

## Red Light and Infra-Red therapy

In healthcare and wellness, there are different types of light therapy. They all work on the idea that our bodies have a natural rhythm, kind of like an internal clock. This rhythm can be influenced and changed by using different colors of light. Some health issues, like seasonal affective disorder (SAD), might be connected to changes in the environment and the amount of light we get during different seasons. That's why we can use specific colors of light to help "treat" these conditions.

There's some interesting research showing that not only the changing seasons but also the amount of rain in the month before can affect how people feel, making them more prone to feeling down (O'Hare et al., 2016). Seasonal affective disorder is more common as we get older. Some scientists think this might happen because our body's internal clock, known as the suprachiasmatic nucleus (SCN), can change as we get older, and that could impact on our mood. Another reason might be that as we age, our eyes change, and things like cataracts can block some of the light from reaching our retinas (Ciarleglio, Resuehr, and McMahon, 2011).

When it comes to Seasonal Affective Disorder, which is a type of depression linked to the changing seasons, one way to help is by extending the amount of daylight you get using full spectrum light (Ciarleglio, Resuehr, and McMahon, 2011). But the effects of **red and infrared light** on our health aren't as clear yet.

# The Electromagnetic Spectrum

Here's a picture (Figure 1.) that helps us understand light better. It shows the different types of light and how long their wavelengths are. The harmful UV rays from the sun have shorter wavelengths, and they're even shorter than natural light and infrared light. When the wavelength gets longer, it means the light can go deeper into our body tissues.

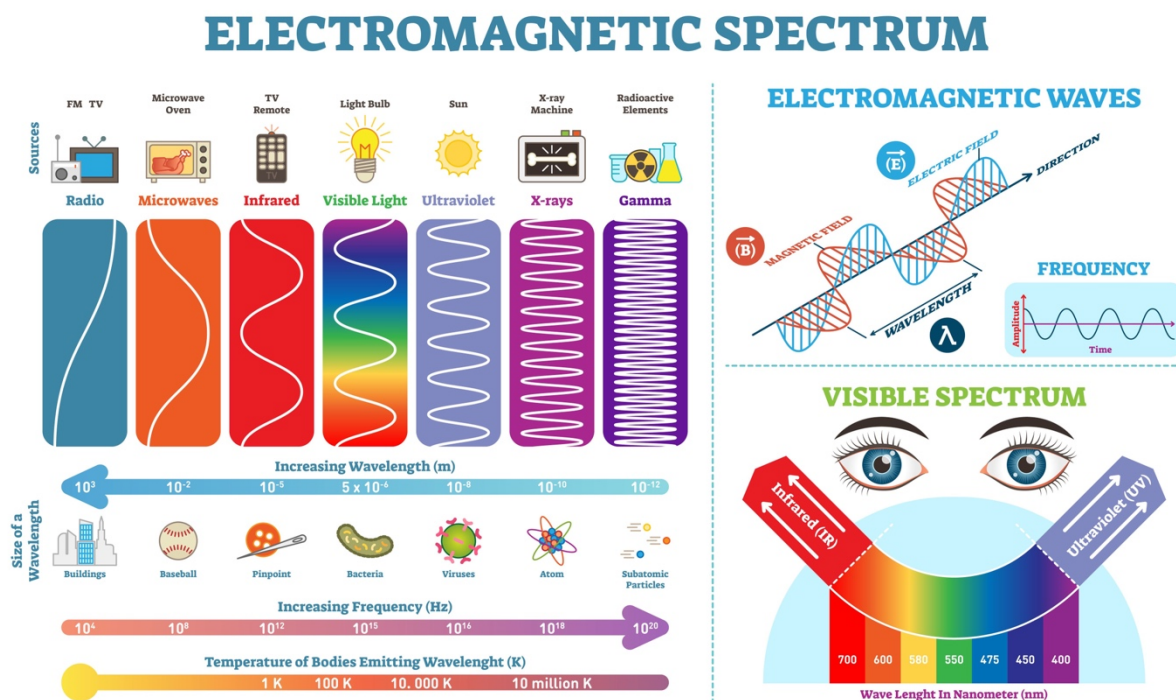


Figure 1: The Electromagnetic Spectrum

## Red Light Therapy

Using red light (Figure 2.) with wavelengths longer than 650nm has proven to be effective in treating skin problems like acne (Wu, Deng, and Huang, 2021). The main side effects reported are some skin irritation and redness. In a study testing red light therapy for acne, it showed a clear benefit (NA and Suh, 2007). In this study, participants received 15 minutes of light therapy twice a day for 8 weeks. This tells us

that the amount of light and how often you use it are important when thinking about the benefits for your skin.

It's safe to say that red light therapy can be good for your skin in general, especially if you have oily skin or acne.

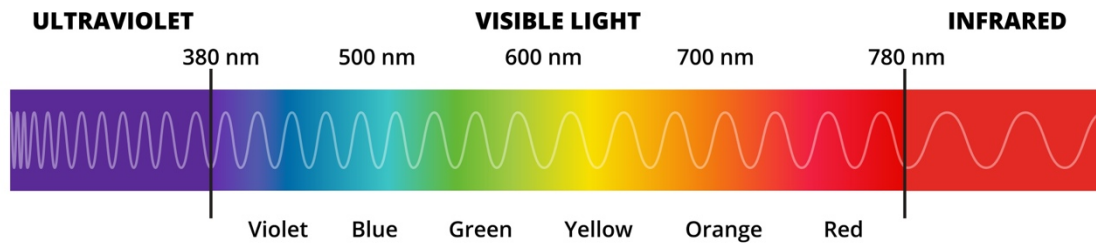


Figure 2. The Infrared Spectrum of Light

### **Possible mechanisms of action of red-light therapy**

One way red light therapy works is by giving a boost to your cell's powerhouses, called mitochondria. When they're more active, it helps your cells work better and encourages the skin to heal faster. It also gets wounded cells moving and helps close up wounds by changing how certain proteins are released by your immune cells (Medrado et al., 2003).

When it comes to red light therapy, using low-level laser therapy with 650-nm light can actually lower the levels of a molecule called tumor necrosis factor  $\alpha$ , which is usually linked to inflammation (Aimbire et al., 2006). So, this tells us that red light therapy could be a good choice for speeding up healing and reducing inflammation.

And here's the interesting part: red light can go deeper into your skin. This is why it's especially helpful for treating acne, but also might be useful in treating conditions such as sport injuries where the light can penetrate into muscles and deeper soft tissues to aid healing and recovery from injury and fatigue.

## **Infra-red therapy and exercise optimisation**

Near-infrared (NIR) light therapy is believed to help muscles work better. It's seen as a promising way to treat both recent and long-lasting muscle injuries (Huang et al., 2009) (Hashmi et al., 2010).

This kind of therapy uses special light-emitting diodes that give off light in the red to infrared range. The light's not too strong, similar to class 3 lasers. In an infrared sauna, the light provides a heating effect. The good things it does for your body happen because the light can go through your skin and reach deeper into your muscles, where it's absorbed by certain proteins in your cells and blood. These proteins are like little helpers, and when they soak up the light, they make your cells grow, fix themselves, and work better (Huang et al., 2009). Scientists call this process "photobiomodulation."

In a randomised controlled trial of NIR therapy, researchers had people put infrared light on their arm muscles for 4 minutes two days in a row. Then they tested their strength. What they found was that using this NIR light therapy before doing exercises helped keep their muscles strong. So, it could be a useful and painless way to improve muscle function when you're recovering from a muscle injury (Larkin-Kaiser et al., 2015). This was a small study with 39 people, but it does show that it could be helpful in exercise medicine. One reason it might work is that the infrared light opens up your blood vessels, and that helps your muscles perform better.

## **Conclusion**

Red light and infra-red light therapy has a number of health benefits and is a valuable aid to any exercise and wellness recovery programme

## Bibliography

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