



**Transcript: #437 How to Eat for Energy and Optimize Mitochondria with Ari Whitten**

**Dr. Wendy Myers:** Hello, everyone. I'm Dr. Wendy Myers. Welcome to The Myers Detox Podcast. And you can find all the information about how to detox your body on [myersdetox.com](http://myersdetox.com), my website, and you can sign up to get all kinds of free e-guides. You can take my heavy metals quiz at [heavymetalsquiz.com](http://heavymetalsquiz.com) to sign up for my newsletter. So, I highly recommend that you get the latest updates on health and how to detox your body. And that's what we talk about on the show. Today, we're talking with my friend, Ari Whitten, about how to eat for energy. Really interesting show today.

**Dr. Wendy Myers:** We talk about how to optimize your mitochondria. We talk about how people lose, on average, 10% of their mitochondria per year. We talk about some of the super foods and foods that you need to feed your mitochondria. We talk about all kinds of ways to optimize your circadian rhythms, these cues that your body takes from the environment to regulate sleep and energy production. We talk about just so many interesting things. Ari's always such a wealth of information on how the body works. He's the author of several books. I think he has eight books by now, and his newest book, [Eat For Energy](#), has reached 68 in all the books on Amazon. We're going to go into detail about what that book covers. So, check out the show. It's really, really good.

**Dr. Wendy Myers:** And, I know you guys listening to the show are concerned about your body's burden of heavy metals and toxins and how to detox them. So, I created a quiz called [heavymetalsquiz.com](http://heavymetalsquiz.com). You can go there and take a free quiz. Get your results on your body burden and your levels of body burden relatively. And then you get a free email series that includes lots of free videos that answer all of your frequently asked questions about detoxification, how to detox your body, how long does it take, what are some of the optimal supplements to detox your body, heavy metals testing, and so many different things. It's really, really educational. So, go check that out at [heavymetalsquiz.com](http://heavymetalsquiz.com).

**Dr. Wendy Myers:** So, on the show today, Ari Whitten is the founder of The Energy Blueprint System, a comprehensive lifestyle and supplement program that has helped more than 2 million people and counting experience optimal health, performance, and more energy; everybody wants. And so he's also the best-selling author of The Ultimate Guide to Red Light Therapy, and he's also the host of the popular The Energy Blueprint Podcast, which features the world's leading natural health experts. And I've been on that show as well.

**Dr. Wendy Myers:** And so, in 2020, Ari was voted the number one health influencer by Mindshare, which is the largest natural and functional medicine community. And for more than 25 years, Ari has been dedicated to the study of human health science. He holds masters in human nutrition and functional medicine, a BS in kinesiology and certifications as a corrective exercise specialist and performance enhancement specialist from the National Academy of Sports Medicine. And he has completed all the coursework for a clinical psychology PhD. You can find his podcast, programs and supplement formulas at [theenergyblueprint.com](http://theenergyblueprint.com).

**Dr. Wendy Myers:** Ari, thank you so much for coming on the show.

**Ari Whitten:** Thanks so much for having me, Wendy. Always a pleasure to connect with you.

**Dr. Wendy Myers:** Yeah. So, you're talking a lot more these days about something I've spoken quite a bit about, which is fatigue, and it's the number one complaint that most people have when they're addressing their health issues, that everybody wants more energy. So, why don't you talk to us about some of the top causes of fatigue?

**Ari Whitten:** Okay. So, I think this is such a big-picture question that sometimes it's hard for me to know where to begin because it could be a 10-hour answer, right? So, the high-level sort of 30,000-foot view is, I like to think of fatigue as having two fundamental causes. One cause is what's going on at the lifestyle and environmental level? So, what environmental toxicants are you being exposed to? Which is your area of focus, which is a huge factor for many people. Psychological stress. What about your nutrition? What about your circadian rhythm and sleep? What about your light deficiencies, light toxicities, right? There are so many different aspects of what's going on at the environment and lifestyle level. That total body stress load that you're under is a huge factor in controlling your energy levels. And we'll talk about what mechanisms are actually mediating that.

**Ari Whitten:** And then the other big factor is you, meaning what is going on in your body at the cellular level, not just in the sense of your lifestyle and environment. We'll treat that as a separate issue I just mentioned, but in the sense of, are your cells filled with big, strong mitochondria and lots of them? Or are they filled with weak, fragile, atrophied mitochondria, and very few of them? And, to give you some specific data on what I mean by that, it's been shown in several studies where they take muscle biopsies, they take a big hollow needle, they jab it into

people's thighs, and they pull out a chunk of muscle tissue. They literally put it under a microscope and counted the number of mitochondria in the cells. And it's been shown that, on average, people's mitochondrial capacity, basically the number of mitochondria per cell, declines by about 10% with each decade of life on average.

**Ari Whitten:** So, a typical 70-year-old has about 25 to 35% of the mitochondrial capacity of a young adult. They've lost 70+% of their mitochondria, in other words. Now, if you're losing 70+% of your cellular energy generators, that is a huge problem. You're losing 70% of your capacity to generate energy. And these two things interface, factor number one that I mentioned, what's going on at the environment and lifestyle level, and factor number two, which is your cells and how many mitochondria do you have? Those two things interface with one another. Mitochondria are actually tasked with responding to the stress that the body is under. And, they are essentially the most upstream thing.

**Ari Whitten:** The way mitochondria used to be taught in high school, and actually is still taught in high school and college biology courses is as these mindless energy generators that just take in carbs and fats and pump out energy in the form of ATP. It turns out, in the last decade, we've discovered that mitochondria actually have a second role, and that is a role as environmental sensors. And they are essentially the canaries in the coal mine of your body, and their job is to sense when the body is under threat. So, they're constantly taking samples of the environment, basically asking the question, "Are we under attack? Are we under attack? Is there a threat present?"

**Ari Whitten:** And, here's the key thing, their role in orchestrating a defense response to that stressor, to that threat, to the degree that they are doing that, they are turning down energy production. So, in other words, energy and cell defense are two sides of the same coin, and they are mutually exclusive functions. So, to the degree that the mitochondria are picking up on a threat, whether that threat is heavy metals like you talk a lot about, or other environmental toxicants or psychological stress or poor nutrition or sleep deprivation, or any number of other stressors, a pathogen, lots of other things, they are turning down the dial on energy production. And that is fundamentally what controls and regulates human energy levels.

**Ari Whitten:** And, the last thing I'll say on that is, to the degree that you have big, strong mitochondria and lots of them in your cells, your mitochondria have a higher resilience threshold, meaning they have a higher capacity to handle the stress load that the body is under and maintain health and homeostasis and high energy levels. And to the degree that you've lost mitochondria, and you have weak, fragile, atrophied mitochondria and few of them in your cells, you lower your resilience threshold. Then, the mitochondria become much more easily overwhelmed. They are triggered into defense mode, where they turn down the dial on energy production much more easily. So, that's kind of the big picture overview of what's regulating, what's actually controlling, human energy levels.

- Dr. Wendy Myers:** Yeah. That's really, really interesting. And you talk about the cell danger response where they're shutting down energy, so they're not feeding a pathogen or giving them energy, fueling energy for them to survive and thrive. And there are so many factors that affect our energy levels. So, what about nutrition? So, the mitochondria require specific types of nutrition. So, how does your nutrition make or break your energy levels?
- Ari Whitten:** Yeah. Well, that's the topic of my new book, Eat For Energy, and it's how to beat fatigue and supercharge your mitochondria and unlock all-day energy.
- Dr. Wendy Myers:** Where are you on Amazon? I saw you were like at number 58 in all books on the Amazon.
- Ari Whitten:** Yeah, that was pretty cool. I think that's as high as I got up to was 58.
- Dr. Wendy Myers:** There's a demand. There's a huge demand for this book. It's very popular. You guys need to go out and check it out.
- Ari Whitten:** Yeah. Thank you so much. So, yeah, I think it's hovering. Last I checked, it was hovering around number 100 in all books on Amazon. It's been there for a couple of weeks now, so that's great.
- Ari Whitten:** So, the whole, I guess the best way of doing it is to give an outline of what the book entails because the whole book is about the relationship between nutrition, energy, and mitochondria. So, the first chapter of the book is basically what I just explained very succinctly, how mitochondria work to regulate human energy levels. And then, the first sort of main, or the second chapter, I guess I should say, is how nutrition interfaces with the circadian rhythms of our body, which regulate energy levels or impact on energy levels through multiple different mechanisms, neurotransmitters, hormones, mitochondria. There are a few different things we could talk about there.
- Ari Whitten:** And then the next one is how nutrition relates to body composition, how much fat and how much muscle you have on your body, which relates to energy levels and mitochondrial function. And the next chapter is all about blood sugar regulation, and this is a huge thing for most people in the modern world. To give you one data point, over 80% of the population experiences spikes into the pre-diabetic or diabetic ranges of blood sugar levels every day. And one-third of adults also experience hypoglycemia, low blood sugar, on a daily basis, where blood sugar dips two to five hours after eating. And that's another major cause of low energy levels.
- Ari Whitten:** There's another segment of people that experiences what's called an idiopathic postprandial syndrome. Idiopathic means we don't know what's causing it. Postprandial is post-meal, after-eating syndrome, so it's symptoms that happen after eating for unknown causes. But they give it a name, and it sounds like they know what they're talking about. So basically, these are symptoms of low blood

sugar, but technically the body doesn't dip into low blood sugar levels. Still a problem with blood sugar regulation. These things are major causes and contributors to energy problems, and they're mainly nutritional in nature.

**Ari Whitten:** The next chapter's all about gut health. And, of course, there's gut-brain access. There's a gut-mitochondria access. What's going on in the gut has a profound impact on your energy. And the next chapter on brain health. And then, part two of the book has a section on energy superfoods and supplements, so mitochondrial enhancing supplements and energy enhancing supplements. And that's kind of like a little encyclopedia unto itself. It's almost a book, in and of itself, just that chapter.

**Dr. Wendy Myers:** Yeah. And, what's the issue with caffeine and stimulants, because you talk about superfoods and nutrition that we need for mitochondria, and we'll get into that in a minute. So, most people want energy. They reach for caffeine and stimulants. What's the problem with that, and what can people do instead?

**Ari Whitten:** Yeah. Wouldn't it be great if that was the solution to our energy problems, to our fatigue epidemic, if all we had to do was just take some caffeine and stimulants, drink some more coffee, and we're good to go? But of course, it's not. And everybody who drinks lots of coffee or takes stimulants knows that that's not a good solution. But, there is an insidious aspect because taking those compounds, using caffeine, drinking coffee, and taking stimulants, gives you this subjective sense that they energize you. But in fact, they're not. They're actually wrecking your energy levels over time. So, let me take you kind of into the mechanisms of how this works, and then we can talk about some of the research that's tested this.

**Ari Whitten:** So, first of all, how does caffeine work? To understand how caffeine works, you have to understand just a bit about the brain's neurotransmitter systems. So, the brain is always trying to regulate an appropriate neurotransmitter balance, and we have stimulatory neurotransmitters, and we have inhibitory neurotransmitters, stimulating energizing neurotransmitters, and relaxing sleepy time neurotransmitters. And there's always a balance that the brain's trying to regulate. And that differs depending on the time of day. Is it daytime, or is it nighttime, right? Balance shifts. But, it likes the proper balance, and it is trying to regulate that balance. Okay?

**Ari Whitten:** So one of those neurotransmitters, that's an inhibitory neurotransmitter that makes you lower energy, sleepy-tired, is called adenosine. So, when this adenosine neurotransmitter hits those adenosine receptors in the brain, this triggers a cascade that lowers your energy levels and makes you tired. Caffeine works by fitting into those adenosine receptors, so the caffeine molecule literally goes into those exact adenosine receptors. But instead of triggering the cascade that adenosine triggers, it just blocks adenosine from getting into those receptors. It plugs them up, so the adenosine is just floating around but can't meet its receptor. So, by plugging up the adenosine receptors, you're preventing

this inhibitory neurotransmitter from creating a lower energy effect. And by doing that, by blocking this low energy neurotransmitter, you create a stimulating energizing effect. So, that's fundamentally how caffeine works.

**Ari Whitten:** And all of that sounds wonderful. And in fact, it is wonderful, in the short term, if you take people who are caffeine naive, meaning they don't normally consume caffeine. You give them caffeine, you can measure, and many studies have measured significant measurable improvements in mood, energy levels, cognitive performance, reaction time, physical performance, stamina and endurance, and time to exhaustion. All these measures of mental and physical performance and energy are improved by giving caffeine.

**Ari Whitten:** The problem is, as I said before, the brain likes balance. It likes to be in a certain balance of these stimulatory and inhibitory neurotransmitters. So, as soon as you start to add that caffeine on a regular basis, on a daily basis, particularly if you're doing it multiple times per day, the brain starts to go, "I'm being overstimulated. I need to remedy this situation." And it adapts. It adapts to that excessive stimulation by bringing things back into balance. And the way that it does that is by creating more adenosine and more adenosine receptors in the brain. That does a couple of things. One, it increases your tolerance to caffeine. You now need more caffeine to have the same energizing effect that it used to get with a smaller amount. This is why people end up, over time, consuming more cups of coffee than they did originally.

**Ari Whitten:** And the second more important aspect of that is, you now have more adenosine and more adenosine receptors in your brain all the time, which means, as soon as that caffeine leaves your system, you have increased the amount of adenosine signaling, the amount of that reaction that adenosine is creating that is lowering your energy levels. So, this is called withdrawal. And, we use this word withdrawal in the context of drug addiction, in the context of, like, somebody is an alcoholic or a cocaine addict or something like that. And then they may have been on it for months or years. And then when they get off of it, they have withdrawal symptoms. They feel awful. Believe it or not, withdrawal symptoms with caffeine happen every single day. So, it happens within a 24-hour period.

**Ari Whitten:** So, what I mean by that is, if you look at somebody who consumes caffeine on a daily basis. Particularly if they consume multiple cups a day, if you've ever seen somebody like that wake up in the morning, typically, they're groggy. They have a hard time getting up. They have brain fog. They can't think clearly. They're kind of in this half-sleep state, zombie-like state. They don't have energy. They don't have good brain function. And then, the first thing they do is go to their coffee. And then, only 15 minutes or so after they start drinking their coffee, the systems of their body, brain, and energy levels start to turn on.

**Ari Whitten:** Now, here's the insidious part that most people don't know. Most people think, when they take their caffeine, that they're getting a boost. And so they go,

"Well, I'm in this state. And then I take my caffeine, and then I feel more energy and better brain function and all these things, so I feel like I'm getting a boost." There is a subjective boost that you feel. However, it turns out that, if you compare, and research has done this, if you compare people who are chronic caffeine consumers to people who don't consume caffeine at all, there is no boost. There is no increased level of energy. There is no increased level of cognitive performance or physical performance that you saw in the naive people who take caffeine.

**Dr. Wendy Myers:** You're just getting back to normal.

**Ari Whitten:** Exactly.

**Dr. Wendy Myers:** Getting back to baseline.

**Ari Whitten:** Exactly. So, that's exactly what's happening. So, basically, the caffeine is, because it creates those negative neurotransmitter adaptations in the brain, you lower your baseline levels of energy and mood and cognitive and physical performance. And now, the boost that you feel is actually just a boost back up to what used to be your normal level of function. It is what's called in the literature withdrawal reversal. All you're doing is you're creating these negative effects that lower your energy so that you're groggy and you have brain fog and low energy. And then you need that substance now to get you a boost back up to what used to be your normal, to reverse the withdrawal effects that you got from introducing that drug too frequently.

**Ari Whitten:** So, this is the insidious part of caffeine, and stimulants, more broadly, all do that. The same sort of basic principles apply. And basically, it's counterproductive to use caffeine and stimulants on a regular basis. It is absolutely not a solution to your energy problems. It will only make you worse to use them in significant amounts or at high frequency.

**Dr. Wendy Myers:** Yeah. I love how you're explaining this as I'm drinking green tea. So, let's talk about some of the mechanisms of sleep. So, sleep, obviously, is needed to have energy. If people are tired, they need to sleep to regenerate. But sleep's actually a very energy-intensive process. I think people don't really realize that. So, what are the mechanisms by which sleep and circadian rhythm relate to our energy levels?

**Ari Whitten:** Okay. So, there's a lot here. So, first of all, we have a circadian clock in our brains. This is the central clock. The central clock regulates many different aspects of our physiology through multiple mechanisms and neurotransmitters. It impacts dopamine, serotonin, GABA, and orexin, these neurotransmitters that are involved in mood and energy and motivation and joy and drive, and relaxation. So, having a dysfunctional circadian rhythm, or non-optimal sleep, is going to negatively affect all of those things to some degree.

**Ari Whitten:** It also impacts on many different hormones. So, we have hormones like growth hormones. For example, people with chronic fatigue syndrome and poor sleep have massively lower amounts of growth hormone at night, when we should have a spike in growth hormone. And this is a hormone that's involved in cellular healing and regeneration. We have testosterone. We have thyroid hormone. We have cortisol and we have melatonin. All of which are hormones that have many different, important physiological roles that are heavily impacted by the circadian rhythm. They're circadian-regulated hormones. So, if the circadian rhythm isn't optimal, the levels of those hormones will not be optimal. And the timing of them, the rhythms will not be optimal.

**Ari Whitten:** Now, just by itself, that already is a huge factor. But there are still more mechanisms. So, your energy and sleep are two sides of the same coin, connected by the circadian rhythm. So, the quality of your sleep at night, your energy levels, and your wakefulness during the day depend on a functional, healthy circadian rhythm. So, the central clock in the brain that I just mentioned.

**Ari Whitten:** And we also have peripheral clocks. As a more recent scientific discovery, we have peripheral clocks and basically all the tissues and organs of our body, from our skin to our muscles, to our bones, to our intestines, to our liver, to our heart, to our hormone-producing glands, they all have their own circadian rhythms. Now, while the central clock in the brain's primarily responsive to light inputs, all these peripheral clocks throughout the other tissues of our body are primarily responsive to food inputs.

**Ari Whitten:** Now, the goal, if we want to optimize the whole system, to optimize all aspects of our circadian rhythm, which impact all these different mechanisms I talked about and more, the goal is to synchronize the central clock and the peripheral clocks to have them both functioning strongly and for them to be synchronized together. So, with the central clock, we do that by modifying light inputs, getting a bright light first thing in the morning, within half an hour, getting ample bright light, ideally, outdoor sunlight throughout the day, and minimizing artificial light at night, in a couple of hours before bed. There are lots of details there, I'm sure, but it's pretty easy to access a lot of that information nowadays.

**Ari Whitten:** The peripheral clocks that are primarily responsive to food inputs require other strategies. The most important of which is your feeding and fasting windows. We need an adequate fasting window every night for our circadian rhythms to function optimally, for all of those different neurotransmitters and hormones I just mentioned, and another couple of important mechanisms. One is for lymphatic drainage in the brain, which is like the brain cleansing itself of toxins every night while we sleep. We need to be in a fasted state for that to happen well.

**Ari Whitten:** And for autophagy and mitophagy, basically, for our cells to identify and chemically digest the dysfunctional and worn out parts and rebuild new healthy parts. And that same concept, that same process, happens at the mitochondrial



level as well. It's called mitophagy and is extremely important for maintaining a pool of healthy, functional, non-dysfunctional mitochondria. Important, not only for energy but also for preventing cancer. If mitophagy and autophagy are impaired due to an unhealthy circadian rhythm in sleep, that is going to increase the risk of cancer and many other diseases massively.

**Ari Whitten:** So, all of that depends upon an adequate feeding and fasting window each day. Research by Satchin Panda has shown that over 85% of Americans consume a feeding window, from their first bite of food to their last bite of food, of between 13 to 16 hours each day. What's optimal is between six to 10 hours each day. So, most people are just consuming food way too long during the day, which is the equivalent. In terms of the central clock, it's the equivalent of having way too much artificial light blaring into your eyes, way too long during each day. And this has profound metabolic and hormonal, and mitochondrial consequences.

**Ari Whitten:** So, a couple of other things I'll mention, as far as mechanisms, is we know that disrupted circadian rhythm and sleep also impair insulin sensitivity dramatically. So, it leads to another major cause of low energy levels and mitochondrial dysfunction, which is high blood sugar levels. So, insulin resistance is very, very bad for metabolic health.

**Ari Whitten:** And one other aspect I want to focus on here is Melatonin. Many people often think of Melatonin as like, "Oh, yeah. Melatonin, that's a supplement that I use for sleep." Well, Melatonin is a hormone produced by your body. And many people still, maybe they know it's a hormone, and they know it's involved in sleep, but here's what most people don't know. Melatonin is the most important mitochondrial antioxidant there is. And, your mitochondria need to be bathed in Melatonin each night, before bed and during sleep, to be protected and recharge.

**Ari Whitten:** And basically, that melatonin not only acts as a direct antioxidant, but it also interacts with the internal antioxidant defense system inside of our cells in our mitochondria, something called the ARE, antioxidant response element, which basically contains very powerful and important internal antioxidants like glutathione, catalase, and superoxide dismutase. So, by being bathed in melatonin each night, that whole system, which is how mitochondria protect themselves from damage, that whole system recharges. And that depends on a healthy circadian rhythm and healthy amounts of melatonin bathing the mitochondria each night. So, there's a lot going on there, and we can use nutrition to optimize that.

**Dr. Wendy Myers:** Yeah. It's amazing that people, on average, get five hours of sleep per night in the United States.

**Ari Whitten:** Yeah.

**Dr. Wendy Myers:** And it's just profound implications on their brain detox and energy production, and it's something you really have to prioritize, and people just feel like they don't have time to sleep.

**Ari Whitten:** Yeah. Yeah. It's funny they're saying, "I'll sleep when I'm dead."

**Dr. Wendy Myers:** Yeah.

**Ari Whitten:** Okay. Well, you're going to die a lot sooner if you keep up that attitude.

**Dr. Wendy Myers:** It manifests a lot sooner than you think.

**Ari Whitten:** Yeah, exactly.

**Dr. Wendy Myers:** Yeah. And so, let's talk about some of the key strategies to optimize sleep because I think a lot of people don't know why they're not sleeping or why they have trouble sleeping, or they wake up in the middle of the night. And it's something that I think I had to troubleshoot so many things to get good sleep. And there are like 14 different things that can impact your sleep. So, what are some of the key ones?

**Ari Whitten:** So, light is obviously a huge one to optimize that central circadian clock. I mentioned a few things there, as far as bright light, early in the day. It's massive. It's how I start every single day. I either just go out to my land here, and I watch the sunrise. I do some movement practices and breathing practices as I'm letting that sun enter my eyes. Or I go for a walk on the beach, or I'm surfing, in which case I'm doing the same thing. I'm getting lots and lots of sunlight in my eyes. And, it's critical to start your day like that.

**Ari Whitten:** It's also critical to have a big differential between your daytime light exposure and your nighttime light exposure. So, this is something that's often overlooked by people and not well understood. But, the circadian clock in the brain basically receives light signals through the eyes. We have photons of light, primarily light that are in the blue wavelengths. Also, to some extent, the green wavelengths that enter the eyeballs hit receptors and then feed back as electrical impulses into a part of the brain called the suprachiasmatic nucleus, where the circadian clock resides.

**Ari Whitten:** Now, how it knows daytime from nighttime depends on the differential of light intensity, not just the wavelengths, the color, but the differential of the intensity of the bright light exposure between daytime and nighttime. This is why when you travel, you get jet lag. You're in a different rhythm of when the light is entering the eyes and when the darkness is happening. And so, that disrupts you for a period of time as your circadian clock needs to reset, and all those different neurotransmitters and hormones need to find a new rhythm.

**Ari Whitten:** So, that differential is critical, though. And what this means is, if you spend all day indoors, in indoor room lighting, looking at computer screens and cell phone screens and under the lighting of that room, and then at nighttime, you're still indoors under indoor room lighting, looking at screens, there's very little differential in terms of the intensity of that light exposure.

**Ari Whitten:** There's actually an interesting experiment where they took a bunch of, I think it was in Russia, they took some astronauts, and they basically put them in a chamber where they were indoors. They had no, not even windows, to the outdoor world. And they put them in a chamber, I believe, for a year. They obviously had lighting. It wasn't completely dark. And they had the lighting on during the day, and then they turned the lights off at night to sleep. And within a couple of weeks, they all had profound sleep disturbances and profound circadian rhythm disruption. Because even in that indoor environment, where you have light during the day for a certain amount of hours, then darkness, it's not enough of a differential of that light exposure. So, outdoor, bright light exposure, sunlight, and just being outdoors is orders of magnitude, a hundred, a thousand fold greater light intensity than we get in indoor environments.

**Ari Whitten:** So, we want to have lots and lots of bright light during the day, very little at night, or we want to have a much lower amount of bright light entering our eyes in the evening. And that allows the circadian rhythm to be strong, to know the difference between daytime and nighttime, and to be less sensitive, less susceptible to the melatonin suppressing effects of artificial light at night. To give you some numbers on that, we know that research has shown that being in standard room lighting in your home, just standard fluorescent LED room lighting, suppresses melatonin levels by upwards of 70%.

**Dr. Wendy Myers:** Wow.

**Ari Whitten:** So, we're not talking about just some small 5%, 10% effect if you look at your phone or your computer screen. Even just being in your home, under normal home lighting, suppresses melatonin by upwards of two-thirds of that melatonin is not in your system, not bathing your mitochondria and your brain and protecting them from damage. So, one of the consequences of suppressing your melatonin levels, this critically important mitochondrial hormone, anti-cancer hormone, anti-neurological disease neuroprotective hormone, by 70%, day after day, for months, for years, for decades, it's going to massively increase mitochondrial degeneration, neurodegeneration, your susceptibility to cancer, many other problems.

**Ari Whitten:** So, the light story is huge, and those two components, early morning bright light, lots of bright light throughout the day, minimizing bright light at night, wearing blue blockers, using software on your computers like f.lux and Iris, and things in your cell phones to minimize the blue light. And, to also control the lighting in your home, to shift to dim, incandescent or candlelight in the evenings or red light, and things like that, in your living areas at night, in your

bedroom and in your bathroom. And complete darkness at night. So, we want to create as big a differential as possible. So all of those things are critical for the central clock.

**Ari Whitten:** One of the other things that I'll mention that's not widely talked about is that a few years ago, some researchers, who were sleep researchers, went to hunter-gatherer tribes. They went to, I believe, three hunter-gatherer tribes, I think one in Africa and two in South America, and they studied their sleep cycles. For several weeks, they put sleep trackers on them, and they did a really in-depth analysis of this. There were some interesting findings of this: they debunked the myth that hunter-gatherers go to sleep when the sun goes down. They don't. They go to sleep, on average, about three hours after the sun goes down. So, they stay away typically around a firelight.

**Ari Whitten:** And, the firelight's interesting. This is a bit of a digression, but firelight actually emits lots of red light, which is something you and I have talked about in a previous podcast. And that red light and your infrared light actually help promote melatonin levels. So not only does it not suppress it, but it actually enhances melatonin.

**Ari Whitten:** The other interesting thing that they found in this study was that temperature plays a surprisingly big role in sleep and circadian rhythm, not just light exposure. So they found that, actually, the hunter-gatherers typically woke up before sunrise, not during sunrise from light exposure. They typically woke up before sunrise, and this was largely cued by the elevation in temperature. And at night, similarly, it wasn't the sun going down that cued them to fall asleep. It was the drop in temperature that occurred in the evening. So, the body is pretty sensitive to temperature, and in the modern world, we have climate-controlled environments. We can use that to our advantage by setting our thermostats to automatically cool and heat at certain times that we want to mimic those patterns.

**Ari Whitten:** And we can also do things like taking a hot shower or hot bath, 60 or 90 minutes before bed, heating up the body, and then allowing it to cool rapidly. So, for example, that could be just staying wet a little bit longer after the bath or the shower, and then going under a fan or just letting cold air from outside come in and cool you rapidly. That rapid drop in body temperature can enhance sleep profoundly.

**Ari Whitten:** The temperature that you sleep at also has a profound effect. And there is kind of an optimal temperature range between typically the mid-60s to about 70 or 72 degrees. And, it's actually surprisingly common how many people have sleep problems just from not having a good temperature in their room while they sleep.

**Dr. Wendy Myers:** I had that issue when I was going through menopause. I kept waking up at night because I was hot, and I got a chilly pad and sort of regulated my temperature. It's such a game changer. I sleep so well since I got one to cool my body down.

**Ari Whitten:** Yep. And that's acting on that same principle. You're just using that chilly pad to cool the body temperature to allow it to drop into sleep mode, which is wonderful.

**Ari Whitten:** So, those are some methods to do it. And then, there are nutritional methods to optimize the peripheral clocks.

**Dr. Wendy Myers:** Yeah. Let's get into that.

**Ari Whitten:** I'm being lengthy in my answer. I want to make sure I'm not spending too long on a topic that we don't get to other topics you want to go to.

**Dr. Wendy Myers:** Yeah, for sure. Let's talk about nutrition. What kind of nutrition can optimize our energy? Let's go into more details on that.

**Ari Whitten:** Okay. So, number one, I mentioned before, is optimizing your feeding and fasting windows. So, six to 10 hours is what we want. That's the very short version of that. And, we know that when we do that, when we switch our feeding window to between six to 10 hours, we have research showing that it improves sleep quality. It improves energy levels. It decreases levels of inflammatory cytokines, inflammation, and of oxidative stress and improves insulin sensitivity. So, we're getting these widespread improvements in metabolic health. We're going to get improvements in many different parameters of hormonal health as well, not just insulin but many other hormones. All the ones that I mentioned are tied into the circadian rhythm, testosterone and growth hormone, cortisol and thyroid hormone, and melatonin all depend on healthy circadian rhythms. So, that's one thing.

**Ari Whitten:** And another important aspect I'll mention is that we want to synchronize that window of food intake, as much as possible, to the hours of daylight. By doing that, that's how we help synchronize the peripheral clocks in all the tissues of our body to the central clock in the brain. We want to have the light inputs matching up with the food inputs as much as possible. And we know from lots of experiments in animal models and human studies that night eating, and consuming large amounts of your food in the evening, disturb metabolic health.

**Ari Whitten:** For example, I'll mention one study here that was a really interesting study. I want to make sure I get the numbers right, where they had people eat the exact same meal, either at 8:00 AM or 8:00 PM. And they showed profound differences in the hormonal responses to that meal. So, particularly with blood sugar and insulin, they showed that peak glucose increased by 30% by eating the meal at 8:00 PM. There was an 86% increase in the total glucose blood sugar

response and 66% more time spent in hyperglycemia and high blood sugar levels than the same exact meal consumed at 8:00 AM.

**Ari Whitten:** So, this is just one example of a larger body of research showing that consuming lots of your food at night disturbs circadian rhythm and disturbed sleep. It also impairs autophagy, mitophagy, and glymphatic drainage, cleansing the brain of these toxins every night. So, there are many different effects there. It also impairs the growth hormone response and causes insulin sensitivity, which, when that's happening with the melatonin surge, melatonin actually amplifies insulin resistance as well. So, there's a lot of interplay of basically why consuming a lot of your food at night is, no Bueno, for your metabolic health.

**Dr. Wendy Myers:** I can attest to that because I just spent five weeks in Argentina, and they eat at night. The restaurants don't even open until eight o'clock.

**Ari Whitten:** Yeah.

**Dr. Wendy Myers:** And I was just being tortured because I'd be eating at 8, 9, and 10 PM and wanted to go to sleep. And it was just terrible. You can't even eat before 8:00 PM, because the restaurant doesn't open. And so I spent five weeks pretty much doing that. It's a big departure from mine. I usually eat in an eight-hour window and felt a huge difference there. And gained weight. Definitely, I gained like five pounds when I was there because of this difference. And there's a little wine involved too. Yeah, it's not optimal for sure.

**Ari Whitten:** Yeah. My wife is from Chile, and when we go to visit her family down there, they have meals at 10:00 PM and stay up, eating the food till midnight. And I'm like, "What are we doing here, guys?"

**Dr. Wendy Myers:** I can't do this. I mean, I eat at five.

**Ari Whitten:** Yeah.

**Dr. Wendy Myers:** They just set their minds on that.

**Ari Whitten:** Yeah. And then I'll mention one more thing, which is calorie stacking, and kind of in a similar vein to what I was just describing. There are a number of studies that have basically taken equal calorie diets. And, they will either have people consume the bulk of those calories in the earlier part of the day or the later part of the day. So, either you have a 1200-calorie diet with a 200-calorie breakfast and an 800-calorie dinner, or an 800-calorie breakfast and a 200-calorie dinner. And, those studies consistently show greater weight loss in the group that stacks more calories earlier in the day, even though it's exactly equal amounts of calories consumed.

**Ari Whitten:** And the reason why isn't because calories are nonsense and calories don't matter. Because you're signaling to the body, with a larger meal earlier in the

day, you're signaling energy is available. Energy is abundant. Food is available. And the body actually up-regulates energy levels. It up-regulates something called NEAT, non-exercise activity thermogenesis, which is basically all the twitching and fidgeting you do throughout the day, and how many times you get up from your seat and move around. The internal subjective urges and non-conscious urges that you feel about moving your body are determined by that, and they account for hundreds of calories burned each day. So, the body dynamically shifts that in response to whether there is perceived calorie food abundance or if energy is scarce, then down-regulates energy expenditure in response to that.

**Ari Whitten:** So, when you spend your whole day with the signal that energy is scarce and the body down-regulates energy expenditure, and then, before bed, you consume a huge amount of calories, the bulk of your daily calories, then your body doesn't even have time to burn it off like it does if you consume the bulk during the earlier part of the day. So, that's why those studies find that. And there's a number of studies that have shown that actually over 50% or 60% of Americans consume, I believe, it's like 68% of their calories after 6:00 PM, on average.

**Dr. Wendy Myers:** That was me in Argentina, for sure.

**Ari Whitten:** 98%.

**Dr. Wendy Myers:** 98% of my calories after 8:00 PM. Yeah. So, let's talk about some of the super foods that people can eat to optimize energy production and feed their mitochondria.

**Ari Whitten:** Okay. So, I have a few animal-based superfoods, and I have a few plant-based ones. So, I would say, in terms of plants, pomegranates, beets, broccoli sprouts, and spirulina, I would say those are probably some of my favorites. There are many more in the book, but I don't want to give a huge list here. Broccoli sprouts have sulforaphane. This has become more widely known now, and sulforaphane has a number of benefits, including stimulating mitochondrial biogenesis and stimulating the ARE, the antioxidant response element, building up that internal antioxidant response system of your mitochondria, helping them become more robust and resilient and resistant to a broad range of other stressors, and helping them also to better detoxify different chemicals and heavy metals and things like that.

**Ari Whitten:** Beets have some wonderful compounds that help modulate nitric oxide levels and blood circulation. And there's some wonderful research showing that this actually is significant enough to translate into improved athletic performance, so improved energy and improved stamina in athletic performance.

**Ari Whitten:** Pomegranates have a compound in them. They're one of the richest foods, or perhaps the richest, maybe the top two. I think chestnuts are up there as well, in a compound called ellagic acid or ellagitannins. And ellagic acid is converted by a

specific bacteria in the intestines into a compound called urolithin A. And urolithin A has been shown to be basically the most powerful promoter of mitophagy ever discovered. Mitophagy, again, is like autophagy at the mitochondrial level, basically cleaning up damaged, dysfunctional mitochondria and rebuilding healthy ones. So, pomegranates are absolutely wonderful for stimulating mitochondrial cleanup and repair.

**Dr. Wendy Myers:** Would that include just drinking the juice? Or do you need to actually eat them?

**Ari Whitten:** You will get some benefits from drinking the juice as well, but potentially. In general, the juice is not great for blood sugar levels. So, yes, there are good compounds in the juice, but it's better to get it from the whole fruit in general rather than the juice, as a general principle, across all fruit.

**Ari Whitten:** So, in terms of animal foods, beef liver, oysters, and salmon roe are some of my favorites, and actually, pastured eggs. And the beef liver is basically like nature's multivitamin. It's just packed with good stuff. And oysters are packed with minerals like zinc, selenium, and iodine. And also, obviously, if you're eating raw oysters, you're getting a huge amount of omega-3s in their raw, pristine, undenatured form. So wonderful super food there. Salmon roe eggs, which are often, most typically you eat with sushi for most people, are another wonderful food for that as well, and it's extremely rich in omega-3s, and they're in a phospholipid form. The phospholipid form helps provide phospholipids that help repair mitochondrial membranes. So, that's another advantage of that.

**Ari Whitten:** And the pastured eggs they're rich in a number of different compounds, vitamin A and vitamin D. Obviously, it's one of the best sources of protein, and it's also rich in two compounds that are also found in abundance in greens, green leafy vegetables, called lutein and zeaxanthin. And lutein and zeaxanthin are actually even more bioavailable when consumed from eggs than it is from greens. Not to say that consuming it from greens is bad. It's great. It's just that eggs are even more bioavailable and that lutein and zeaxanthin are very important compounds for protecting neurological health and against brain degeneration and protecting the omega-3 fatty acids that make up such a huge portion of our brain.

**Ari Whitten:** Those carotenoids, pigments, and phytochemicals from plant foods and eggs, from egg yolks, play a huge role in protecting those omega-3 fatty acids from oxidation and becoming rancid. And that's been shown, not just mechanistically, sort of theoretically, yeah, they protect against omega-3s, therefore, they're going to be beneficial for brain health. But it's actually been shown in numerous studies that higher levels of lutein and zeaxanthin consumption and buildup in the brain are, in fact, hugely protective of dementia and Alzheimer's and neurodegenerative diseases.

**Dr. Wendy Myers:** Yeah. And so, you talk about, earlier in the show, about how we start losing our mitochondria about 10% a year. Are a lot of these strategies that you talk about as a way to multiply mitochondria. How do you produce more mitochondria?



**Ari Whitten:** Yeah, a great question. So, the short answer to that is hormetic stress. We need hormetic stressors in our life to challenge our mitochondria, to temporarily stress them. And by stressing them, they are stimulated to adapt, grow stronger, and create more mitochondria to create mitochondrial biogenesis.

**Ari Whitten:** So, a couple of things that I want to add to this earlier point I made about the loss of mitochondria, people might think, "Well, gee, that really sucks that we lose our mitochondria as a result of the aging process." Well, when we look at 70-year-olds who are lifelong athletes and exercisers, they have the same mitochondrial capacity as young adults. They don't lose 10% of their mitochondrial capacity with each decade.

**Ari Whitten:** And what that means is that the loss of mitochondria is not a normal product of aging. It is a normal product of the modern, non-hormetic lifestyle, where we don't have these different types of hormetic stress built into our lifestyles anymore that we had for millions of years of our evolution. We had movement and exercise built into our lifestyle. We had exposure to the elements, cold and heat, built into our lifestyle. We had phytochemicals built into our lifestyle from the foods that we were eating. We had a temporary food shortage built into our lifestyle. We didn't always have grocery stores, fast food restaurants, and refrigerators a few feet away from us. Sometimes we had to go through periods where we didn't have food. And all of those are types of hormetic stressors that stress your mitochondria.

**Ari Whitten:** And by stressing them, temporarily, in those ways, they're stimulated and kept strong in the same way that, if you lift a heavy weight, your muscle is challenged and stimulated to adapt to that challenge to grow stronger. And it does that by growing more muscle fibers and building more strength in that tissue.

**Ari Whitten:** In the other way, if you break a bone and you have a cast on your arm or your leg, your body basically goes, "I guess we don't need all that energetically costly muscle tissue anymore to survive. Let's get rid of it." And that is exactly the same process that your body does internally, at the cellular level, with your mitochondria. If your mitochondria aren't being challenged, the body causes them to atrophy, and they literally shrink and shrivel and die off, and you lose those mitochondria.

**Ari Whitten:** The only silver lining to this is that the process can also be reversed. You can stimulate mitochondrial biogenesis by using hormetic stressors, engaging in different types of exercise, engaging in breath hold practices, engaging in heat exposure like a sauna or living in a hot place, cold exposure, fasting, and different kinds of phytochemicals. Things like sulforaphane and curcumin and resveratrol and pterostilbene and cytokines and EGCG, and so many of these other phytochemicals are stimulators of mitochondrial growth and biogenesis, and what is called sometimes in the literature, exercise mimetics, because they

stimulate many of the same cellular pathways and mechanisms of building up the mitochondria as exercise does.

**Ari Whitten:** So, all of those different types of hormetic stressors are critical to challenging the mitochondria to keep them strong.

**Dr. Wendy Myers:** Fantastic information, as always. Super, super interesting, in-depth, well-researched, so anyone listening, go check out Ari's book, [Eat For Energy](#). It's available now on Amazon. You also have a great program called [The Energy Blueprint](#), which you guys, 2 million people, have taken this course. Just really amazing and phenomenal success, for a reason, because you're just so well-read and well-researched and present all this information in a very easily digestible, actionable way. So, can you tell us where we can learn more about your work and your book as well?

**Ari Whitten:** Yeah. Thank you so much, my friend. I really appreciate that. And yeah, the new book, I would say, just go there, just focus on that, and you can get that on [Amazon](#) or [Barnes & Noble](#), wherever you want to buy books online, and it's called Eat For Energy.

**Dr. Wendy Myers:** Fantastic. And, everyone, have you guys liked this show? Ari's been on The Myers Detox Podcast several times, so you can go check out those shows as well. We did one on red light therapy, which was super, super interesting. So, everyone, thanks so much for tuning in to The Myers Detox Podcast. I'm Dr. Wendy Myers, and every week I want to bring you the world's experts on every facet of improving your health because you deserve to feel good, and I want to help you on your journey to get there. So thanks for tuning in. I'll talk to you guys next week.