



With ageing, collagen production below the skin's surface slows down, and as a result, the skin loses elasticity and wrinkles form. However, light-emitting diode (LED) lights, widely used as lighting sources for homes and vehicles have shown promise as a non-invasive remedy for such damage. NASA first discovered the effects of LED lights on cell growth more than 40 years ago. Although their studies have focused on wound healing in space and on Earth as well as plant growth at the space station (rather than on antiageing benefits) their experiments indicated a 150 to 200 percent increase in growth when cells were exposed to LED lights.

What is LED Cold light skin therapy ?

Spectrum LED cold light skin therapy is the latest in non-ablative collagen building for ageing skin. Red LED light (at the correct wavelength) activates collagen so that it renews itself resulting in reduced wrinkles and increased elasticity of the skin.

Blue light at 415 – 425 nm has been shown in various studies to kill acne over a course of several treatments.

Other colours of light are offered by some manufacturers but there is no clinical evidence that green, yellow or any other colour has any beneficial effect.

Skin Rejuvenation

There are two main causes of ageing. Chronological ageing is the effect of time on our body and photo-ageing is a result of the sun's harmful rays.

As we age the amount of collagen below our skin diminishes and the skin becomes less flexible. The result

is drier, thinner skin as our body's natural regeneration process declines and the skin loses its ability to retain moisture. UV in sunlight compounds this issue further.

Therapeutic Wavelengths of Light

Photorejuvenation

LED photons, which are units of electromagnetic radiation, must be absorbed by the cells to produce a reaction. Since each biological system has an optimal spectrum of absorption, both visible red and infrared wavelengths of light deliver the most therapeutic benefits to the skin. Visible red light, transmitted in wavelengths ranging from 620 to 690 nanometres (the greatest absorption is at 620nm and 680nm), can penetrate the skin's surface to a depth of eight to ten millimetres. With their high content of blood and water, the skin's layers can easily absorb red light, which stimulates collagen below, as well as healing on the surface.

Red and infrared wavelengths aimed at the skin bring a number of rewards. Blood flow increases, delivering nutrients and other cellular growth materials to the treatment site. Collagen production is stimulated to strengthen any areas where skin is sagging or wrinkled. Lastly, the lymphatic system opens for improved drainage of toxins. All of these processes result in healthier, more attractive skin. Laboratory studies have found that skin cells grow 150-200% faster when exposed to the correct wavelength of LED light and independent research has shown that infra-red light combined with red light delivers powerful therapeutic effects to living tissue. It is thought that light photons which have been absorbed by the skin and its underlying tissue trigger biological changes within the body in a process known as photobiomodulation. Research is ongoing but we do know that monochromatic light increases oxygen and blood flow which in turn facilitates wound healing.

Acne

P. acnes are one of the main bacteria's responsible for acne. These P.acnes produce porphyrins which are sensitive to different wavelengths of light and if stimulated these chemicals neutralise the bacteria which is clogged in the pores. If there is no bacteria present then the acne will subside very quickly.

There are LED light therapy machines on the market which have different blue lights but the only wavelength of light which will successfully treat acne is 415 – 425 nm.

A combination of blue and red light therapy can have additional beneficial effects than simply using only blue light, as red light has been clinically proven to reduce inflammatory lesions which are often part of the acne. Typically four blue followed by one red treatment gives optimal results.

A typical treatment program is 12 weeks (one treatment per week)

You cannot use blue and red light simultaneously.

The advantages of light therapy over other types of acne treatments are clear:

- No harmful chemicals are applied to the skin
- There is no heat and no pain
- It eradicates the bacteria that causes the acne
- It is your body's natural healing that is stimulated.
- Long term results
- Quick and easy treatment

Wound healing

The healing properties of light have been known for a very long time. In fact red light therapy was first developed for wound healing and the use of red and blue light for photorejuvenation and acne came later. Red light therapy has been used by hospitals for many years for the treatment of, for example, burn victims. Red light at the correct wavelength has been clinically proven to enhance DNA synthesis and to increase cellular tissue regeneration and collagen repair. Infra-red light at 830nm is known to stimulate tissue and collagen.

The use of photosensitisers

LED light therapy has been shown to be more effective with the use of mild PDT (photo dynamic therapy) products. The use of photosensitisers stimulates phototoxic activity which in turn leads to an increase in cellular activity and specific growth factors. These growth factors lead to the stimulation of dermal fibroblasts and keratinocytes that synthesise collagen and elastin. There are various products available on the market for use by beauty salons.

