Near-Infrared and

RED LIGHT THERAPY

MIRACLE MEDICINE

"Penetrating red light is possibly the fundamental anti-stress factor for all organisms."

Dr. Raymond Peat

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MARK SLOAN

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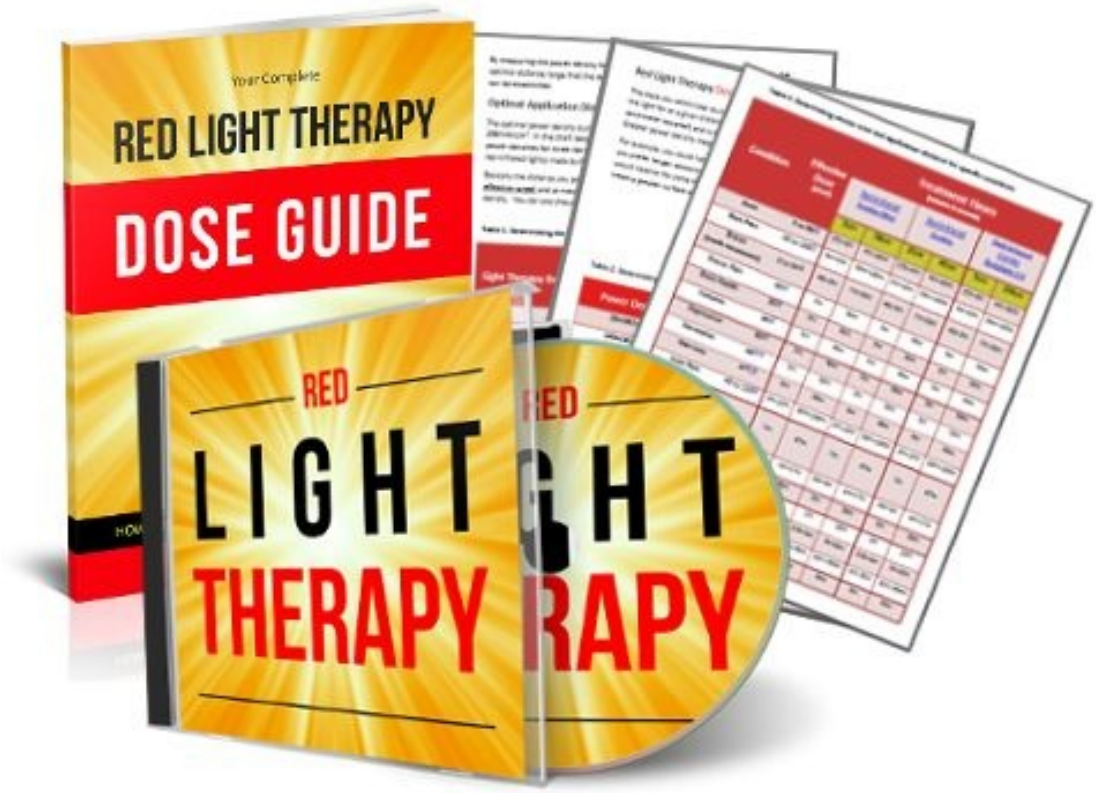

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Red Light Therapy

Miracle Medicine

Mark Sloan

Why You Should Read This Book

Red light therapy is an FDA approved treatment for acne, muscle and joint pain, arthritis, compromised blood circulation,[1] and for reversing hair loss.[2] When you explore the 50,000+ scientific and clinical studies conducted on red light therapy to date, you'll find that no matter which disease a person has, they can probably benefit significantly from red and near-infrared light.

While it was once believed that the healing effects of red and near-infrared light could only be obtained using expensive laser devices, science has since established that inexpensive LEDs (light emitting diodes) of the same wavelengths can provide the same remarkable healing benefits at a fraction of the cost.

Modern Medical Failure

Prescription drugs are the 3rd leading cause of death after heart disease and cancer, according to Danish physician and medical researcher Peter C. Gøtzsche in 2016.[3] But prescription drugs are just one of a number of ways the medical industry kills its customers: Unnecessary surgeries, doctor errors and X-rays are a few more.

It's time to stare the medical industry square in the face and ask the question: Is it helping us or harming us?

A 2000 study by Dr. Barbara Starfield published in the *Journal of the American Medical Association* found that "America's healthcare system is the third leading cause of death."[4] Then in 2003, for the first time ever, Dr. Gary Null and his team of researchers analyzed *all* of the published literature dealing with injuries and deaths caused by mainstream medicine and concluded: "It is now evident that the American medical system is the leading cause of death and injury in the US."[5]

It's plain to see that our medical system is killing us. And if we do nothing about it, it will continue killing us until there's nobody left.

The beautiful thing about acknowledging this fact is that it enables us to begin discovering better treatments and healing strategies to replace the existing ones and build a better world for our children and future generations. Children are our future and we must make their health our number one priority.

The Rise of Natural Therapies

The world is in desperate need of safe and effective ways to heal. Therapies that *actually* work and don't kill people in the process of healing are the goal – and it's my intention in this book to show you that red and near-infrared light therapies are two of our most powerful options.

Note: From this point forth, anytime I refer to 'red light therapy' I am also referring to near-infrared light therapy.

Red light therapy has the potential to largely free humankind from expensive, damaging drugs that don't work - by transferring the power to heal from greed-driven corporations into the hands of the people, where it belongs. As people become more informed and fearless about standing up for themselves and only purchasing treatments that deliver more benefit than harm, we will see the entire world change – quickly and easily – before our eyes. As with any product that sits on a shelf unpurchased, it will eventually cease being produced.

I wrote this book because I've experienced the benefits of red light therapy first-hand, and I now feel compelled to tell the world and help others find the same healing. The repair and enhancement of my brain function, sexual function, thyroid and overall health due to light therapy have been nothing short of miraculous.

Red light therapy isn't a cure for all diseases, but by optimizing cellular function, supporting the immune system and accelerating the healing process, there are probably no diseases or conditions that it cannot benefit.

It's my goal in writing this book to make the most complete resource on red light therapy ever written. One that is based on scientific evidence yet can be easily understood by anybody of any age.

At the end of this book I'm going to give you my personal email and ask that if you have any questions after reading it, please send them to me. Not only will I respond personally with my best evidence-based answer, but I will add it to the Q&A chapter of this book when I publish future editions so that this resource becomes even more complete over time.

It's time to bring the power to heal back into the hands of the people where it belongs, and where it will remain, until the end of time.

Thank you for buying my book. I hope it helps you find the healing you've been looking for.

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DISCLAIMER

The information presented herein is the opinion of the author and is not meant to substitute for medical advice.

Statements made in this book regarding conventional and alternative health treatments have not been evaluated by Health Canada. Do not use this book to diagnose, treat or cure any illness or health condition. If you have, or suspect that you have a medical problem, contact your physician or health care provider.

1. Introduction

Red light therapy is a healing technology that delivers energy to cells by applying a range of visible and invisible wavelengths of light. Other names for red light therapy include low-level laser therapy (LLLT), low intensity light therapy (LILT), phototherapy, photobiostimulation, biostimulation (BIOS), photobiomodulation, photonic stimulation, among others.

Red light therapy has been proven effective for a wide range of conditions including anti-aging, pain relief, cognitive enhancement, fat reduction, smoking cessation, wound healing, increasing bone density, increasing testosterone, reducing anxiety and depression, building muscle, healing acne, preventing hair loss & hair regrowth, and many more indications that we will soon explore in detail.

Near-infrared light is another form of electromagnetic radiation that is similar to red light in both frequency and its beneficial biological effects.

This book is as much about near-infrared light therapy as it is red light therapy. In the coming chapters, I'll outline the differences and similarities between the two. Near-infrared and red light therapies have virtually no adverse side effects and have a mountain of evidence supporting their remarkable therapeutic value.

2. History

Since the dawn of time, the medicinal properties of light have been recognized and utilized for healing. Ancient Egyptians constructed solariums fitted with colored glass to harness specific colors of the visible spectrum to heal disease.

Early use by the Greeks and Romans emphasized the thermal effects of light, and in 1903, Neils Ryberg Finsen was awarded the Nobel Prize in Medicine for successfully utilizing Ultraviolet light for treating tuberculosis.[1] Today, Finsen is recognized as the father of modern phototherapy.

In 1910, American medical doctor John Harvey Kellogg published a book called *Light Therapeutics,* which documented his experiences healing people using incandescent light bulbs and arc lights. Light therapy is effective for treating diabetes, obesity, chronic fatigue, insomnia, baldness, cachexia and many other health problems, wrote Dr. Kellogg in his book.

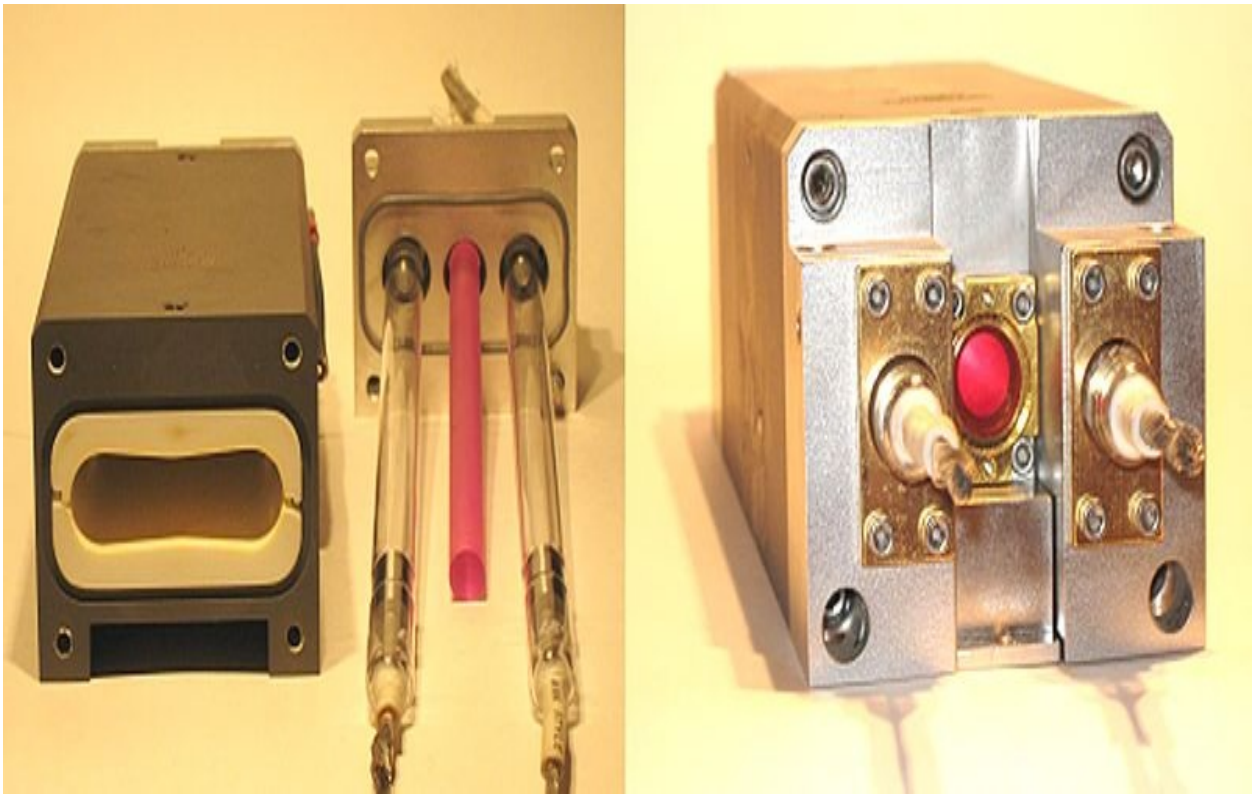
In 1904, two more influential volumes on light therapy were published: *Light energy, its physics, physiological action and therapeutic applications* by Margaret A. Cleaves and *Elements of general radio-therapy for practitioners* by Leopold Freund. All three books mentioned above can be found for free online.

In the decades that followed, interest in the medicinal effects of light faded and was replaced by modern medical drug and surgical based treatments... that is, until the invention of the laser.

The Birth of the L.A.S.E.R (Light Amplification by Stimulated Emission by Radiation)

The laser was invented in 1960 by American Physicist Theodore H. Maiman, but it wasn't until 1967 when Hungarian physician and surgeon Endre Mester (1903-1984) discovered that the laser had significant therapeutic value.[2]

The ruby laser was the first laser device ever built. The image below depicts the ruby laser pumping cavity, both assembled and disassembled.



Working at Semmelweis University in Budapest, Hungary, Dr. Mester accidentally discovered that low-level ruby laser light could regrow hair in mice. During an experiment in which he was attempting to replicate a previous study that found red laser light could shrink tumors in mice, Mester noticed that hair grew back more quickly on the treated mice than on the placebos.[3]

Dr. Mester went on to discover that laser light could also accelerate the healing process in mice.[4] Following this discovery, he founded the *Laser Research Center* at the Semmelweiss Medical University in Budapest in 1974, where he worked for the remainder of his life.

Adam Mester, Dr. Andre Mester's son, was reported in an article by *New Scientist* in 1987 - some 20 years after his father's discovery - to have been using lasers to treat 'otherwise incurable' ulcers. "He takes patients referred by other specialists who can do no more for them," the article reads. "Of the 1300 treated so far, he has achieved complete healing in 80 percent and partial healing in 15 percent."[5]

Interestingly, due to a lack of understanding of how lasers imparted their beneficial effects, many scientists and physicians at the time had attributed it to "magic".

In North America, red light research didn't begin to take hold until around the beginning of the 21st century. Since that time, publishing activity has seen almost exponential growth, particularly within the most recent years.

A quick search on PubMed of the various terms describing light therapy renders over 50,000 published scientific and clinical studies (as of January 2018):

- Phototherapy = 37,785 studies
- Photobiomodulation = 510 studies
- Photostimulation = 1,067 studies
- Lllt = 5,139 studies
- Low-level laser therapy = 5,910 studies
- Near-infrared light = 8,431 studies

Now that we understand more about the history of light therapy, let's look at what exactly red and near-infrared light are.

3. Red and Near-Infrared Radiation

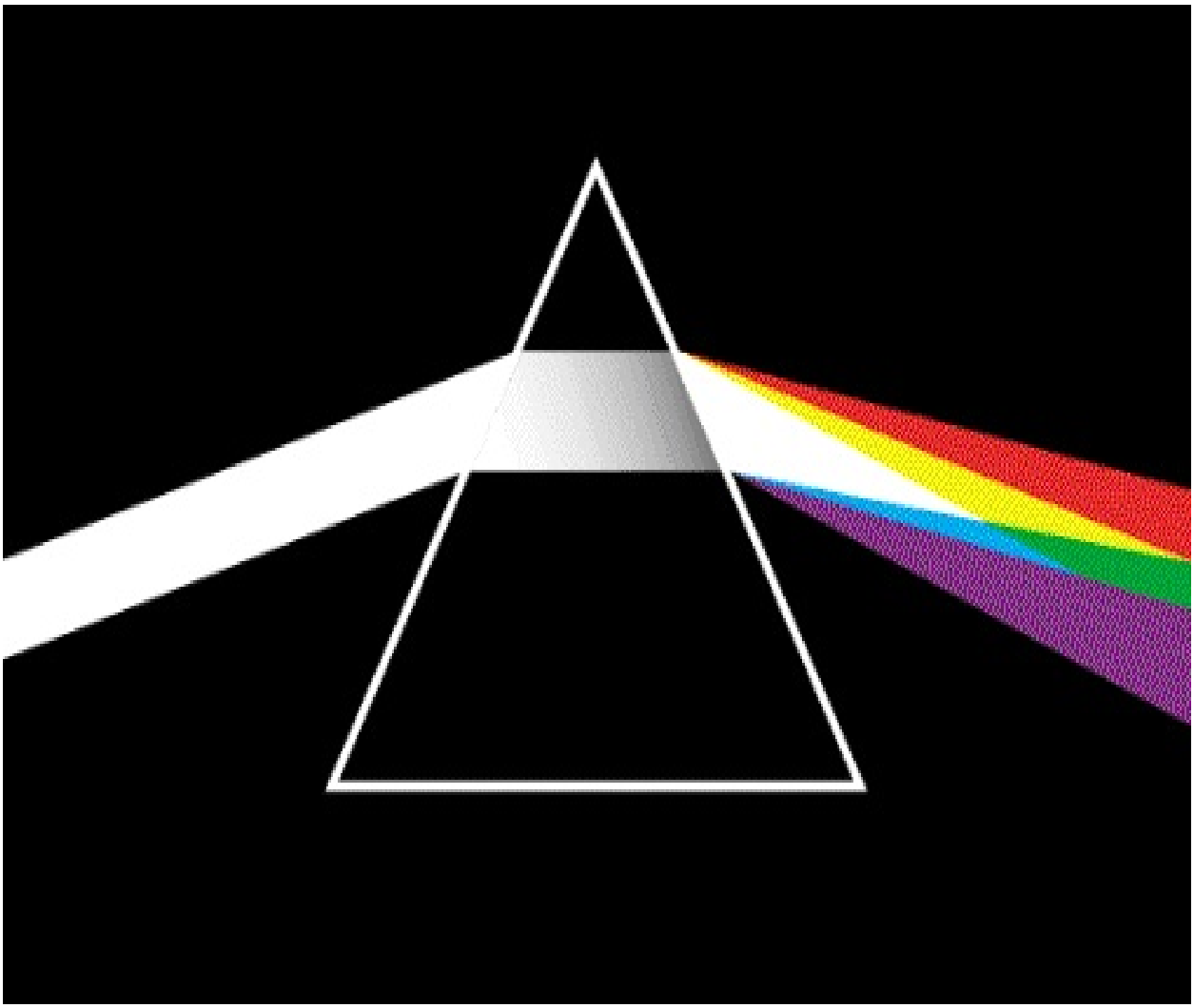
Most people are aware that sunlight is a rich source of UVB radiation, which stimulates the production of vitamin D and protects us from numerous ailments such as autoimmune disorders, various types of cancer and cardiovascular disease.[1]

What most people aren't aware of is the other significant source of therapeutic radiation the sun offers us: Light emitted in the red and near-infrared ends of the spectrum.

While an excess of ultraviolet light can cause sunburn, red and near-infrared light protect the skin from sunburn. Without red/near-infrared light to balance out ultraviolet exposure, ultraviolet light becomes more damaging more quickly.

What is Red Light?

Shine light through a prism and it will fragment into all the colors that makeup the visible spectrum of light, including green, blue, purple, yellow, orange and red.



Red light is a form of radiation that's visible to the human eye, and which we have collectively agreed to call *red*.

Most wavelengths of light, such as ultraviolet, blue or green light, don't penetrate the skin deeply at all and are instead absorbed by the surface layers of skin. Conversely, red light easily penetrates skin, which makes it useful therapeutically for reaching cells and tissues deeper inside the body.

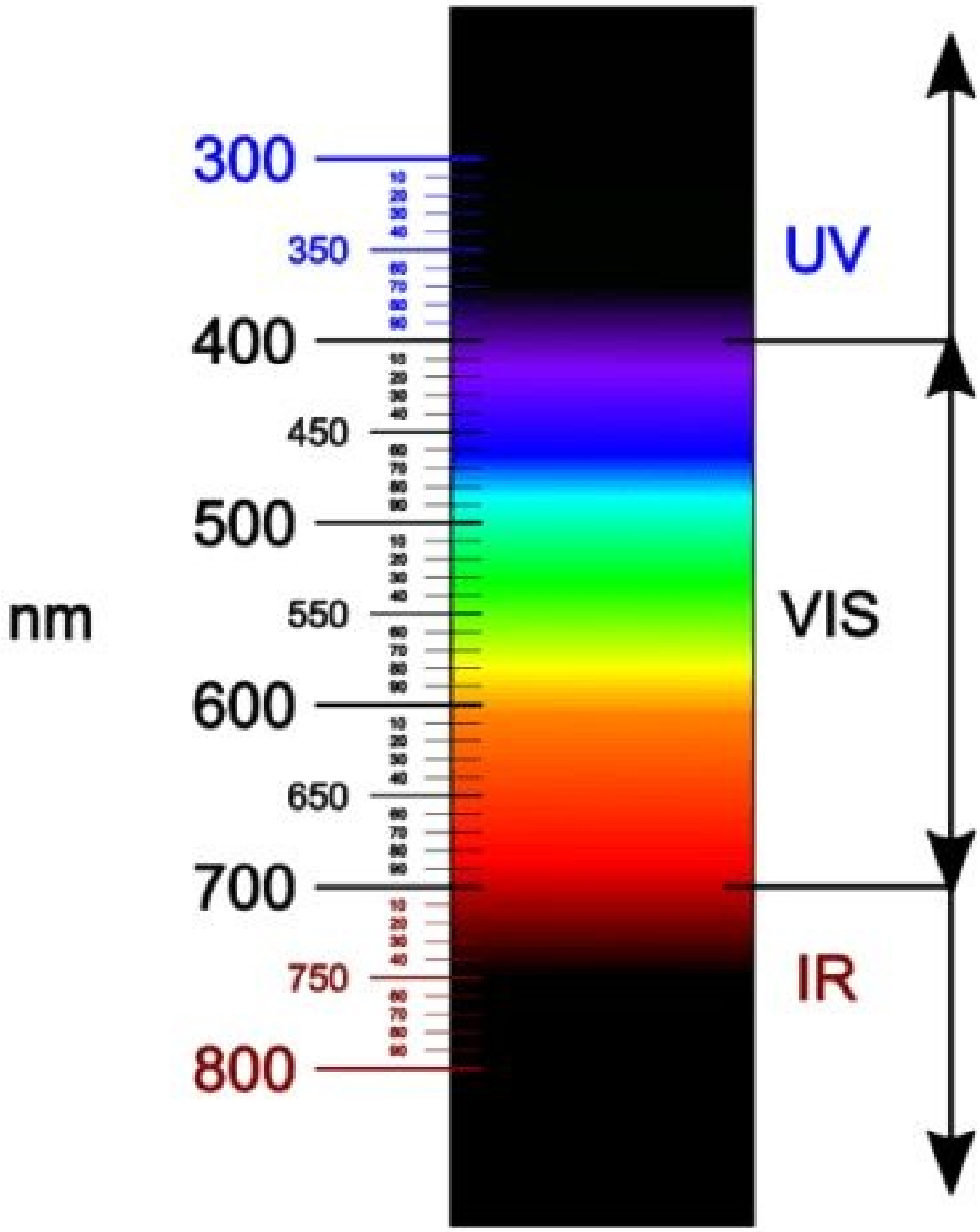
An interesting experiment that you can do yourself to see this effect is one I learned from Finnish health researcher Vladimir Heiskanen in his comprehensive paper on red and near-infrared light therapy.[2]

Simply take out your mobile phone and load the flashlight application. Next, hold the tip of your finger directly against the light and look at your finger. What do you see?

Although your mobile phone flashlight emits blue, green and red light - only the red light penetrates all the way through your finger. Look at that red glow!

Red light ranges in wavelength from about 620-700 nanometers (nm).

The following is a diagram of both visible and invisible wavelengths electromagnetic radiation and the colors they create as perceived by the human eye.


300
350
400
450
500
550
600
650
700
750
800
nm
UV
VIS
IR

What is Near-Infrared Light?

Every time we feel the heat of the sun on our skin or the warmth of a campfire we are experiencing infrared light.

The human eye is limited to seeing wavelengths of light ranging between 400-700 nanometers, and anything below or above that, such as infrared light, remains invisible or light-pink. Interestingly, although invisible to the human eye, the human body can feel parts of the electromagnetic spectrum that cannot be seen, such as infrared.

The infrared spectrum ranges from 700 nm – 1 mm and is actually divided up into near-infrared, middle-infrared, and far-infrared.

There are many conflicting opinions as to where near, middle and far-infrareds begin and end. The following wavelengths are from a paper written by Hong Kong scientist Cheah Kok Wai called *The Fundamentals of Far-Infrared*:[3]

- **Near-Infrared** (also called Infrared-A or IR-A) = 700nm - 1400nm
- **Mid-Infrared** (also called Infrared-B or IR-B) = 1,400nm - 3,000nm
- **Far-Infrared** (also called Infrared-C or IR-C) = 3,000nm - 1mm

The span of infrared most applicable for healing is near-infrared, which ranges from 700nm to 1400nm.

Red vs. Near-Infrared Light

The physiological effects of red and near-infrared light in the body occur in similar ways. For therapeutic applications, the primary difference between the two is that near-infrared light penetrates more deeply into the body than red light, meaning its healing energy can access and thus benefit cells that red light cannot.

While red light is often used for superficial applications like skin treatments, for example acne, near-infrared light can be used for both the skin and to reach tissues residing deeper within the body.

The wavelengths of red and near-infrared light shown to be the most therapeutic in scientific research are as follows:

Red light therapeutic range: 620-700nm
Near-Infrared light therapeutic range: 700-1000nm.

Even within these effective ranges of red and near-infrared light, some wavelengths have been found to be more or less beneficial than others.

Many light therapy devices today emit multiple wavelengths of either red or infrared light and some even combine both red and infrared wavelengths into a single device.

For certain skin conditions, some evidence suggests red light might be more beneficial than near-infrared light. For all practical purposes, near-infrared light or a combination of red and near-infrared light is probably ideal.

I use a light therapy device with a combination of red and near-infrared LEDs because that way I receive the best of both worlds; a 50/50 application of visible red and invisible near-infrared light. I love watching the room light up with red light during treatment, which is one of the reasons I prefer a combination device over solely near-infrared light.

4. The Science of Light Therapy

Over the past 100 years, infrared and red light therapies have been studied extensively on human beings and many other animals for dozens of diseases and conditions. For example, rats,[1] mice,[2] rabbits,[3] mini-pigs,[4] dogs,[5] monkeys,[6] pigs,[7] sheep,[8] horses,[9] cows,[10] cats,[11] sand rats,[12] gerbils,[13] guinea pigs,[14] frogs,[15] bumblebees,[16] fruit flies,[17] sea urchin larvae,[18] snails,[19] roundworms,[20] earthworms[21] and flat worms.[22]

Since the cellular metabolic processes for humans and other creatures are very similar, the health benefits are often similar or uniform among different species.

The following is a list of diseases and conditions which scientific evidence shows can benefit from red and near-infrared light. Some of these studies have been well-established through scientific reviews and meta-analysis and others are said to be controversial and more research may be necessary.

- Achilles Tendinitis[23-24]
- Achilles Tendinopathy[25-26]
- Acne[27-29]
- Addiction[30]
- Amblyopia[31]
- Age-Related Macular Degeneration[32-33]
- Alzheimer's Disease[34]
- Aphthous Ulcers[35-37]
- Bell's Palsy[38-40]
- Bone Fractures[41-43]
- Burn Scars[44]
- Burning Mouth Syndrome[45-46]
- Carpal Tunnel Syndrome[47-48]
- Cellulite[49]
- Chronic Joint Disorders[50]
- Cognitive Enhancement[51-54]
- Cold Sores (herpes labialis)[55-56]

- COPD[57]
- Dental Implant Stability[58]
- Dentin Hypersensitivity[59]
- Depression[60-62]
- Diabetic Foot Ulcer[63-64]
- Dry Mouth (xerostomy)[65-67]
- Dysmenorrhea[68-69]
- Elbow Tendinopathy (Tennis Elbow)[70]
- Exercise Performance and Recovery[71-75]
- Fibromyalgia[76-77]
- Frozen Shoulder[78]
- Glaucoma[79]
- Hair Loss (alopecia)[80-81]
- Hand-foot-and-mouth disease[82]
- Hypothyroidism[83-85]
- Lichen Planus[86]
- Low Back Pain[87-89]
- Lymphedema[90-92]
- Maxillary Sinusitis[93]
- Meniscal Pathology[94]
- Muscle Growth[95-96]
- Muscle Pain[97]
- Neck Pain[98-99]
- Neuropathic Foot Ulcer[100]
- Nipple Pain (from Breastfeeding)[101-102]
- Obesity[103-105]
- Oral Mucositis[106-108]
- Orthodontic Pain[109-111]
- Orthodontic Tooth Movement[112]
- Osteoarthritis[113-115]

- Osteoporosis (Bone Loss)[116-117]
- Pain[118-119]
- Periodontitis (Gum Disease)[120]
- Postherpetic Neuralgia[121]
- Pressure Ulcer[122-123]
- Radation Dermatitis[124-126]
- Raynaud's Phenomenon[127]
- Restenosis[128]
- Rheumatoid Arthritis[129-131]
- Shoulder Tendinopathy[132]
- Skin Aging[133-134]
- Sternotomy Incision Repair[135-137]
- Stroke[138-140]
- Sunburn Prevention[141]
- Temporomandibular Disorders[142]
- Tendinopathy[143]
- Testosterone Deficiency[144]
- Toenail Fungus[145-147]
- Traumatic Brain Injury[148-149]
- Venous Leg Ulcers[150]
- Vitiligo[151-152]
- Wound Healing[153-155]

Despite the immense number of scientific papers published on red and near-infrared light, there is still much to be learned and research at universities and other institutions continues.

5. Top 10 Proven Benefits

Now that you've seen the long list of diseases and conditions that red and near-infrared light therapy can benefit, let's go a little more in depth into some of them.

Here is my top 10 list of some of the most common ailments that can be resolved using red and near-infrared light.

10. Melt Your Belly Fat

According to the Centre for Disease Control (the CDC), more than one-third (36.5%) of U.S. adults are obese. Obese people have an increased risk of a number of conditions including heart disease, stroke, type 2 diabetes and cancer, so correcting this condition is vital for long term health.[1]

Another benefit of fat reduction in an obese person is the money saved on medical costs every year. How much money? The medical costs for people who have obesity are $1,429 higher per year than those of 'normal' weight.[1]

There are no shortages of people, programs and devices claiming they can reduce your weight – but we all know many of them turn out to be fraudulent and don't actually work. Others can help you lose weight but they do so in ways that are excessively stressful and unhealthy. Can red and near-infrared light therapies help you safely burn fat?

In 2015, a team of researchers from the Federal University of São Paulo, Brazil tested the effects of near-infrared light (808nm) on 64 obese women randomly assigned to one of two groups: Exercise (aerobic & resistance) training + phototherapy or exercise (aerobic & resistance) training + no phototherapy. The study took place over a 20 week period, during which both groups of obese women underwent exercise training 3-times a week. At the end of each training session, one group of women received light therapy and the other did not. The results?

Remarkably, the women who received the near-infrared light therapy following exercise *doubled* the amount of fat loss compared to exercise alone. Additionally, the women in the exercise + phototherapy group were reported to have a greater increase in skeletal muscle mass than the placebo group.[2]

Other studies have reported similar findings in obese people who combined exercise with red light therapy,[3-4] but even studies that didn't include exercise have reported significant fat reduction from light therapy alone.[5-6]

Scientists from George Washington University conducted an independent physician-led trial in 2013 to test the ability of red laser light (635nm) to reduce fat on the waist, hips and thighs of obese individuals. Laser treatments were administered to 8 obese patients and consisted of 20 minute sessions every second day for two weeks. When researchers assessed the patients three weeks after the trial began (one week after treatments ended) the results were remarkable. "Compared with baseline, a statistically significant 2.99 in. (7.59 cm) mean loss was observed at the post-procedure evaluation point ($P < 0.0001$)." **Translation:** Patients lost 3 inches of fat in just two weeks of red light therapy treatment.[6]

9. Accelerate Wound Healing

Whether it's from an accident during physical activity or chemical pollutants in our food and environment, we all sustain injuries regularly. Anything that can help accelerate the body's innate healing process will free up resources and allow it to focus on maintaining optimal health.

Dr. Harry Whelan from the Medical College of Wisconsin has been studying red light in cell cultures and on humans for decades. His work in the laboratory has shown that skin and muscle cells grown in cultures and exposed to LED infrared light grow 150-200% faster than control cultures not stimulated by the light.[7]

Working with Naval doctors in Norfolk, Virginia and San Diego California to treat soldiers injured in training, Dr. Whelan and his team found that soldiers with musculoskeletal training injuries who were treated with the light-emitting diodes improved by 40%.[7]

In 2000, Dr. Whelan concluded, "The near-infrared light emitted by these LEDs seems to be perfect for increasing energy inside cells. This means whether you're on Earth in a hospital, working in a submarine under the sea or on your way to Mars inside a spaceship, the LEDs boost energy to the cells and accelerate healing."

A review of the scientific literature reveals there are literally dozens of other studies evidencing the powerful wound-healing benefits of red light.[8]

In 2014, a group of scientists from three universities in Brazil conducted a scientific review of the effects of red light on wound healing. After reviewing a total of 68 studies, most of which were conducted on animals using wavelengths ranging from 632 to 830 nm, the study concluded "…phototherapy, either by LASER or LED, is an effective therapeutic modality to promote healing of skin wounds."[9]

8. Increase Bone Density

Bone density and the ability of the body to build new bone is important for people recovering from injuries. It's also important for elderly people since our bones tend to progressively become weaker with age. The bone-healing benefits of red and near-infrared light have been demonstrated in many laboratory studies.

In 2013, researchers from São Paulo, Brazil studied the effects of red and near-infrared light on the healing of rat bones. First, a piece of bone was sliced off the upper leg (osteotomy) of 45 rats, which were then split into three groups: Group 1 received no light, group 2 was administered red light (660-690nm) and group 3 was exposed to near-infrared light (790-830nm).

The study found "a significant increase in the degree of mineralization (gray level) in both groups treated with the laser after 7 days" and interestingly, "after 14 days, only the group treated with laser therapy in the infrared spectrum showed higher bone density."[10]

Here are a few more studies on light therapy for bone health and their conclusions.

2003 study conclusion: "We conclude that LLLT had a positive effect on the repair of bone defects implanted with inorganic bovine bone."[11]

2006 study conclusion: "The results of our studies and others indicate that bone irradiated mostly with infrared (IR) wavelengths shows increased osteoblastic proliferation, collagen deposition, and bone neoformation when compared to nonirradiated bone."[12]

2008 study conclusion: "The use of laser technology has been used to improve the clinical results of bone surgeries and to promote a more comfortable postoperative period and quicker healing."[13]

Near-infrared and red light therapies should be the first line of treatment for anybody who breaks a bone or incurs any kind of injury to enhance their recovery.

7. Increase Testosterone

Throughout history, the essence of a man has been linked to his primary male hormone testosterone. At around the age of 30, testosterone levels begin to decline and this can result in a number of negative changes to a man's physical and mental health and wellbeing: reduced sexual function, low energy levels, reduced muscle mass and increased fat, among others.[14]

When you factor in the endless environmental contaminants, stress and poor nutrition that are so common today, it's no surprise that we are seeing an epidemic of low testosterone in men the world over.[15]

In 2013, a group of Korean researchers studied the impact of testicular exposure to red (670nm) and near-infrared (808nm) laser light. The 30 male rats were split up into three groups: a control group and two groups that were exposed to either the red or near-infrared light. At the end of the 5-day trial, while untreated rats had no increase in testosterone, rats exposed to one 30-minute treatment of light therapy per day had significantly elevated testosterone levels. "…Serum T level was significantly increased in the 808nm wavelength group. In the 670 nm wavelength group, serum T level was also significantly increased at the same intensity of 360 J/cm2/day," concluded researchers.[16]

6. Enhance Brain Function

Nootropics (pronounced: no-oh-troh-picks), also called smart drugs or cognitive enhancers, have undergone a dramatic spike in popularity in recent years and are being used by many people to enhance brain functions such as memory, creativity and motivation.

The positive effects of red light on brain function are significant and well established scientifically. In fact, light in the red and near-infrared spectrums could very well be the most powerful nootropic ever discovered. Let's look at some evidence:

Researchers from the University of Texas applied near-infrared laser light to the foreheads of healthy volunteers and measured its effects on cognitive parameters, including attention, memory and mood in 2013. The treated group

experienced improvements in reaction time, memory and an increase in positive emotional states for the two-week follow-up period after treatment. "These data imply that transcranial laser stimulation could be used as a non-invasive and efficacious approach to increase brain functions such as those related to cognitive and emotional dimensions," wrote scientists.[17]

Another study investigated the effects of near-infrared laser light on the brain both individually and in combination with aerobic exercise. Compared to the control group, which didn't receive the light or the exercise, the American researchers concluded that phototherapy had brain-boosting effects similar to the exercise.[18]

5. Eliminate Anxiety and Depression

Depression affects 121 million people worldwide,[19] and that's only the number of people *officially* diagnosed with it. The truth is we all experience depression at some point in our lives.

A 2017 study on the mental health status of Americans found that more people than ever are suffering from serious mental health disorders.[20] That's 8.3 million American adults suffering from serious psychological distress, including feelings of sadness, worthlessness and restlessness.

University students – the ones who are supposed to be our smartest and healthiest leaders-of-tomorrow – experience significantly higher rates of depression than your average population, according to a 2012 scientific review.[21]

Even more troubling: "Depression is associated with high suicidality," wrote scientist M.S. Reddy in 2010. "About 50% of individuals who have committed suicide carried a primary diagnosis of depression," continued Reddy.[19]

Anxiety is even more common than depression – it's the most common mental illness in the U.S. – affecting 40 million adults age 18 and older (18.1%).[22]

Existing medical treatments for anxiety and depression are toxic, tend to numb people out, and have even been implicated in causing aggressive and suicidal behavior. Clearly new and effective therapies are desperately needed to curb anxiety, depression and today's alarming rate of suicide.

Just imagine how much better life would be if everybody had a way of effectively eliminating their anxiety and depression.

Can light therapy help?

In 2009, a group of scientists from Harvard University tested the effects of near-infrared light on 10 subjects with major depression. Researchers applied the light directly to the forehead of patients in *a single session* totaling 16 minutes of light exposure. After just one treatment with near-infrared light, "Patients experienced highly significant reductions in both HAM-D [depression] and HAM-A [anxiety] scores following treatment, with the greatest reductions occurring at 2 weeks."[23]

Translation: Near-infrared light therapy resulted in long-lasting reductions in depression and anxiety from just one treatment.

4. Eliminate Acne Vulgaris

Acne is the most widespread skin condition in the U.S., affecting up to 50 million Americans annually.[24]

People react differently to the presence of acne on their face and body, but it often results in poor self-image, depression anxiety and many times permanent physical scarring of the skin.[25]

A 2001 experiment from Queens Medical Center in Nottingham, UK found that acne was prevalent in 50% of adolescents and had "considerable impact on emotional health in this age group."[26]

Can light therapy help?

Iranian scientists compared the effects of red (630nm) and near-infrared (890nm) laser therapy on 28 patients with facial acne in 2012. Participants in the study were given light therapy on their face 2-times per week for 6 weeks and their skin conditions were then assessed. Ten weeks after treatment acne lesions were found to be significantly decreased in those treated with the red light, but the decrease wasn't significant with the near-infrared light.[27]

3. Relieve Pain

America is a nation in pain, according to a 2015 study by researchers at the National Institutes of Health. How much pain?

Nearly 50 million American adults (11.2%) reported experiencing pain daily for the previous three months.[28]

Some of the most common pain medications that people reach for when they are feeling pain are Tylenol, Ibuprofen or other drugs classified as Non-Steroidal Anti-Inflammatory Drugs (NSAIDS). Interestingly, all of these common painkillers have been shown to cause heart attacks, strokes and cancer, except aspirin, which actually reduces the risk of these same complications. In 2015, the FDA issued a strong warning that all NSAIDs except aspirin can trigger heart attacks and strokes.[29]

In other words, people experiencing pain are using medications which are slowly killing them. It's clear that better treatments are needed to reduce the chronic pain people are experiencing.

Here are the conclusions of a few recent publications on pain reduction using therapeutic red and near-infrared light:

2006 systematic review: "There is strong evidence that LLLT [low-level laser therapy] modulates the inflammatory process and relieves acute pain in the short-term."[30]

2009 systematic review published in *The Lancet*: "We show that LLLT reduces pain immediately after treatment in acute neck pain and up to 22 weeks after completion of treatment in patients with chronic neck pain."[31]

2014 review: "[red and near-infrared] Laser causes pain relief without any side effects."[32]

2. Regrow Hair on a Balding Scalp

Hair loss (alopecia) is a very common disorder, affecting more than 50% of the worldwide population.[33]

In the United States, an estimated 35 million men and 21 million women suffer from some form of hair loss, and around 40% of men will have noticeable hair loss by the age 35.[34]

To date there are only two FDA-approved synthetic drugs for hair loss available from your doctor: Propecia and Rogaine. Both of these drugs have a less than 50% success rate, and their side effects can be severe.[35]

Hair transplants are another option, but they come with a long list of unwanted side effects including itching, pain, bleeding, swelling, infections, etc. and like the drug treatments, its efficacy is questionable.

“I only have to venture to a major street in San Francisco to find that if there were an ‘effective’ treatment for baldness, a majority of men are either not aware of it, or are choosing to be bald,” wrote hair-loss researcher Danny Roddy.[36]

American and Hungarian researchers conducted a review in 2014 of studies involving the treatment of hair loss with red and near-infrared laser therapy. The review reports that red and near-infrared laser therapies have been demonstrated to stimulate hair growth in both mice and in men and women in a number of controlled clinical trials. “LLLT for hair growth in both men and women appears to be both safe and effective. The optimum wavelength, coherence and dosimetric parameters remain to be determined,” they concluded.[33]

1. Heal Arthritis

Arthritis is a crippling ailment from which many people worldwide suffer. An estimated 22.7% of US adults were diagnosed with some form of arthritis between the years 2013-2015. That’s almost 55 million people who could benefit from an effective treatment for the condition.[37]

Currently, there are dozens of different FDA-approved drugs for arthritis, all of which come with limited successes as well as their own set of unwanted side effects. Red and near-infrared light therapies can effectively treat arthritis and have virtually no unwanted side effects.

Dr. Michael R. Hamblin, Harvard professor from the Department of Dermatology, published a study in 2013 titled *Can Osteoarthritis Be Treated with Light?* - which experimented with the application of near-infrared laser light (810nm). Remarkably, after inducing arthritis in the rats and treating them just *one time* with the near-infrared laser, inflammation was found to be significantly reduced in just 24 hours. “A single application of LLLT produced significant reductions in inflammatory cell infiltration and inflammatory cytokines 24 hours later.”[38]

What book on light therapy would be complete without addressing the one disease that threatens human existence more than any other?

6. Light Therapy for Cancer

In 2017, I published my book *Cancer Cured*. The book took over 3 years to write, includes over 2300 scientific and clinical references and is the most complete investigation into cancer ever written. I highly recommend you to read it. Nobody has to die of cancer anymore. All the scientific research needed to prevent and heal cancer has already been completed. It's up to you to empower yourself with the knowledge needed to never die of cancer.

Below my challenge was to as accurately yet briefly as possible describe the cancer problem as I see it and then explain how red light therapy may be a useful tool for preventing and reversing it.

The Cancer Epidemic

Governments of the world tell us that 50% of people alive will develop cancer at some point in their lives. The scariest thing about that estimate by far is the fact that if we are diagnosed with cancer, the treatments our doctors will offer us can double as weapons of war.

We've all seen at least somebody in our lives undergo surgery, chemotherapy and radiotherapy and then come out in far worse health than before. I saw it happen to my mother when I was 12 years old, and like many people who receive these treatments, her last days were spent in agonizing pain.

It's common sense that cutting a sick person with a knife, injecting poison into their bodies, and burning them with the same ionizing radiation emitted by a nuclear bomb will make their health worse. Our own human experience has validated this on endless occasions and it's time to be honest about it and learn from history, before it's too late.

"My studies have proved conclusively that untreated cancer victims live up to four times longer than treated individuals. If one has cancer and opts to do nothing at all, he will live longer and feel better than if he undergoes radiation, chemotherapy or surgery, other than when used in immediate life-threatening situations."

- Dr. Hardin B Jones, professor of medical physics at the University of California, Berkeley and leading US cancer statistician for over 30 years, 1969

Cancer: The Metabolic Disease

The biggest myth being taught by the cancer industry is that a cancer cell is some kind of microscopic terrorist with an intent to kill people.

This concept is about as real as The Loch Ness Monster or the legendary Chupacabra: No scientific evidence has ever suggested that cancer cells or tumors have any intention of killing anyone.

Furthermore, *The National Cancer Institute's* own billion-dollar initiative, which began in 2005 and was titled *The Cancer Genome Atlas Project*, has proven to be a complete and utter failure: Not a single gene mutation - or any combination of mutations - was found to be absolutely responsible for initiating the disease.[1-5]

This is because cancer is not a genetic disease.

It's been almost 100 years since Nobel Prize-Winning scientist Dr. Otto Warburg discovered that a cancer cell was a cell with damaged mitochondria – a tiny organelle within cells that is responsible for energy production.[6] A 'cancer cell' is a metabolically defective, injured cell in need of repair.

After *The Cancer Genome Atlas Project* proved once-and-for-all that cancer is not a genetic disease but a metabolic one, James Watson - the "father of DNA" himself - recommended a shift in the focus of cancer research from genetics to metabolism.

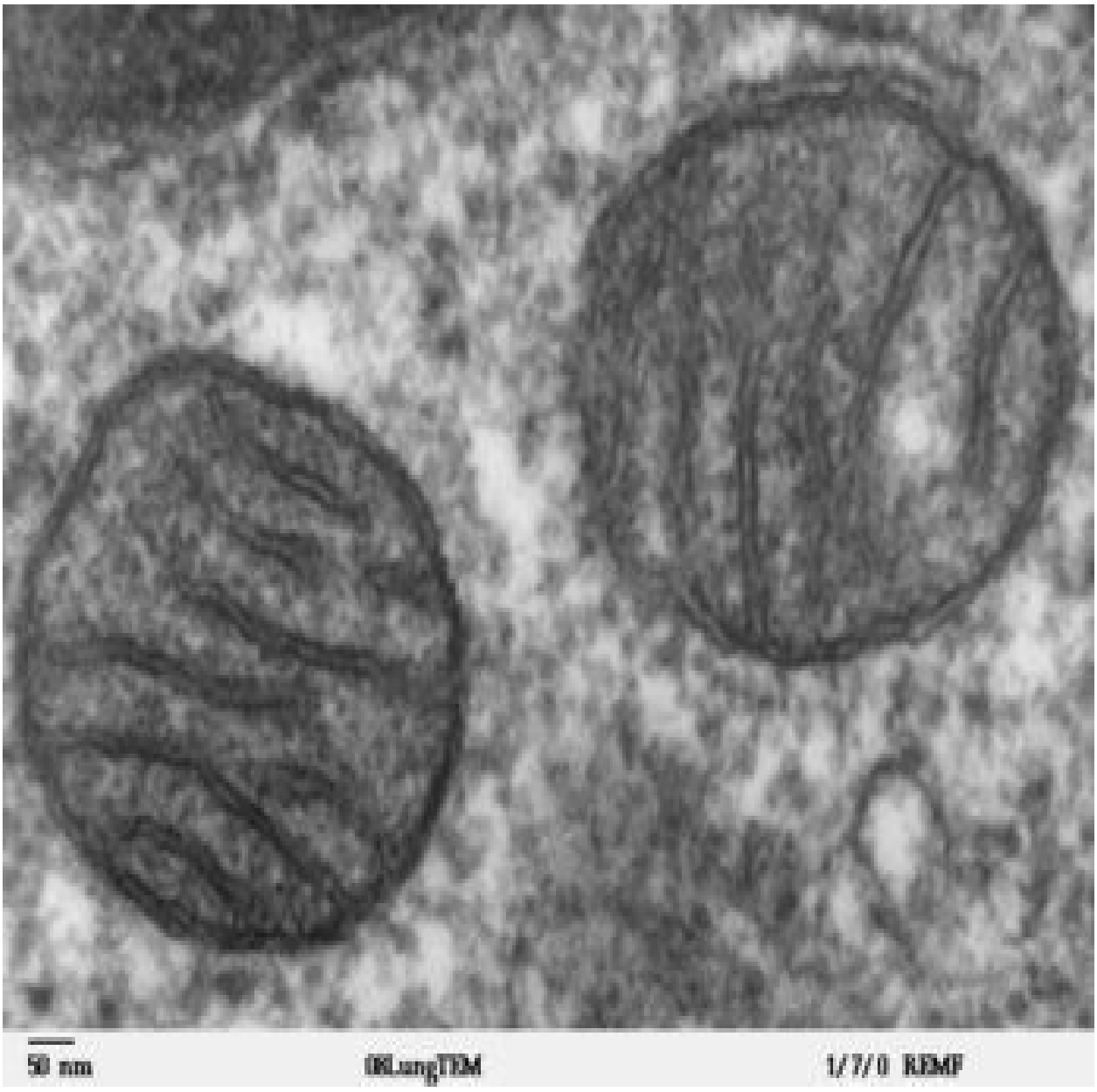
Having a basic understanding of cellular metabolism and how to repair metabolic defects will empower the individual to enhance their body's own natural healing process and say goodbye to cancer forever.

In the next chapter, I will show you red light's effects on cellular metabolism and how it can be used to accelerate healing in cancer and other diseases.

7. How Does Red Light Heal?

Every one of the estimated 37.2 trillion cells[1] that make up the human body contain tiny structures within called mitochondria. These organelles are responsible for energy production by the cell, in a process called metabolism.

Figure 1. The following image depicts two healthy mitochondria floating inside a mammalian lung cell, photographed via a transmission electron microscope.



When a cell is given everything it needs to metabolize properly – a process

involving the chemical oxidation of glucose into carbon dioxide within the mitochondria – the cell is healthy. It is the breakdown of efficient metabolism within cells and tissues that heralds cancer and other diseases within the body.

Nearly every disease state known to man has been linked to low mitochondrial activity. Understanding which foods and factors enhance metabolism, and which inhibit it are paramount for designing an effective treatment strategy.

Lowering Metabolism with Environmental Toxins

One important thing to understand about cellular metabolism is that every step of the process is catalyzed by a specific *enzyme*.

One such enzyme is called cytochrome c oxidase, which was discovered in 1926 by Dr. Otto Warburg, who went on to receive a Nobel Prize for his discovery.[2] This enzyme is critical for oxygen use by cells because it interacts directly with oxygen[3] and catalyzes the very last step in the process of metabolism (oxidative phosphorylation).[4-5]

Dr. Warburg found that simply by inhibiting cytochrome c oxidase, a healthy cell could be turned into a cancer cell – a finding which has been validated by a number of recent experiments. "Defects in cytochrome c oxidase expression induce a metabolic shift to glycolysis and carcinogenesis," wrote scientists from the University of Pennsylvania in 2015.[6]

A number of chemical toxins have been shown to inhibit cytochrome c oxidase activity, including chemotherapy,[7] cyanide,[8-10] carbon monoxide,[11-12] aluminum phosphide,[13] estrogen,[14] serotonin,[15] endotoxin,[16-17] aflatoxin B1,[18] UVB radiation,[19] X-ray radiation,[20-21] and unsaturated fatty acids.[22]

Here's how it works: Upon exposure to any of the environmental contaminants listed above, cells produce a free radical called nitric oxide, which binds directly to cytochrome c oxidase, deactivating it.[23-25] For as long as nitric oxide is bound to this enzyme, the cell will have a defective 'cancer' metabolism.

Enhancing Metabolism with Red Light

The interactions between red and near-infrared wavelengths of light and cellular metabolism are fascinating and unique.

Red and near-infrared light are two factors which have been proven to actually unbind (aka photodissociate) nitric oxide from the cytochrome c oxidase

enzyme,[26-27] restoring its activity. But the truth is even more incredible.

Cytochrome c oxidase is unique in that it actually absorbs light specifically within the red and near-infrared portions of the spectrum. So not only does red and near-infrared light liberate the cytochrome c oxidase enzyme from inhibition by nitric oxide, it also directly energizes this enzyme, which supercharges its activity[28-46]

The result is enhanced cellular metabolism[47-50] and the cascade of beneficial physiological effects that emerge from increased metabolic activity, including:

- Increased energy (ATP) production[49-50]
- Increased cellular oxygenation[52-54]
- Increased blood flow in the body[55-56]
- Increased CO2 production[51]
- Reduced stress hormones[57]
- Reduced lactic acid[49-51]
- Reduced inflammation[58]
- Reduced free radicals[59-64]

It’s this cascade of benefiical physiological changes caused by red and near-infrared light that can account for most, if not all, of the broad ranging beneficial effects of near-infrared and red light therapies.

Summary: Red and near-infrared light penetrate deeply into body tissues, where they impart their healing effects by enhancing mitochondrial energy production.

8. Is It Safe?

Unlike most drug and surgical treatments offered by mainstream medicine today, which routinely come with long lists of potentially fatal adverse side effects, red and near-infrared light therapies have virtually no adverse side effects. In fact, they appear to be among the safest (and most effective) treatments ever discovered.

"In terms of side effects, there are very few side effects," said scientist and Harvard professor Dr. Michael Hamblin. "I've occasionally heard of people who put light on their head - I think one person had a headache and a few people felt excessively sleepy."[1]

After reading literally hundreds of study abstracts on red and near-infrared light therapies in researching for this book, I've yet to see a single adverse reaction reported in the scientific literature.

One of the reasons for this is that the energy intensity of the red and near-infrared wavelengths is extremely low. The amount of energy exposure during red light therapy treatments is so low that tissue temperatures don't increase more than a few tenths of a degree and thus pose no risk of thermal injury.[2]

Red or near-infrared light therapy devices emitting as little as 12 watts of light from red and near-infrared LEDs can have remarkably potent effects.

Red light therapy's nearly non-thermal effects make it particularly attractive for use on fresh injuries when heat would likely worsen swelling and inflammation.

Lastly, for what it's worth, red light therapy is an FDA approved treatment for a number of indications and is considered safe by the US Government.

9. My Experience With Light Therapy

I first learned about red and near-infrared light therapies in 2014 while searching online for effective alternative treatments that I could use on myself to improve my health and life. At that point I had tried dozens of other supplements and foods with various successes and red light sounded promising so I decided to put it to the test.

I purchased a red and near-infrared light device and the effects were potent and almost immediate. After my first 12 minutes of treatment shining the light on my stomach and chest area, I felt noticeably more relaxed - as if a weight had been lifted off my chest.

Next, I held the light up against my forehead to see how red light would impact my brain function. I didn't notice anything until I left home and began interacting with people. The effects were profound. My brain cells felt energized and the quality and speed of my thoughts and speech were markedly enhanced.

Today I use red light almost every day on my brain, particularly before work in order to ensure my cognition is at peak function. I shine near-infrared and red light therapy on my thyroid, which enhances metabolism and energy levels throughout the day. I also use light therapy on my testicles, after noticing significant enhancement of my sexual function.

I've also tested red light therapy at a local tanning salon, which used a tanning bed equipped with red fluorescent tube lights.

The effects of red light therapy in a tanning bed didn't feel as pronounced as using my light therapy device at home. Another downside of receiving red light therapy at a salon or dermatologist clinic is the price. Sometimes these places charge as much as $50-$100 for a single session.

It is far cheaper and more convenient to buy your own device and reap the benefits of light therapy at home, which is why I offer them to fans on my website. I want to help people obtain healing through what I believe to be one of the most powerful forms of therapy ever discovered.

The high-quality red and near-infrared light therapy devices available on

EndAllDisease.com are manufactured with LEDs rated to last 50,000+ hours, which means purchasing a single device will likely last you the rest of your life.

Note: If you haven't already, be sure to sign up to receive your free dose guide, audiobook and off coupon.

10. Questions & Answers

This section contains a number of questions people have asked me about red and near-infrared light therapies.

In the interest of making this book the most complete resource ever written on red light therapy, if you have any questions after reading it, please email them to me at mark@endalldisease.com and I will add them to this section in the updated edition.

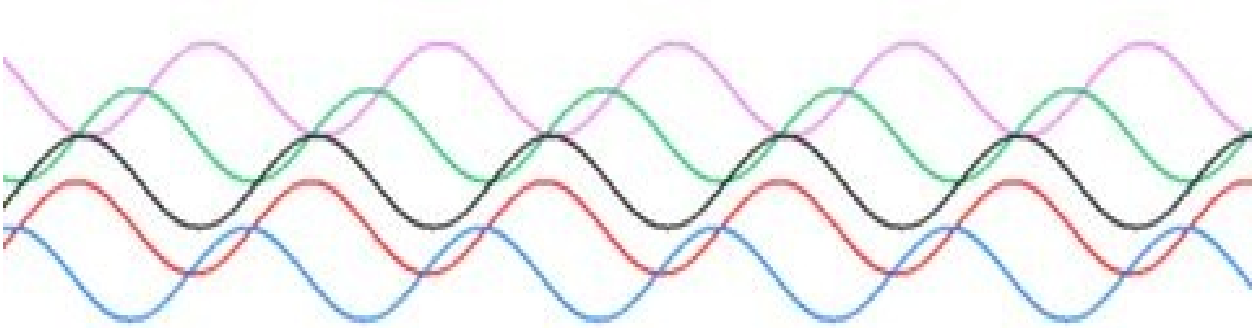
Do I need to wear eye protection during red light therapy?

To date, no eye damage has ever been reported from red or near-infrared light therapies. And to the contrary, red light has been found to actually improve visual acuity in some cases. So like all cells of the human body, eyes kept open and uncovered will likely obtain benefit from the light.

The only case in which you might want to use eye protection is if you feel discomfort from the brightness of the lights during treatment.

What is a wavelength?

When electromagnetic radiation, like radio waves, light waves or far infrared waves travel through space they are said to make their own repeating sine wave patterns. The wavelength is simply the distance over which the wave's shape repeats. For example, red light has a shorter wavelength than near infrared, and far infrared has an even larger wavelength.



Can incandescent, halogen or fluorescent bulbs be used for red light therapy?

Incandescent and halogen light bulbs emit as much as 35% of their total power output within the therapeutic range for light therapy.

In addition to using my red light therapy LED device daily, I've incorporated infrared heat lamps in my home as a way to enrich my environment and make it more conducive to health. Proper lighting is essential for the maintenance of human health. My cat, who falls asleep under them regularly, would agree.

Fluorescent bulbs are a different story. They emit some ultraviolet light but almost no red or near-infrared radiation, which is likely why many people experience unwanted side effects from exposure to these lights. Dr. Ray Peat has said the use of fluorescent lights in offices and workplaces is likely a large contributor to the disease epidemic currently taking place.

What's the difference between far infrared and near infrared therapies?

Infrared saunas have seen an increase in popularity in recent years. The wavelength of radiation administered by infrared saunas is usually far greater than the therapeutic range of near-infrared and imparts its therapeutic effects mainly through heat as opposed to interactions with respiratory enzymes like red and near-infrared light.

Far infrared saunas range in bandwidth from about 3000nm to 1mm.

While the most relevant wavelengths of red and near-infrared radiation for healing are between 600nm to about 1000nm, even the shortest wavelength of far infrared sauna's today don't generally fall below 1400nm.

Why do I feel tingling during light therapy treatment?

According to Dr. Michael Hamblin, the ‘tingling’ feeling some people feel on their skin during red light therapy administration is the literal photodissociation of nitric oxide from the cytochrome c oxidase enzyme taking place inside cells.

About The Author

MARK SLOAN has been researching and writing about many subjects, with specific emphasis on health, for over 15 years. He has written over 300 articles, and is the author of a number of books including *The Cancer Industry* and the 6x #1 international bestselling book *Red Light Therapy: Miracle Medicine*. Mark lives in Ontario, Canada and his goal is to build his own home, produce his own food and raise a family as free and independently as possible. Mark is passionate about learning and his ultimate goal in life is to reduce the suffering in this world and to make a better place for every human being alive and for future generations to come.

Visit Mark's Website at EndAllDisease.com

Other Books By Mark Sloan

- Cancer Cured: Victory Over The War On Cancer
- The Cancer Industry: Crimes, Conspiracy and the Death of My Mother

One Last Thing...

If you enjoyed this book and found it useful I'd be very grateful if you leave a short review on Amazon. Your support really does make a difference and I read all the reviews personally so I can get your feedback and make this book even better.

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9. My Experience With Light Therapy

No references.

10. Questions & Answers

No references.

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