

THE SCIENCE BEHIND LIFEWAVE

How do LifeWave patches work?

LifeWave non-transdermal patches are phototherapy products that stimulate the skin with light to produce health benefits not obtainable by other approaches. The patches reflect light in the infrared and visible wavelength range to stimulate the body to improve energy production and the flow of energy in the body. Other effects include reduction of pain, reduction of stress, improvement in the duration and quality of sleep, detoxification, reduction in the appearance of lines and wrinkles, and many other general health and wellness benefits.

The Infrared spectrum of light, which includes all radiation between wavelengths just beyond those of the deepest reds of the visible spectrum (700 nm) up to (100,000+ nm (the microwave range), is established to have multiple effects including pain relief properties (Putowski et al., 2016). The infrared spectrum also creates photobiomodulation when applied to the skin of both animals and humans. Research and application of light therapy dates back thousands of years, and today light therapy is a recognized science with many products that function on this basis having been approved for use in medical applications by governments around the world, including the FDA in the United States.

What is photobiomodulation?

Photobiomodulation is the low-power non-thermal delivery of photons in the visible or near infrared spectrum (405–1000 nm) that elicits a beneficial biological response in cells and tissue (Liebert et al., 2017).

Exposure of humans to light "... has been shown that signaling pathways are triggered within the cells, transcription factors are activated, and gene expression patterns are altered. Exposure to photobiomodulation results in key physiological changes – increased anti-inflammatory cytokine levels, decreased pro-inflammatory cytokine levels, upregulation of antioxidants and survival factors, increased cell proliferation and reduced levels of apoptosis (Hamblin, 2016)."

A simple way to understand this is to think about how our bodies respond to sunlight. When we go in the sun, ultraviolet light will cause our body to produce Vitamin D, an excellent example of how a specific wavelength of light will cause a chemical change in our body. By using other wavelengths of light we can achieve other health benefits.

What does photobiomodulation do in the body?

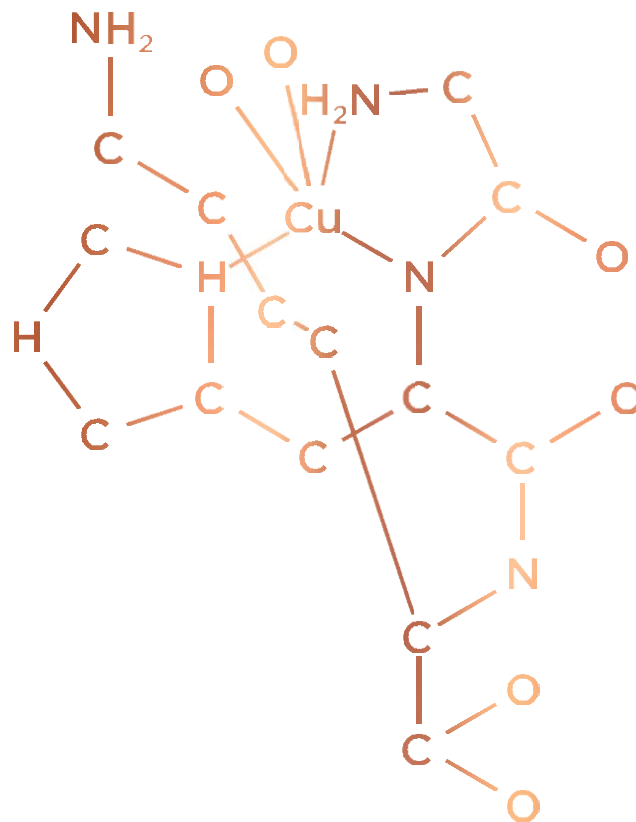
Photobiomodulation:

1. Increases production of multiple antioxidants including glutathione;
2. Increases peptide production and the release of signaling peptides in tissues;
3. Exhibits anti-inflammatory effects and improved pain control;
4. Increases cellular production of energy (ATP);
5. Increases protein synthesis;
6. Regenerates tissues (Vatansever et al., 2012).

Although traditional methods of infrared photobiomodulation are typically based on the use of infrared lamps, lasers, and light emitting diodes as the source of infrared light, many natural materials are also capable of absorbing and reflecting infrared light from a source of light. For example, there are “infrared wraps” commonly used in Japan for pain relief (Vatansever et al., 2012).



What we have done at LifeWave is to use organic materials confined to patches placed on the skin that are capable of absorbing infrared light (body heat) and retransmitting specific wavelengths back into the body. These LifeWave patches are a revolutionary discovery that has been proven to be effective by numerous open-label and double-blind studies completed since 2002. These studies can be found at www.LifeWave.com. This technology has already been proven to reduce pain, improve sleep, increase energy production, improve the appearance of the skin, increase antioxidant levels and increase peptide synthesis. We have now taken LifeWave into the next generation by utilizing this technology to increase the production of a peptide called GHK-Cu, a naturally occurring material in the body proven to activate stem cells in the body.



How has David Schmidt done this?

In the late 1990s until 2002 David Schmidt was an owner in a company involved in developing survival equipment for the US Navy through government contractors. As a result of this work he was invited to be part of a design team for the Navy's next generation mini-sub. This mini-sub was to be manned by Navy SEALs, and a need existed to find a way to improve the energy and survivability of the crew without having to resort to drugs.



Earlier in his career David had conducted energy medicine research at Pace University while pursuing a degree in biology. This research performed in the late 1980s involved the use of electromagnetic equipment of his own design to selectively target and treat neuroblastoma cells. The research was a success and demonstrated that electromagnetic energy, when applied properly, could influence the health and well-being of a cell. David decided that he would continue research along these lines and develop an energy-based product to solve the needs for this project.

It is important to note that research funded by DARPA (Defense Advanced Research Projects Agency) and conducted by Whelan indicated that there were specific wavelengths of infrared light that could initiate elevation of mitochondrial energy (Whelan et al., 2001a, 2001b). Stimulation of mitochondria is important because the mitochondria provide ATP, the basic chemical unit of energy for cells. ATP is the chemical responsible for energy release in injury repair, muscle contraction, peptide production, and pain relief.

“It is generally assumed that the formation of a peptide bond requires at least five ATP. Nevertheless, experimental values suggest a much greater ATP requirement for peptide synthesis or related processes (van Milgen, 2002).” It has been shown in this regard that specific wavelengths of light 633nm and 810-890nm can both elevate ATP production, increase peptide production and produce pain relieving effects. LifeWave patches have been found to emit wavelengths of light in these ranges.

During his investigation of the effects of light on the human body David also learned that research studies had established that the biological effects of light on the body were not specific to devices that produce light. Instead, it is light at specific wavelengths that create the biological effects and not the device which produced it. At first, he experimented with jade, tourmaline and ceramic materials that absorb human infrared energy.

David's breakthrough came when he recognized that the waveforms of infrared and visible light produced by organic materials would match biological structures better than the waveforms produced by inorganic materials or electronic devices.

So, he started experimenting with specific types of organic sugars and amino acids. He created solutions composed of stereoisomers of L-amino acids and D-sugars capable of self-assembly into nano-sized crystals that when activated by body heat emits specific wavelengths of infrared and visible light known to act through phototherapy and photobiomodulation to produce physiological effects in both animals and humans.



“Stereoisomers are isomers that differ in spatial arrangement of atoms, rather than order of atomic connectivity. One of the most interesting types of isomer is the mirror-image stereoisomers, a non-superimposable set of two molecules that are a mirror image of one another. The existence of these molecules is determined by a concept known as chirality. Chirality essentially means ‘mirror-image, non-superimposable molecules’” (http://chem.libretexts.org/Core/Organic_Chemistry/Chirality/Chirality_and_Stereoisomers).

In more detail, isomers are two compounds with the same formula but have a different arrangement of atoms in the molecule and exhibit different properties. It is the unique properties of the use of different isomers along with differently sized nano-crystals in the different patch products that provide LifeWave patches with their different effects.



The LifeWave patches like the X39 patches are manufactured by impregnating a disc of fabric with a proprietary solution of chiral stereoisomers. The impregnated fabric, in turn, is sandwiched and sealed between two films of high-density medical-grade plastic that is impermeable to moisture and other environmental factors. A layer of medical-grade hypoallergenic adhesive is applied to one side of the patches, so that the patches may be easily and conveniently applied to the surface of the skin (Schmidt, 2014).

Chiral stereoisomer molecules are used in the nanocrystal LifeWave patches because these chiral nanostructures are optically active and have photophysical properties (Litvinov, 2016.) "Similarly, to transitions between energy levels in an atom, a photon can be emitted or absorbed during charge carrier transitions between energy levels in nanocrystals (Litvinov, p. 12, 2016)." "The transition frequencies, i.e., absorption or luminescence wavelengths, can be tuned by altering the nanocrystal size. Apart from this, the nanocrystals possess unique optical properties, such as wide absorption spectrum (Litvinov, p. 12, 2016)."

LifeWave patch proprietary formulas are designed to produce differently sized nano-crystals in the different patch products as can be seen in electron micrographs of LifeWave patches produced by Dr. Marc Stuart in 2013. Nanostructures are usually considered as particles less than 100 nm in dimension.

The organically-based optically active nanocrystal mixtures in LifeWave patches operate as localized reflectors that absorb and trap a large part of body heat (wideband infrared emission) and reflect a specific part of the spectrum in a narrow band in the infrared spectrum back to the body.

Research published in 2006 by Tulip and Clark confirmed the principle concept of the patches when these scientists demonstrated that solutions of amino acids would form optically and electrically active molecular crystals.

LifeWave has pioneered the development of this technology that uses structured bio-molecular nano-crystals to emit specific wavelengths of light for the production of photobiomodulation effects in both humans and animals. When a LifeWave patch is placed on the surface of the skin, the technology provides the ability to safely transmit specific wavelengths of light to optimize certain biological functions such as energy production, peptide synthesis, and pain control. These devices are essentially passive transmitters that use organic nano-crystal antennas which have both photonic and electronic (dielectric) properties. The nano-crystal antennas in the LifeWave devices absorb infrared radiation (body heat) in the range of 700-20,000 nanometers and emit light in the infrared and visible spectra back into the body. The small nanometer-size crystals in LifeWave patches exhibit spectroscopic properties, such as light absorption and light emission. "The term dielectric is used to indicate the energy storing capacity of the material (by means of polarization) (<https://en.wikipedia.org/wiki/Dielectric>)."

"A dielectric material is a substance that is a poor conductor of electricity, but an efficient supporter of electrostatic fields -an electrostatic field can store energy. An important property of a dielectric is its ability to support an electrostatic field while dissipating minimal energy in the form of heat. (<http://whatis.techtarget.com/definition/dielectric-material>)."

LifeWave has developed this new technology for energy production, pain management, sleep improvement, peptide production, stress management and, with the X39 patch, production of the peptide GHK-Cu that turns on (activates) stem cells. LifeWave patches can safely be combined with other therapies. In fourteen years with hundreds of thousands of users, there have never been any reports of drug interactions or interference with implantable medical devices such as pacemakers. So by introducing the X39 patch, LifeWave is harnessing the power of stem cells to promote healing.



"No physician in the history of humanity has ever healed a patient. Only the cells of the patient can heal the patient. Only cells know how to close wounds, understand what to do with insulin and how to destroy pathogens. The best a physician can do, is to move obstacles out of the way of cells (e.g., by surgery), supply materials and weapons to the cells (e.g., drugs and building blocks of life) and leave the fight against disease to the cells. Harnessing the power of the cells is the fundamental basis of Regenerative Medicine (DR. JOSEPH PURITA - www.stemcellorthopedic.com)."

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