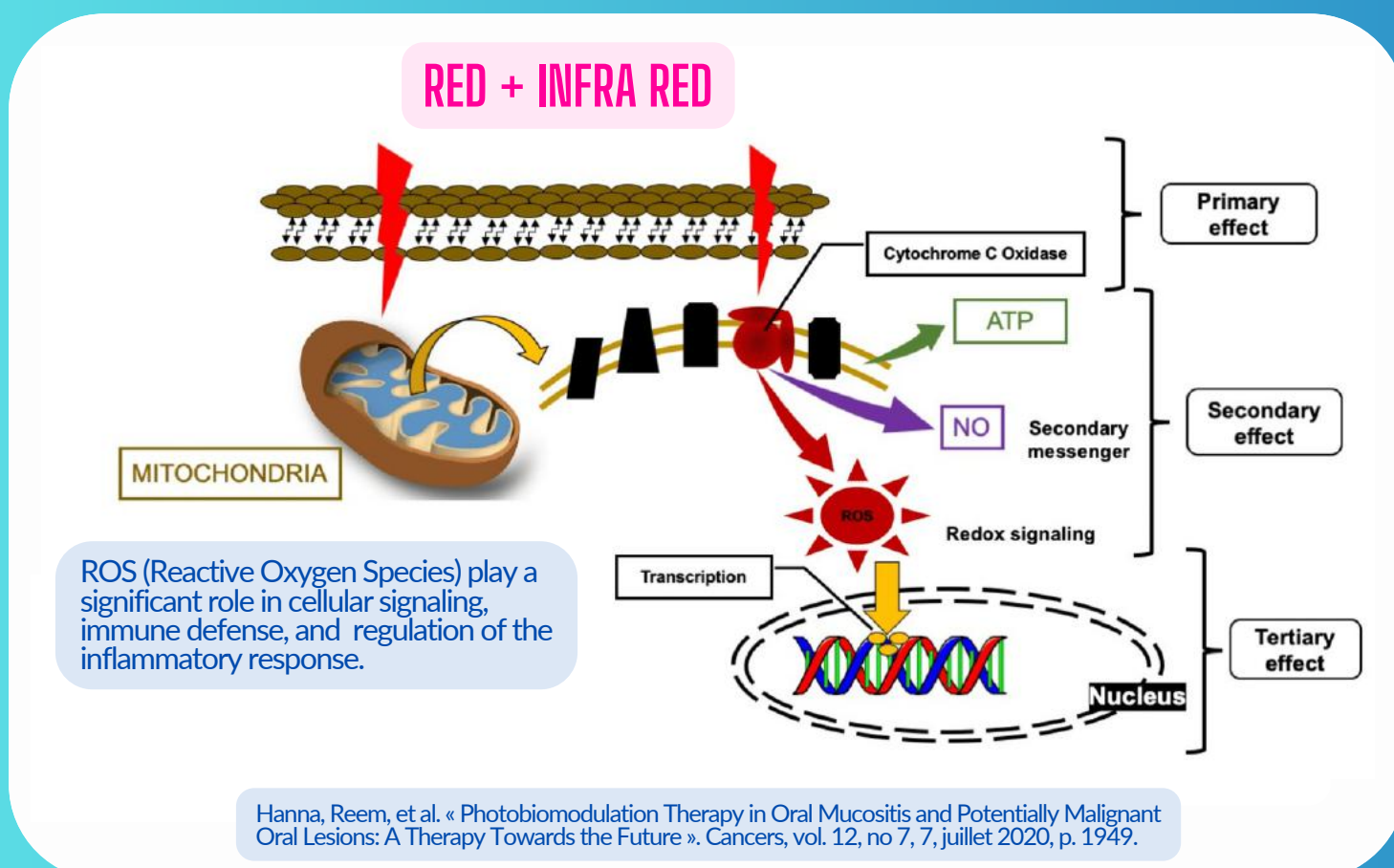
➔ DESENSITIZING

➔ HEALING



MECHANISM OF ACTION	ANALGESIC TREATMENTS	PBM
PERIPHERAL ANALGESIC	NSAID	✓
CENTRAL ANALGESIC	OPIOID	✗
LOCAL ANALGESIC	LIDOCAIN PATCH	✓
LOCAL DESENSITIZING	BOTULINIC TOXIN CPASAICIN	✓
GLOBAL DESENSITIZING	GABAPENTINOIDS KETAMINE	CONSEQUENCE OF LOCAL ACTION
MOOD REGULATION	RELAXATION HYPNOSIS EMDR	✓
MODULATION OF DESCENDING CONTROLS	ANTIDEPRESSANTS	CONSEQUENCE OF MOOD ACTION
CELLULAR METABOLISM	✗	✓
HEALING PROCESS	✗	✓
VASODILATATION	✗	✓
REDUCTION OF OXIDATIVE STRESS	✗	✓

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MITOCHONDRIA AND RESPIRATORY CHAIN
PHOTOBIO-MODULATION

COMPARED EFFECTS OF CONVENTIONAL TREATMENTS IN ALGOLOGY AND EFFECTS OF PHOTOBIO-MODULATION WHICH IS, IN FACT, A GLOBAL AND MULTIMODAL PROCESS.

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