1033: Red Light Therapy: Hoax or Helpful? And How to Get it Free (solo episode)

Child: Welcome to my mommy's podcast!

This episode is sponsored by BON CHARGE, and I love so many of their products from their red light face mask to their sauna blankets and everything in between. They focus on high-end wellness tech, and if you're interested in how light can help you, which I talk a lot about, BON CHARGE has so much to offer.

Studies have found that specific red light frequencies can help reduce fine lines and wrinkles when used at the correct brightness and strengths. And some products don't get these correct. The frequencies of red and near infrared light stimulate cellular activity at a mitochondrial level, which I talk a lot about on this podcast.

This can create better energy efficiency in a given location of the body. For instance, red light on your face gives more cellular energy for biological processes. This can help to decelerate the signs of aging and lead to firmer, plumper skin. So the long-term results you can see when using an LED mask over time are things like, reduction in the appearance of fine lines, reduction in the appearance of wrinkles, reduction in under eye bags, firmer skin, tighter skin, reduction in signs of aging, scar fading, plumper looking skin, reduction in visibility of blemishes, and visibly clearer looking skin.

I'm always a fan of getting natural light from outdoors, but for people who are wanting to kind of tackle the aging process head on, this is in a way to kind of give your body some extra benefit from these specific wavelengths of light.

The safe, non-invasive beauty treatment is going to be around for a while, and for a good reason given the results people are seeing. If you wanna check out the BON CHARGE Red Light Face mask, and all of their products, you can go to https://boncharge.com/wellnessmama and use the code wellnessmama for 20% off.

Katie: Hello and welcome to the Wellness Mama Podcast. I am Katie from wellnessmama.com, and this will be a short solo episode, hopefully short, that goes deep on the topic of red light therapy. Because this is something I have written about for over a decade now, and wanted to give some updated information about as my opinion around these things.

As well as ways to get it entirely for free and in a better format than you could ever get from the most expensive devices. So in this episode I'm gonna talk about what red light therapy or photobiomodulation actually is. How near and infrared light affect cells, the mechanisms in plain English, wavelengths and depths that matter, how to find these in nature, the best protocols, safeties and cautions, home tips, how to use it for supporting different things in the body and my routine.

Before I jump in, of course, a reminder, nothing I ever say on this podcast is medical advice or actually any advice for that matter. I am only sharing my personal opinion from my own experimentation and research.

You are your own primary healthcare provider. Do your own research, ask questions, question everything, including and especially me. And I'm just sharing my personal research and experience as a starting point for inspiration for yours, never for comparison, advice or prescription. So with that said, here is my understanding and opinion of Red light therapy as it exists.

So red light therapy or photobiomodulation is using certain spectrums of, and the wavelengths of red light to modulate cellular function. And the cellular function part is important. We'll go deeper on that later. Typically, we're talking about wavelengths in the 620 to 700 nanometer range, as well as the between 700 and 1100 nanometer range.

And those do different things. Now, the real question when it comes to red light therapy is, is it a hoax or is it helpful? So in this episode I'm gonna dive deep into some of the nuance that will help answer that question, cover the mechanisms, the evidence, free strategies of how to get this outside, which is my preference, best practices, and cautions.

Now without getting too sciencey, I wanna just cover some of the core mechanisms as I understand them in plain English, because certainly there is a lot of deep science around this. The explanation can get pretty sciencey. I'm gonna try to break it down without getting too deep into the science. So when we're getting red light exposure, like I said, it has a cellular effect and this is important to understand.

This works through our primary chromophore, which might be a new term for a lot of us. Basically cytochrome c oxidase absorbs red and near infrared light, and this light can displace nitric oxide from the enzyme which can improve electron transport, membrane potential, and ATP output. So this is one of the reasons you hear that red light might be helpful for mitochondria and for ATP production.

There's also secondary signaling, which includes transporting reactive oxygen species and Ca2 that can trigger repair pathways. That's not as talked about, but we'll come back to that one later. There's also, we're gonna dive into wavelength ranges and tissue depth. Red tends to favor skin and superficial tissues, such as pure red light, whereas near infrared can penetrate deeper and is often used more for muscles, joints, et cetera.

With wavelength specific studied effects, especially like 810 nanometers, 980 nanometers, et cetera. So if you wanna understand the mechanism and what's actually happening, because I know with light it can be hard to tell if it's having effect, and then sometimes we

can doubt that it's beneficial just because we might not feel an immediate difference like we might from eating something that does or does not agree with us.

So think of yourselves, especially mitochondria as tiny power plants. And I'll do another episode on voltage and my understanding of it soon. I do believe mitochondria are much, much more than just power plants, but this is one of their roles. Mitochondria, we can think of them as solar power plants.

And inside these little power plants, there is an enzyme called cytochrome c oxidase, often shortened to CcO. And CcO is a key step in the electron transport chain that ultimately leads to ATP production, which is our cell's usable energy. So supporting the mitochondria and ATP production typically is very beneficial for the body.

There's some nuance there as well. And the best I've seen an explanation of this is Justine Stenger and her course, which I can link to in the show notes if you really wanna go deep on that if you're having any health issues that could be related to things like cell danger response one, two, or three, which actually most are, and she breaks that down really well.

But without getting too deep in the science, cytochrome c oxidase can get gummed up by nitric oxide. Nitric oxide is useful and important elsewhere. For instance, vasodilation and the widening of blood vessels. But when it sits on cytochrome c oxidase, it can actually slow energy production. So it's like putting a parking boot on a wheel.

So we want nitric oxide, but we want it to be in the right place at the right time. Red and near infrared photons are the kind of right shape to kind of fill that in, to be absorbed by cytochrome oxidase. So when CcO absorbs this light, it can knock the nitric oxide off the enzyme, which is called photo disassociation.

And with nitric oxide out of the way, electrons can flow more smoothly. So this is why you might have heard that red light can help improve nitric oxide function. That's what's actually happening. And the mitochondrial membrane potential, which is your cell's battery charge rises and ATP output increases.

The small boost in energy kicks off a secondary we’re okay signal to the body, a safety signal, which I've also talked a lot about. And two specific mechanisms here that are interesting. There's a brief tiny increase in reactive oxygen species, which get a bad wrap. But in this context, reactive oxygen species act like a wake up call.

This is not necessarily a signal of damage. The signal is to turn on antioxidant and repair programs. So think NRF2 gene expression for cleanup of enzymes. Similar thing happening here. They also nudge calcium signaling and small changes in calcium inside the cell are

like a text message to the nucleus of the cell to start building and repairing proteins and to coordinate anti-inflammatory responses.

So these things both happen briefly, but importantly within the cell. So put simply light exposure in the right wavelengths frees up the enzyme that makes energy, your cellular battery charges better and the cell gets a coordinated response of repair and calm inflammation messages. So a lot of that happens very quickly.

And I will say within a broader context, I talked a lot about light recently, I actually plan to talk a lot about it more in the future, I personally put this as a higher factor even than diet when it comes to health. I think our light exposure and our light environment actually is one of the most critical signaling mechanisms for our body and that this one is often overlooked and that many of us could get much better results by taking our light environment into account. So more podcasts on that coming soon. I know you've probably heard me mention before my kind of core practices around that, including morning sunlight, bright midday sun exposure within the healthy range, and watching the sunset as well as avoiding, as much as possible, artificial light after dark and not eating after dark.

Again, more on that to come. I wanna go a little deeper on the wavelengths and how deep they go, because I also see a lot of misunderstanding around this, and not all red light and near infra red light is the same. If you're using devices, a lot of them will tell you what wavelengths they're using.

If not, that could be a red flag. You would not wanna just use a generalized red light or a red bulb because you actually don't know for sure what wavelengths you're getting or if they're beneficial. But different wavelengths interact with tissue differently. Because of how skin, blood, melanin, and water absorb and scatter light.

So there's kind of categories to understand when it comes to this. So one is just red light itself, which is 620 to 670 nanometers, typically. This is absorbed more by the blood and the pigments near the surface or skin level. So this is great for skin level targets, like fine lines, superficial wounds, scars, hair follicles.

And this is the one most commonly talked about and used in a skin healing and anti-aging context. The typical penetration of these wavelengths is a few millimeters or sometimes up to a centimeter, depending on the area of the body. Next, there is near infrared, which is about 7-900 nanometers.

This enters the optical window of tissue where absorption is lower, so it penetrates deeper. So this is more targeted for tendons, joints, muscles, peripheral nerves, et cetera. So this is more often used for recovery in deeper areas within the body. And it typically can penetrate several centimeters, especially around joints that don't have as much overlying fat.

So this one is typically more used by athletes or for recovery, and here's why, here's some more specialized ones and why specific wavelengths matter. 810 nanometers or kind of in the, between the 808 to 830 nanometer range sits in the sweet spot. That's where you're gonna get the interaction with calcium c oxidase, relatively low absorption by water and good penetration.

So this one's widely used for joint muscle and nerve applications and recovery. 850 nanometers is common in LEDs and behaves similarly, though it isn't quite necessarily in the perfect range. And then 980 nanometers is absorbed much more by water. So this can create more heat, which can be good for increasing local blood flow, but tends to provide less of the classic photobiomodulation red light effect and less signaling of cytochrome c oxidase.

It's not bad, it's just different. So more thermal, less photochemical. And you'll see kind of usually a mixture of some or all of those in red light devices. And I will, in the show notes, link to a few red light devices that I have and that I've used. I will say devices are not my favorite way to get red light.

I will talk more about how I prefer to get red light in a little while after we talk about what some of the evidence and the mechanisms say around red light therapy. But I'll come back to that. But practical takeaways from understanding the wavelengths. If your aim is red light, 630 to 660 nanometers at skin, that's gonna be skin and surface tissues near infrared, 810 to 850 for deeper tissues like muscle, tendons, ligaments. The dose matters. So these effects were hormetic, meaning a little is helpful, too much is not better. So you, you don't wanna go past the optimal dose. That can backfire with a caveat I'll explain later. So, shorter sessions at appropriate distances usually outperform a more is better approach.

Now there actually is pretty solid evidence on the benefits of red light therapy and photobiomodulation specific to musco musculoskeletal pain and recovery. There's some systematic reviews and randomized control tiles that show that photobiomodulation can reduce pain and sometimes speed recovery, especially for athletes.

And the effect sizes vary based on the dose and the protocol. There are studies on whole body photobiomodulation that suggest improvements in pain and quality of life, and there are higher quality trials in progress right now. One that's especially interesting is dentistry and oral applications and mucosal healing.

So there are actually good professional guidance documents online about the parameters and the anti-inflammatory benefits for oral health. And I'm seeing an emergence of red light

toothbrushes and mouth devices. I'll actually link to a couple of the ones I've tried in the show notes, but I love to see this getting studied and used more.

The bottom line, I do think that this is evidence backed and promising. It seems also to be condition specific. It's not a panacea. The dose matters. The source matters. And more on that in a little while. But now I wanna talk about my favorite way to get red light therapy because I feel like it's often overlooked and I've heard people say they wish they could get red light therapy, but the devices are too expensive, and I can certainly empathize with that.

I know a lot of the devices, especially the really good ones, can be incredibly pricey. The good news is, in my opinion, you don't need them because there is a free source of red and near infra red light that is available to most of us, most of the year, and I will include links, but if you wanna hear more about this, you can follow two sources I love are Dr. Courtney Hunt and Justine Cellular Nutrition. She's an amazing course, but both of them talk about the natural red light that is available from the sun pretty much all day, but especially in concentrated amounts at certain times a day. And this is my preferred way to get red light. I did not know this years ago and now almost entirely get my red light exposure from the sun whenever possible.

The good news is it typically is possible in a lot of places, even in the winter, even when we can't get UV, we can still get red light. Sunrise and sunset are special for this as well. And these are kind of magical times for red light, and yet another reason that if possible, I highly recommend prioritizing watching the sunrise.

I think this is one of the simplest free steps we can do for our health. If it's not possible, at least going outside and getting natural light exposure first thing in the morning before we're staring at screens or interacting with artificial light. But the reason sunrise and sunset are special for red light, there's longer atmospheric path link, path length, so higher air mass basically, which filters short wavelengths and lowers the UV. So the spectrum shifts high into the red and near infrared heavy spectrums relative to midday. So the practical takeaway here is there is more red and near infrared proportion with minimal UV early morning and late in the day.

I personally think this is very much a both and. I also prefer to get a lot of midday sun. I do think that morning and evening sun prime our cells and our mitochondria for best use of light throughout the day as well. So I love making this a part of my routine and stacking this habit. I think morning light is really helpful for so many things.

I've talked about this a lot. You guys might be even tired of hearing we talk about this at this point. But morning light anchors circadian timing, it starts the clock for melatonin production and our sleep clock later on. And if we pair this with barefoot grounding or a

walk, we get so many benefits. I also like to hydrate with water and some kind of minerals in the sun, first thing in the morning, barefoot on the ground, before coffee, before breakfast, before screens, before kind of anything else like that is a great light singling point and starting point of my day.

There's a caveat here as well around glass, around glasses, around contacts, sunglasses, anything that is between our bare eyeballs and this natural light, which is windows filter parts of the spectrum. So we're not getting the full benefit if we're doing this from indoors looking through a window, if we are wearing glasses or if we are wearing contacts.

So if any of those things apply, my personal preference is to go outside without glasses or contacts, not through a window, and get that natural light exposure for at least 10 to 15 minutes if possible. Justine recommends actually an hour or more. I do think when it comes to these spectrums, they're extremely beneficial.

So you're not gonna overdose on natural light, especially around sunrise and sunset. So kind of the more, the better. I know some people, including Justine, spend a whole lot of time outside. They'll eat breakfast outside, do work outside. If you're using a computer, being outside kind of neutralizes some of the harmful effects of the artificial light, so the more the better when it comes to that with, of course, the caveat of not burning during midday. If you're not gonna get this purely from outside here are some best practices from my understanding with devices and some caveats.

The key parameters to know if you're using a device are the wavelength, the irradiance which is a measurement of how much of that, the intensity of it, essentially, the fluence energy dose, the distance and the time. Avoid thinking in watts only because the dose at the tissue, what's actually affecting the body, is what matters, not just how much the machine is capable of creating. And like I said, I will link to some of the ones that I've used and like in the show notes. But if you are wanting to use this for skin for anti-aging you people often use 620 to 670 nanometer in lower doses.

I will say anecdotally, when I was reversing my thyroid issues, I used multiple types of red light and got natural light from outside. So I use the red light and near infrared light in different varying doses for deeper tissues, joints, muscles. And I use this on my thyroid as well, more in the range of 810 to 850 in moderate doses.

And most of the studies look at frequency of three to seven days a week cycling to avoid overtreatment. So I use different ones on different days other than sunshine I use every day when possible. Start low titrate by response. So pay attention to if your skin gets warm, to if your symptoms change, listen to your own body on this.

And remember more is not necessarily better. There's a hormetic dose here. So the good news is often, a few minutes a day can be very effective. From a positioning standpoint, most of the evidence points to perpendicular to the target area and a distance that delivers the intended irradiance. You wanna track your session times to hit the right dose windows.

For most devices, this will end up being in the five to 15 minute range. This is not a long protocol, and you wanna also, if you're in my opinion, doing this and making time for it, combine it with other basics like protein, getting enough minerals, sleep, and movement, because photobiomodulation is an adjunct.

It's not a substitute. You can't out red light a lack of important nutrients or sleep.

Also, briefly, I'm gonna touch on a few safety and cautions. Again, nothing I ever say is medical advice. If you have a specific health condition, obviously check with your practitioner, who knows your specific case, if you for any reason have concerns about red light, don't do it or do your own research.

But here are some of the ones that show up in literature. People ask and are concerned about their eyes and exposure. So red and near red have actually been studied for ocular uses under very specific circumstances. I personally would be like, at least do the research and be careful about consumer devices near the eyes and avoid closely staring into high or radiance lights.

Some companies recommend eye protection similar to what you would wear in a tanning bed when using red lights. Other people have talked about using red light to actually improve their vision and eyesight and eye health. But things like photosynthesizing medicines and conditions can impact this and deserve clinician input.

What I personally do and don't, I'm not recommending by any means, but I often will have my eyes open in red lights. Certainly if I'm outside in the morning, my eyes are open and I'm getting that exposure to my eyes, which affects our melanopsin receptors, and I think is very important. With devices, I tend not to stare directly in them, but I also don't wear eye covering or anything to keep them from getting in my eyes.

I'm just not staring closely in them. If I'm turned to the side, I'll have my eyes open though. You also wanna be aware of heat and load. So higher power near infrared, like 980 nanometers, can induce thermal effects. Some of these are used in different types of infrared saunas. So you wanna watch your skin temperature, especially if that's not your desired mechanism, what you're trying to accomplish.

Or if you have any heat sensitive conditions, of course, check with the doctor. And in general, some cautions show up in the literature around pregnancy, cancer care, if you've

had recent steroid injections or anything that would be contraindicated or implanted electronics. Personally, I have used red light while pregnant.

I talked to my midwife about that. I think in any of those situations, talk to your, whoever your partner is in your health and see if it's a good idea for you.

Like I said, my favorite way to do this is to get it free. So here is my brief, how to get it free playbook if you don't wanna have expensive devices. Sunrise strategy is to get 15 to 20 minutes outside within an hour of sunrise, and also as soon as possible after waking up with your face and eyes, no glasses or sunglasses, exposed to ambient light.

Don't have to stare directly at the sun. Add a walk for movement or be barefoot on the grass, can do some gentle lymphatic flow movements. Also this is a great time to hydrate with mineral water and this is my go-to non-negotiable and I think one of the most underrated health tools that we just simply don't do and prioritize in the modern world.

If you haven't tried it, I know it sounds so simple, it sounds almost silly in how simple it is, but I would highly encourage you to experiment and try it and see what you notice. I also love to prioritize sunset unwind, which is 10 to 20 minutes outside before dusk. To shift toward evening physiology.

This is relatively higher red and near infrared as well, and I love to then come inside and switch to no blue light, low light. Ideally anything that mimics a campfire at this time of night, simply the more red light and low light, the better, the less blue light the better. If possible I try to also avoid eating after sunset, which personally works great for me.

There's also the component here of that red and near infrared scatter and reflect off natural surfaces. So when we're outdoors, actually leaves and trees, highly reflective, and bounce near infrared and red. So by being outdoors and not behind glass, we are getting the fullness of this experience.

Also be aware that artificial light environment, especially at night, has a big impact here. So this isn't just about red light, but it's the balance of our light environment, which, like I said in the beginning, I think is one of the most underrated health tools that we're not talking about. Getting red light at night, watching the sunset, will not cancel out the downsides of staring at artificial light and screens after dark. If you haven't tried that, I would highly recommend modifying your light environment in your home, which I've also written about. Having red lights, lamps, orange and red glasses, et cetera, and seeing the difference on your sleep after a couple weeks, it can be really, really drastic.

So as we get to the end, some practical quick protocols, some general guidelines I've experimented with. Again, start with natural light. If that's all you do, that's awesome

actually. For skin health and fine lines, the ones that show up in the studies are red light spectrum, 630 to 660, 3-5 times a week.

For joint muscle recovery it's more of the near infrared spectrums and the 800's, three to seven times a week for two to four weeks, then tapering down. I've used both of these on my thyroid in the past with good results personally. And then for sleep support, pair outdoor morning light with evening low intensity red light, and then avoiding bright blue lights at night.

Now, as I said in the beginning, there's some controversy surrounding red light and I wanna address the skepticism and talk about is this hoax or is it helpful based on my opinion. In my understanding, the mechanisms are well described. The evidence is there. There's a lot of actual studies and I can link to some of those in the show notes around the benefits of red light therapy for certain pain, inflammation and tissue healing contacts, and it's still being studied for others. Outcomes hinge on correct wavelength, dose, and consistency. And these can, I think, be helpful when used intelligently and disappointing, if not used correctly. And they certainly are not a cure all. In my personal opinion, the best place to get these is outdoors. And even if we are supplementing with red light devices, still starting with outdoors is important.

So very briefly what I do, I try to get daily sunrise, sunset, outdoor exposure, barefoot when possible, moving when possible. I use devices for targeted sessions beyond but not as a replacement for nature. So for delayed onset muscle soreness for skin things, for joint recovery, a few times a week, or as needed my tip would be to start with the free light at the bookends of the day, sunrise and sunset.

If adding a device, learn its radiance and dose. And track your outcomes for four to eight weeks and see if it's actually making a difference for you. But don't skimp on the natural light exposure. Even if you are using a device, I don't think a device could ever replace the multifaceted benefits of natural light exposure outside.

So that is my understanding of red light therapy or photobiomodulation, and I would love to hear from you what your experience has been, if you've ever used protocols, what you noticed. Like I said, this was something I did use in my Hashimoto's recovery and now, especially from natural sources, is something that's part of my daily routine.

I would love to hear how you integrate red light if you do. I also would always love to hear from you, questions you have, topics you would like me to talk about or guests you would like me to interview. So feel free to always message or leave a comment related to that. And if you have two minutes, I would be infinitely grateful if you would leave an honest rating or review wherever you listen to podcast, which helps other people to find and listen to this

podcast as well. For today, thank you so much for sharing your time, your energy, and your attention with me. I'm so grateful that you did, and I hope that you will join me again on the next episode of the Wellness Mama Podcast.