

Laser Diode Color Chart

Yellow Laser

Wavelength: 571nm-590nm

Absorption: Mainly Derma

Physiology: IV application stimulates the mitochondrial respiratory chain at complex III (cytochromes). The light electrons stimulate the respiratory REDOX chain leading to phosphorylation from ADP to ATP, leading to an increase in the membrane potential.

Clinical Effects

- Chronic bacterial and viral infections via antimicrobial photo-dynamic therapy
- Lyme disease
- Viral infections (zoster, EBV, herpes)
- Advanced MS
- Squamous cell carcinoma and metastases
- Improves serotonin and vitamin D metabolism
- Improves mood, anti-depressive and digestive effects

Note: Yellow light can be combined with either red or blue light. The 589 nm yellow laser should be used with 50% of max output power. Frequency = 57 Hz.

Red Laser

Wavelength: 621nm-750nm

Absorption: high penetration depth

Penetration Depth: 0.3 mm at 50 mW, 658 nm 2-3CM (best)

Treatment Intensity (W/mW): 90-100mW (up to 50W/cm²)

50 mW for interstitial and intra-articular laser therapies

Physiology: The red/infrared range leads to oxidation of the Cytochrome-C-Oxidase at complex IV, the terminal enzyme of the respiratory chain, the most important photon acceptor. This range activates ATP production leading to increased energy and improvement of cardiac measures and circulation. It's able to support neuronal functions in the CNS and improve immune defenses through its actions on NK, T-helper and T-suppressor cells). Red laser is rejected from erythrocytes but absorbed by leucocytes.

Clinical Effects:

- Improves Cell activity and microcirculation
- Stimulates regeneration of damaged tissues and structures
- Reduces chronic inflammation in joint and spine syndromes
- Stimulates leukocyte groups
- Increases fibroblast activity and wound healing
- Diminishes tendency of aggregation of thrombocytes (In IV therapy)
- Improves immunity through activation of macrophages and releasing cytokines and interferons
- Inhibits platelet aggregation
- Coagulation-inhibiting effect and improves deformability of erythrocytes and stimulates complex IV (cytochrome-C-Oxidase) in the mitochondrial respiratory chain
- Can be used in photodynamic tumor therapy in combination with Chlorin E6 as a photosensitizer

Infrared Laser

Wavelength: 751nm

Absorption: High penetration depth. The longer the laser light waves, the less it is absorbed and the deeper it penetrates the tissue. Infrared is not used for skin

Penetration Depth: 1mm at 8mW, 810 nm 5-7cm (BEST)

Physiology: Increases ATP production by mitochondrial stimulation at complex IV. Infrared light cross-links the hyaluronic acid and binds to Cytochrome-C-Oxide



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Blue Laser

Wavelength: 451nm-495nm

Absorption: Almost completely absorbed at the skin

Penetration Depth: 1-2mm

Physiology:

- When blue light is introduced into the bloodstream, it is readily absorbed by porphyrins and hemoglobin.
- It improves microcirculation and perfusion of oxygen uptake by increasing nitric oxide (NO) production.
- It activates telomerase, inhibiting the degradation of telomeres which are responsible for longevity and predict life expectancy.
- Increases release of hemoglobin-nitric oxide (hBNO)
- Improves ATP metabolism
- Bactericidal, stimulates the respiratory chain at the level of NADH-dehydrogenase
- Destroys a wide range of bacteria in the blood by absorption of bacterial porphyrins and the production of ROS

Clinical Effects:

- Strong anti-inflammatory
- Acute pain reduction
- Wound healing
- Antibacterial, antiviral and antiparasitic
- Used in dental caries and periodontitis
- Acne resolution through the elimination of bacteria
- Improves activation of curcumin as a photosensitizer
- Indicated in H.Pylori due to the bactericide effect of blue monochromatic light that binds to bacterial porphyrins and destroy them by the release of reactive oxygen radicals
- Harmonizes hormones
- Interstitial and intra-articular laser therapy applications

Note: you can combine blue laser with riboflavin as a photosensitizer

Green Laser

Wavelength: 496nm-570nm

Absorption: Almost completely absorbed by the skin, absorbed by hemoglobin

Penetration Depth: 0.1mm at 0.5 mW, 532 nm = 0.5- 1cm

Physiology: When green laser light is introduced into the blood stream, it has readily absorbed by erythrocytes and therefore no green light shining through the vein is observed. Green light binds to hemoglobin and increases oxygen supply by detaching adhesive hemoglobin from the vessel walls. It stimulates sodium-potassium-ATPase of the erythrocyte membrane while stimulating the mitochondria (cytochrome-c-reductase at complex III). Green light leads to steric conformation change of hemoglobin molecules with a 20% increases uptake of oxygen and increases ATP production by approximately 30%.

Clinical Effects

- Strong anti-inflammatory effects
- Effective in pain stemming from swelling and inflammation
- Protects against edema
- Used in ulcers and infectious tumors
- Resolution of acute inflammation
- Increases fibroblast proliferation with an improved effect on glucose metabolism



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