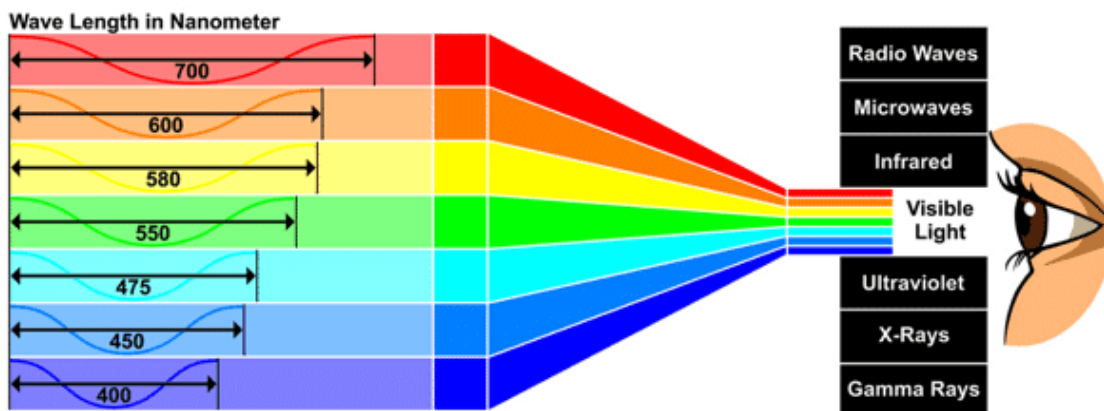


Light Therapy Overview

- Human cells need light to function
- Light Therapy, also called Low Level Laser (Light) Therapy (LLLT), has a wide range of effects on the molecular, cellular, and tissue levels.
- Types of light important for good health include: UV, blue, red, far infrared (FIR) and near infrared (NIR) light.
- Red, FIR and NIR light are superior in their ability to penetrate tissues, blood vessels, nerves, brain, and bones.
- Red, FIR and NIR feed our cells to increase energy production and boost the anti-inflammatory actions of cells.
- Light therapy **health benefits** include:
 - reduces inflammation and tissue edema
 - improves outcome in chronic joint disorders and mechanical spine disorders
 - promotes the healing of wounds, tissue and nerves
 - treats neurological disorders and pain
 - helps with thyroid function, liver regeneration, hot flashes, sleep, depression/anxiety, skin repair, weight, and hair regrowth, etc.

Types of Light

Just as we need air and water and food to function, human cells also need light. Only a narrow range of light is visible to our naked eye.



Five types of bioactive light important for good health include:

#1 Blue Light: Blue light therapy is commonly used to treat sun damage and premalignant or malignant skin cancer growths, to improve skin texture, remove sun spots, acne, and acne scars. It is also used as a treatment for depression, especially seasonal affective disorder (SAD).

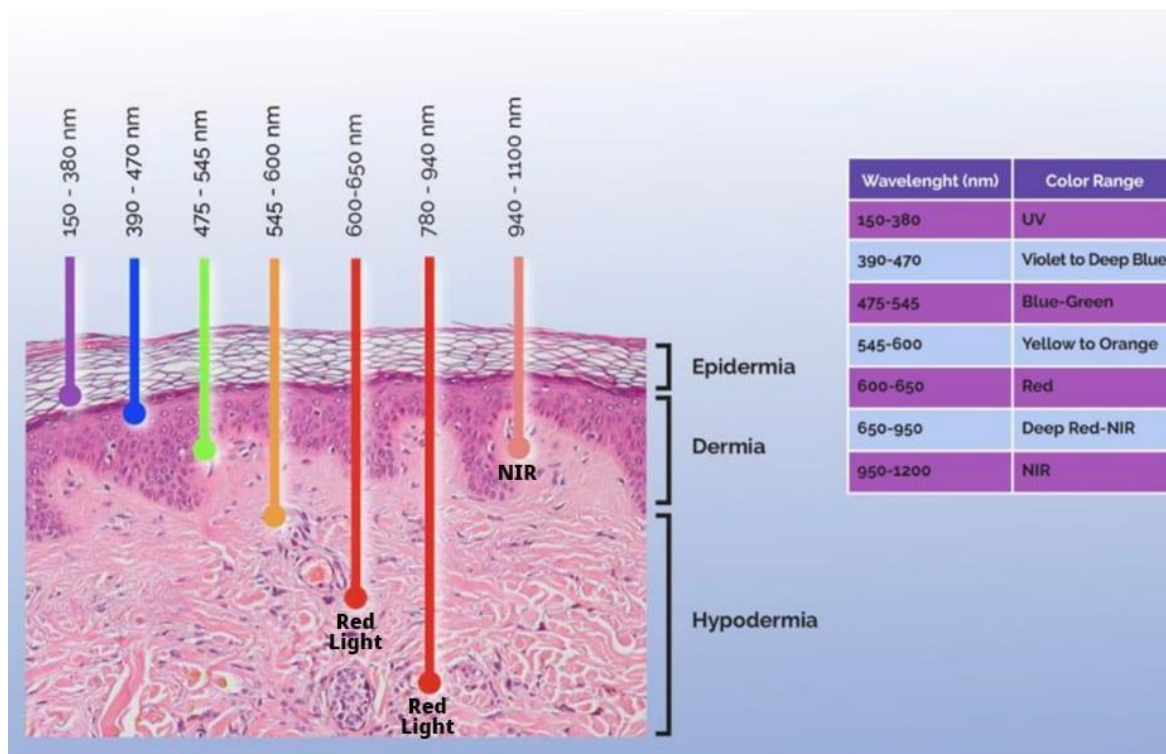
#2 Ultraviolet (UV): Ultraviolet light is important because it helps us make vitamin D in the skin from sunlight, improves mood, and kill pathogens.

#3 Far Infrared (FIR): FIR is what heats you up when you are in the sunlight. FIR changes cellular function and blood circulation. FIR saunas use this to help you sweat without the need to raised the ambient temperature as high as in traditional saunas.

#4 Red light: Red light affects the function of mitochondria, which are the powerhouse of our cells.

#5 Near Infrared (NIR): Like red light, NIR acts on the mitochondria of our cells and helps to increase cellular energy production.

The penetration levels of the various lights vary. **Red light and NIR have the deepest penetration levels.** Red and near infrared light (NIR) have tremendous healing potentials. Their benefits and various applications are one of the most exciting health discoveries of recent decades.



Differences Between Red and NIR Light

Red Light: Red light is visible and occupies what's known as the "long end" of the visible spectrum with wavelengths of 630nm-700nm.

Near Infrared Light (NIR): NIR is invisible and penetrates further than red light. It enters the skin but also goes another 1.5 inches into the body.

How Does Red and NIR Light Therapy Work?

While many wavelengths of light, such as UV, blue, green and yellow are not able to penetrate far into the layers of our skin, red and NIR light has far deeper reach. They can be [more deeply absorbed into our tissues, blood vessels, nerves, brain, and bones.](#)

Red and NIR light enter our body via skin and are then absorbed into cells. Once inside the cells, they “feed” cells to increase:

#1 Energy production: They [increase the production of ATP](#) (Adenosine Triphosphate) which is used to fuel every function in our body.

#2 Boosting antioxidant & anti-inflammatory actions: red and NIR light therapy create a temporary, low-dose metabolic stress (also called “hormesis”), which is exactly what happens when we exercise. In other words, red and NIR “exercise” cells to better health, resulting in a boost to the antioxidant and anti-inflammatory actions of cells. This is why users of red and NIR therapy experience [boosts in cellular health and function, immunity, wound healing, reducing inflammation and improved cell regeneration.](#)

Health Benefits of Red and NIR Light

Red and NIR light do more than just impacting a few enzymes, compounds, or receptors in the body. Here is the list of some of these benefits:

#1 Improves thyroid function and lowers Anti-TPO antibody in Hashimoto’s patients

- [Reduction in Hashimoto’s Anti-TPO antibodies](#) by 39% and reduced dosage of thyroid replacement medication.
- [Decreased medication requirement](#) by 50-75% in people with post-surgical hypothyroidism. Antibodies for Thyroglobulin and TPO were decreased after the treatment.
- In a group of patients the TSH averaged at 9.1 mIU/L, after ten sessions of light therapy, the [TSH was normalized](#) in 97% of these women and averaged 2.2 mIU/L.

#2 Helps with liver regeneration

Liver health is paramount to keeping and restoring good hormonal balance, especially when it comes to thyroid and estrogen issues. A 2010 study showed that liver was regenerated with the help of red and NIR light therapy.

#3 Lowers inflammation in chronic conditions

Inflammation is now recognized as the leading cause of chronic diseases such as autoimmunity, cardiovascular conditions, depression, Alzheimer's, Parkinson's, cancer and chronic fatigue. Studies have shown that red light and NIR have a significant anti-inflammatory effect.

#4 Helps with sleep

A 2011 study found that red and NIR light therapy helped with the increase in melatonin production, and assist with improved sleep.

#5 Relieves depression and anxiety

In a 2009 study, 10 patients with a history of major depression and anxiety (including PTSD and drug abuse) underwent a **single** treatment of NIR light to the forehead. After only 2 weeks, 6 out of 10 patients experienced a remission of their depression, and 7 out of 10 patients experienced a remission of their anxiety.

#6 Reverses skin aging and speeds up skin repair

- Reduce signs of damage, DNA damage, and aging from UV rays
- Reduce wrinkles
- Reduce color patches, hyperpigmentation, and skin discoloration
- Enhance collagen synthesis and collagen density (research has shown it can enhance production of collagen by 31%)
- Accelerate repair in the epithelial layer of the skin
- Combat other skin conditions like acne, keloids, vitiligo, burns, herpes virus sores, and psoriasis
- Speed up wound healing by enhancing skin tissue repair and growth of skin cells

For further evidence of the beneficial effects of red and NIR light therapy on skin, please review 2010 study (Avci et al): "Low-level laser (light) therapy (LLLT) in skin: stimulating, healing, restoring."

#7 Helps with healthy weight

Weight issues, especially weight loss resistance, are multi-factorial. If a person is eating a highly inflammatory diet, is toxic, and chronically stressed, red light therapy can only go so far. However, when combined with other healthy initiatives (diet and movement), red and NIR light therapy has shown some promising results.

#8 Reduces cellulite and improves skin tone

According to a 2011 study, when red and NIR light therapy is combined with massage, it led to an astounding 71% reduction in cellulite.

A 2013 study found that "91% of subjects reported improved skin tone, and 82% reported enhanced smoothness of skin in the treatment area."

#9 Helps hair regrowth

A number of studies have shown an encouraging regrowth of hair in both men and women.

#10 Speeds up wound healing

There is a lot of research supporting the benefit of red and NIR light therapy on wound healing.

#11 Decreases pain, symptoms of fibromyalgia and chronic fatigue

- Low back pain
- Chronic pain
- Joint pain
- Knee and neck pain.
- Fibromyalgia – An impressive body of research is showing that red and NIR light therapy can help fibromyalgia patients. A 2002 study suggests that red and NIR light therapy is *“effective on pain, muscle spasm, morning stiffness, and total tender point number in fibromyalgia and suggests that this therapy method is a safe and effective way of treatment in the cases with fibromyalgia.”*

#12 Regenerates stem cells

Stem cell therapy has come to the forefront of cutting-edge therapeutic modality, and is growing and revolutionizing medicine. It showed how stem cells get regenerated in heart patients in the presence of red light therapy.

Nobel Prize and NASA application

As far back as 1903, a physicist named Niels Ryberg Finsen won the Nobel Prize in Medicine for successfully treating lupus and smallpox with red light.

The biggest leaps forward into research of red and NIR light therapy began in 1993 when NASA investigated ways to boost health for astronauts in space. A study has found that [red and NIR therapy helped to limit the loss of bone and muscle for astronauts](#).

These findings led to hundreds of more studies showing the benefits of light therapy.