

Low Level Laser Light Hair Therapy

To fully understand how laser works, you need to understand the basics of how hair grows and replaces itself in its natural cycle. Every hair on one's head usually grows for several years, an average of 2 to 6. This is called the "Anagen" stage. The root then rests for some weeks. This stage is called the "Catagen" stage. The hair is then shed and a new hair begins to grow. This stage is called the "Telogen" stage. This cycle continues throughout our lives.

Unfortunately, as we get older, some replace fewer hairs than are shed (and/or a thinner, lighter hair) resulting in a thinner hair and gradually baldness occurs. You don't go bald or thin because your hair falls out – it's meant to do so. You go bald or thin out if it doesn't grow back.

Laser light uses the scientific principle of photo-biotherapy. This process occurs when cells absorb light and repair themselves. Laser light penetrates deep into the tissues of the scalp, (it doesn't penetrate bone), stimulating microcirculation of blood supply, cell metabolism and protein synthesizes. Clinical studies suggest that this cellular and sub-cellular activity breaks down the collection of DHT, helping to stop hair loss. Many long-term international clinical research programs have shown that bio-stimulation of 'cold-beam' low-level laser gives numerous positive effects to the skin and hair. Research suggests that laser works by three mechanisms:

- **Energization**, transforming laser energy into cellular energy. Laser light increases the energy available to cells so they take in nutrients faster and get rid of waste products. Not surprisingly, many scientists and physicians have been using low-level laser over the past 30 years to speed wound healing and produce new tissue.
- **Circulation**, increasing blood and lymph circulation through vasodilatation. Microscopic studies have shown laser increases circulation and oxygenation of the blood to the scalp and hair bulb. Laser also removes calcification and blockages around the hair bulb; as well as increases cell replacement activity. Laser helps to improve hair in fullness, shine, body and elasticity. Therefore, problems such as excessively oily or dry scalp, dandruff and itchiness can also be reduced.
- **Vibration**, bringing cells into harmonious oscillation patterns. The soft tissue and fluids in our bodies actually vibrate. They do this within a frequency range similar to that of cold-beam, red light laser. When its vibrations become irregular or out-of-step, it can be brought back into 'synchronization' by being irradiated with low lever laser working at quantum level.

Scientific Studies - In 1964, Professor Andre Mester began experimenting with the use of low-poser laser energy in Budapest, Hungary. He observed that low energy laser exposure has a stimulating effect on the biological system, while high-energy laser

exposure had an inhibiting effect. In his experiments with wound treatment on mice, he noticed rapid healing due to microcirculation of blood supply. This healing was also obvious in laser light treatment of diabetic patients suffering with dystrophic sores. He was amazed to find sores that would not otherwise heal were healed. He also observed accelerated hair growth and thickening of hair in the treated areas. This theory, through its evolution, has since been refined and is widely becoming one of the most popular non-invasive hair loss treatments.

In 1984, Dr. Trelles showed in one study that patients with alopecia areata who were treated with low level laser light showed a good response. Dr. Trelles reported that most of the patients with alopecia areata responded well after only 6 to 8 treatments were administered twice a week for a couple of weeks. In this same study, microscopic evaluation of the hair shaft structure on the alopecia areata irradiated areas showed a clear medulla rich in keratin after treatment. Daily treatments appeared to prevent re-growth, causing irritation with probable increase in hair loss.

In 1992, the 4th annual Meeting of the Japan Laser Therapy Association reported an increase in both hair growth and the density of the hair follicles in the laser treated areas of both male and female clients. Alopecia and Alopecia Areata clients also experienced new growth. Thirty-nine out of forty clients experienced this remarkable re-growth.

The Laser Conference held in Helsinki, Finland in 1993 presented a study of a double blind comparative study with placebo laser for treatment of Hereditary Androgenetic Alopecia in young males. It described the positive effect of Low Level Laser Therapy treatments to stop hair loss, and increase hair shaft tensile strength. All patients but one in this laser treated group showed a complete cessation of hair loss. All patients except three showed a clear hair re-growth with a reduction of at least one category in the Hamilton classification.

Post-treatment showed the dermis with almost the same amount of hair follicles as pre-treatment, although a number of new follicles could be seen with clearly noticeable hair growth. 50% of the follicles were moved into the anagen phase of growth.

When comparing the histological findings, transformation into anagen hair follicles could be observed in 83% of the patients on laser treatment but in none of the placebo patients. Out of 18 patients, 14 showed an increase in hair thickness. In all of the 18 patients, improvement in general hair shaft quality measured with the hair stretcher.

The results showed no improvement in the placebo group or any adverse effects of the treatment.

Professor Pontinen is one of the pioneers of low-level laser hair therapy. In 1996 in Scandinavia, he conducted practical studies on how to apply low-level laser therapy in the treatment of chronic, especially musculoskeletal and myofascial pain and dysfunction, vascular disturbances, wound and ulcer treatment and others.

Professor Pontinen established the beneficial effect of laser hair care on scalp blood flow and published his results. The effects of hair lasers on skin blood flow were measured on three different devices to establish the effect of scalp blood flow. His findings revealed that scalp blood flow was increased by 54%.

Scientific Evidence – The principles of low level laser therapy or photo-biotherapy are as old as sunlight itself. However, harnessing and refining the therapy with low reactive lasers is relatively new. Low Level Lasers are “soft” lasers, often referred to as “cold” laser, and do not have the thermal component to cut, burn or vaporize tissue. Low Level Laser Therapy is based on this scientific principle which occurs when laser light is absorbed by the cells, stimulating cell metabolism that enables damaged cells to repair themselves. Photo-biochemical changes in cells can be achieved only when the correct amount of light energy is delivered at the appropriate wavelength.

Light Energy – Normal white light produces a thermal effect in the skin. This is due to its relatively high-energy output, with a large share of its light in the infrared spectrum being absorbed by the water in the outer cell structure. Laser light, with one specific wavelength, penetrates deep into the layers of skin and is absorbed, provoking a photo-biochemical chain reaction. Laser energy (photons) penetrate deep into these tissues and are absorbed by deeper cell structures, resulting in a photo-biochemical chain of cellular and sub-cellular events. Low-level laser therapy is clinically proven, in European studies, to stimulate these cellular and sub-cellular events, leading to a dramatic increase in microcirculation of blood supplies, cessation of hair loss and stimulation of hair re-growth.

Living cells utilize light and your hair is not different. Laser works by penetrating into soft tissue and increasing the action of adenosine triphosphate, a molecule that is a carrier of energy from one reaction site to another in all living cells.

Laser light increases the energy available to cells so they take in nutrients faster and get rid of waste products. According to the scientist Popp, living cells actually give out ultra weak photons (light) with very similar characteristics as laser.

Popp theorized that soft tissue and fluids in our bodies actually vibrate. They do this within a frequency range similar to that of low-level laser. He postulated that “sick” cells are “light starved” and when irradiated with low level laser in the correct frequency range they became “light-restored” and healthy.

Summing it up. The mechanism of action of low-level laser light on human cells is not completely understood. The interaction of laser light with cells has the basic feature of modulation cell behavior without causing significant temperature increase inside the cells; higher-energy lasers used to treat some types of cancer destroy cancer cells by heating them from the inside. A resulting photochemical reaction inside cells treated with low level laser light may alter physical and chemical properties of molecules important to cellular activities.

In the most recently conducted FDA clinical trials, patients studied were men and women with thinning hair in the scalp area. The patients received two low level laser light treatments per week over a six-month period. Results are as shown:

- 100% of men had stabilization of hair loss in frontal and vertex (top of head) areas.
- 84.6% of men had hair re-growth in the frontal area.
- 82.8% of men had hair re-growth in the vertex area.
- 87.5 of women had stabilization of hair loss in the frontal area.
- 100% of women had stabilization of hair loss in the vertex area.
- 75% of women had hair re-growth in the frontal area.
- 94.4% of women had hair re-growth in the vertex area.

No side effects of low-level laser therapy have been observed. There are no reports of eye damage from exposure to low-level laser light.

Patients with medical conditions such as a history of skin cancer, persistent scalp infections and photosensitivity to laser light were excluded from the study.

In 2007, the FDA approved the LaserMax Hair Comb for the promotion of hair re-growth. On-going clinical studies are currently being conducted that will also approve the hooded laser hair therapy units.

Once a hair root is dead, nothing can be done to restore it. The sooner treatment is started, the better the results will be. Noticeable improvement is achieved in 4 to 6 months. However, if a patient has heavy fall-out, they may notice a reduced rate of daily fall-out after only a few treatments.

Laser is very effective in what is called “self-restoring” hair loss. This is hair loss caused by severe stress, medications, surgery, childbirth or a high fever. Typically, anyone with hair loss due to any of these will only need a few months of Low Level Laser Hair Therapy treatments to see results.

Laser treatments are usually used in conjunction with topical treatments to further augment the effectiveness of both the laser and the products. Results vary from individual to individual but the average patient had better results equal to 20%.

Laser Hair Therapy is a non-surgical therapeutic laser. It is the most powerful laser that is safe for cosmetic purposes and fully complies with FDA standards for safety.

