# The Role Mitochondria Play In Producing And Enhancing Your Energy Transcript

(Transcripts are generated by AI and may contain errors)

## Introduction to Ari Whitten and Mitochondria

– Hey everyone welcome back to the end, chronic stress, fatigue and burnout. The medicine and mindset summit. It's Jana here back with you and I am excited to introduce you to our next guest speaker.

This is Ari Whitten. He is the founder of the Energy Blueprint. Let me tell you a little bit about him and how he shows up in this world. He's the best selling author of the ultimate Guide to red light therapy and eat for energy, how to beat fatigue and supercharge your mitochondria for all day energy.

He has a Bachelor of Science in kinesiology certifications from the National Academy of Sports Medicine. As a corrective exercise specialist and performance enhancement specialist has completed extensive graduate studies in clinical psychology and holds a master's of science degree in human nutrition and functional medicine?

Ari is a timeless researcher who has devoted the last 27 years of his life to being on the cutting edge of the science of health and human energy optimization.

You can find his podcast programs and supplement formulas at theenergyblueprint.com. And today we're talking all about the role of mitochondria um in producing and enhancing your energy. So Ari welcome to the medicine of mindset virtual stage. – Thanks so much for having me, Jana. It's a pleasure to be here.

– Okay, so can we start off with just a basic definition for everyone here.

## What Mitochondria Do and Why Fatigue Happens

Can you explain what mitochondria is? – Sure. So um we have trillions of cells in our body, our brain, our muscles, our bones, our blood cells are immune cells are liver cells or pancreas, our thyroid gland cells are sex gland cells, everything in your body is composed of cells.

Those cells work to the extent that they have adequate power energy supply. Virtually all of the energy provided to virtually all of the trillions of cells in our body come from mitochondria, which are little power plants.

What we learned in high school and college biology and physiology courses are the powerhouse of the cell. If you watch jeopardy and it comes up, you know, powerhouse of the cell, everyone's gonna know mitochondria.

Unfortunately, that's about where most people's knowledge of mitochondria starts and ends. So everybody knows that they remember that from high school biology class.

Um but it turns out in the last 20 years, especially the last 10 years, there's been an enormous body of scientific literature that's emerged around the central role of these mitochondria in our in human physiology and in dictating our risk of many, many different chronic diseases.

Our energy levels, of course how fatigued or energetic we are because of course, what could be more central to that than our cellular energy generators.

And interestingly enough for most of the last several decades, we've been uh confused and I would say bewildered by all sorts of convoluted explanations of what regulates our energy, Like. For example, that our adrenal glands produce this hormone called cortisol, which influences, our blood sugar and that with chronic stress, it wears out our adrenal glands so they can't produce enough cortisol and therefore, you know, your your energy level, you get fatigued as a result of adrenal burnout, adrenal fatigue.

I would argue that most of that is nonsense and that, sorry, hopefully I'm not offending you. Um we can talk about

that if you want and and why I say that and that mitochondria are very much at the center of this rather than the adrenal glands and cortisol story. Uh and also it's at the root of the aging process itself. So there's a lot of research around the what's called the mitochondrial theory of aging or the mitochondrial free radical theory of aging.

And um essentially to boil down a lot of very complex research. The gist of it is how fast you aged is determined in large part by the health of your mitochondria and the status of your mitochondria, which is something I hope will talk in detail about as far as what I mean by those things.

Um and the one uh maybe other layer I'll add to this just to get us started, is related to burnout related to fatigue. One of the biggest discoveries which is largely in the last 10 years and and thanks to the work of a researcher who runs a lab for mitochondrial medicine named um Dr. Robert Navio, brilliant guy who I've had the pleasure of meeting in person at his lab at the University of California San Diego. And he published a paper, uh he's published a few seminal papers that are of great importance one the most important of which is called the cell danger response. And the basic concept, the central concept of this work is that mitochondria are these things that we were all taught about as in biology and physiology courses as these sort of mindless cellular energy generators they take in carbs and fats and oxygen and they pump out a TP cellular energy.

## Why We Miss the Real Causes of Burnout

And you know, so the story is almost implied as if it's like all you gotta do is supply them with carbs and fats and you got energy. Well, it turns out that mitochondria are are much more than mindless energy generators in our body. And they are actually in Dr. Navio's words, the central hub of the wheel of metabolism, metabolism is the total summation of all the biochemical reactions that are occurring in our body, basically all everything that's happening in your body is your metabolism.

Mitochondria are the central hub of the wheel of that. And more specifically, they have this second role. Its newly discovered really in the last 10 years.

Um beyond just their role is as energy generators. And that is, they are environmental sensors. They are essentially like the canaries in the coal mine of our body. And they are constantly asking the question, They're taking samples of the environment, what's going on in the body.

And they're asking the question, is it safe for us to produce energy, is it safe for us to produce energy? So mitochondria not only produce energy but they are deciding whether or not the body should be producing energy whether the body is going to be in energy production mode or defense mode, either peacetime metabolism or wartime metabolism.

And to the extent that mitochondria are detecting threats or dangers or stressors present that surpass their capacity to cope with that stress. They are turning down the dial on energy production and shifting resources towards cellular defense. And that is fundamentally what fatigue, chronic fatigue is.

– Okay, there's a part of me that's like I just feel like I just got told that Santa's not real.

## Finding Your Biggest Energy Drains

You know, one of those, one of those moments um why why I'm going to ask this question later on, but I feel like I want to ask it now, why why are we not talking about this more?

– Which one? The cell danger response or the what I said about adrenal fatigue not being real. – Starting out with adrenal fatigue not being real. But then following that up with the response piece. – About the cell danger response and the dual role of mitochondria?

There are actually, you know, I've been talking about this for seven years now um and when I was initially talking about it, there was almost nobody who had even heard of it.

Maybe like I had I knew one of our my my colleagues, our colleagues who was talking about it but beyond that almost nobody and um doctor actually I can think of to um Dr. Ben Lynch who is a gene expert and Dr. Maya Shetreat. Both of them are friends of mine, they were probably the only two people that I know of that we're talking about this many years ago. Um but in more recent years I'd say in the last year a lot more people are talking about it. Um and that's a natural thing, like you know, the people who are talking about it get on lots of summits, do lots of interviews and then more people find out about it and you know sort of it starts to make sense to people. Word gets out.

Um I just interviewed another expert on my podcast named Dr. Eric Balcavage, Balcavage. I always wanna French friendship his name a little bit. Um And he is connecting the whole cell danger response stuff to hypothyroidism and autoimmune. Um Hashimoto's so um super interesting stuff. So there's a lot of people really connecting the dots in novel ways now.

– So let's talk about fatigue because one of I mean it's right in the title of this summit, right? And chronic stress fatigue and burnout. And so let's can we talk about the cycle of feeling like we are fatigued, We are burnt out. We don't have the energy we need to break out of the cycle. So we might try a supplement or a new exercise class or we might download an app that helps with our mindset and then we find ourselves in that um like the New Year's resolution kind of Groundhog Day where we like been there, done that and we and we get stuck again and again and again and then that plays with our mind set that we can't be successful and maybe this is just how my life is supposed to be.

Where would someone with this information start to make a shift or a little bump in removing themselves from that cycle of fatigue or burnout? – Can you be more specific? So where would somebody with what, what information? – Just knowing that, because like you said, I mean the the narrative or the story of you know the adrenals pumping out the cortisol maybe isn't the whole story or maybe you know we've gone past that story. So people are just kind of receiving this information from you today.

Should they go to google and start googling this? Or what would be a natural first step is that dialing it in a bit more? – A natural first step to recovering your energy levels?

Okay, so so taking what I just explained about the cell danger response about mitochondria regulating deciding whether the body is going to be in energy mode or defense mode, we need to look at our individual sources of stressors in our life and our mitochondria can detect virtually every type of stress or stress or imaginable from poor nutrition to sleep deprivation to psychological stress and emotional stress. Spiritual stress, you could say though I have an aversion to that word to some extent.

Unfortunately, we don't have much of a better word to environmental toxicants to physical injury and overtraining to respiratory infections. You name it, It can detect any of these sources of stressors.

So if we're struggling with chronic lack of energy, what we need to do is ask the question, why are my mitochondria deciding that it's unsafe for them to produce abundant energy?

And instead they're shifting my metabolic machinery, cellular engines of my body towards a defense mode function instead of an energy mode function? What is it that is present in my life that is making them that is signaling to them that it is unsafe and that they need to go into defense mode.

So we need to do a self inventory of examining what's going on in in our life. Is it that we're eating a standard American diet? Is it that we are um maybe to harp on nutrition? 11 more.

Is it that we have deluded ourselves into thinking we're eating a healthy diet, but we're actually slipping in lots and lots of junk and still eating way too much?

And is it that we're overweight and insulin resistant? Is it that we are not adequately exercising. Um, but are maybe deluding ourselves into thinking that a walk a few times a week is enough exercise to keep our metabolic machinery optimal. Is it that we have uh sources of toxins in our life because our home is toxic. Our personal care

products are toxic.

We're not taking adequate care to drink pure water to eat clean food to breathe clean air. Um Is it that we are psychologically stressed due to toxic work, relationships or personal relationships, intimate relationships, friendships, family drama. Is it that we hate our job and don't feel any connection to our sense of meaning and purpose in life?

Is it that we're lonely and socially isolated and separate from any sort of family and community? Is it that were physically overtraining doing because we're exercise addicts and doing way too much exercise, right? And is it that we're chronically sleep deprived because we're workaholics and we're um just trying to function.

You know, we got people like Tony Robbins who don't get me wrong, I like a lot of what he has to say, but he also perpetuates I think a bit of bad information around sleep, which is that, you know, we can all function with four hours of sleep five hours of sleepish like he does. Um Well a lot of people can't, most people can't and shouldn't try to um And and uh if you do, you're chronically sleep deprived, you're chronically missing out on an hour or two of the sleep your body needs and your brain needs to fully recover.

You're not, I'm gonna be at your peak mentally and physically, you're gonna get sick more often. The neurotransmitter systems in your brain that regulate mood and energy and motivation aren't going to be at their peak.

And many other things will suffer as a result of, you know, low level chronic sleep deprivation, simply not getting an hour of sleep that your body actually needs. And you're chronically sort of going to bed a little too late, waking up a little too early compressing that that window of time and that has far reaching consequences on everything on mitochondrial function.

Um we can certainly talk about the links between sleep and circadian rhythm and mitochondrial function. But um the point is, we have all of these potential sources of stressors in our life. We have to do a self inventory and figure out what is the one big thing or the two or three big things that we have going on in our lives that are creating this signal to our mitochondria where they're interpreting what's going on in our life as there's too much stress present.

We are going to turn down the dialogue on energy production and shift resources towards cellular defense. So number one, and there's sort of two big steps to my system. I'll leave it here for now.

But the first big step is, you must start to minimize and eliminate the big triggers of the cell danger response, the big factors in your life that are shutting down your mitochondria. – What you're saying right now is really resonating with me. Um, and just really quickly, so I sold my bricks and mortar business, we closed the deal on the 31st of December.

And so this month has been lots of extra stuff that I have to do to transition and on friday we were migrating my google workspace and I lost my whole calendar, I lost all my email and it was enough to actually send me into a bit of a tailspin like uncontrollably crying.

## How Stress Can Trigger a Rapid Crash

Normally I could deal with those things and you know what happened to me in the middle of the night, I got up to go to the washroom and I came back to my bed and I simply turned on my right hand side, the room started spinning like I couldn't stop it.

And I immediately got sick to my stomach. I had to crawl to the bathroom to get sick and I went through sweating and shivering uncontrollably for six hours and my husband is at work back in Canada, my my kids couldn't hear me calling for them.

So I ended up falling asleep on the floor in our bathroom until the morning. And so as I hear you talk about these triggers and I know it's a phase and I, I know that a lot of us use words like I just got to push through.

I just got to get through the next month or I just got to get through the next week. Can you help me understand when, when our mitochondria are dealing with something?

Like what my body was obviously in defense mode really made in a major way and I'm feeling much better and I, you know, but how quick can they shift from the defense to that energy mode?

– Yeah, great question. So uh the the answer is complex and nuanced. Um the the it really depends on degrees, right? Um so let me give an analogy, like let's say um You do a workout lifting weights and your muscles are burning and they're super fatigued and in that moment uh you cannot do another rep of bicep curls because your biceps are just on fire. Okay?

But if you give them 60 seconds or two minutes, you can do a whole other set, right? So there's some recovery that takes place and there's lots of layers to this story. In this particular instance, there's the accumulation of hydrogen ions and lactate and the central nervous system is regulating how much it's allowing these muscles to contract and so on.

But there's basically there's a moment or maybe some seconds, some tens of seconds where it's impossible to do another bit of activity. But if you give it a period of time, a minute or two, you can do a lot more, there's recovery that takes place.

There's um stressors that are like that where it's very quick to you know get into a mode where the body is shutting things down uh And it's also fairly quick to recover. Let's say the flu or food poisoning or Norovirus or something like that.

Norovirus is what people call a stomach flu. Um You sometimes these things can be one or two days long and during that you have a big surge of oftentimes inflammatory molecules in the bloodstream, sometimes bacterial toxins, what's called LPS or endo toxin in the bloodstream uh that are directly shutting down the mitochondria. The mitochondria are determining their their unsafe. We're going to shift into defense mode And um that may last only 24 hours, 48 hours and maybe you've recovered your energy.

There are other types of things that may occur severe emotional trauma toxins of severe degrees. Um Really chronic exposure to certain stressors that are chronically overloading the system for weeks, months years and these kinds of things can trigger very lasting um cell danger response type activations. In fact it's possible in the in the view of Dr.

Robert Navio two for for the body for the cells to to some extent become locked into that mode for very long periods of time. So and and that depends on number one, what is the health of that individual and number two, what is the severity of the stressor and the duration of that, that stressor that they're being exposed to?

## Sleep, Circadian Rhythm, and Melatonin

If it's a healthy person, let's say, a healthy young kid exposed to an acute stressor, they're almost always gonna bounce back very quickly If it's an older, you know, middle aged person who's not very healthy whose mitochondria are are weak and dysfunctional and they're exposed to a severe acute stressor or a severe chronic stressor uh probably not gonna bounce back very quickly.

– Okay, and I want to look back to sleep and circadian rhythm because I think that's it always seems to be a hot topic. And then I'd like you to touch on gut health, the relation between gut health and mitochondria.

So let's do sleep and circadian rhythm first. – So there's a lot of different layers that are going on with our sleep to to fully understand this. It's critical to understand our circadian rhythm and circadian rhythm is our 24 hour biological clock, essentially. Um so we have a biological clock built into our brain, it's in a part of the brain called the super key asthmatic nucleus and that circadian rhythm influences many, many different neurotransmitters and hormones that impact on virtually all of the systems of our body, but heavily impact upon our energy, our mood, our cognitive function and our sleep and wake cycles and other things like libido and sexual function and body

composition and insulin sensitivity and things like that.

So, to give you a a sampling we know, circadian rhythm ties into dopamine serotonin, Gaba and orexin. These are neurotransmitters that are directly involved in wakefulness, energy, mood motivation.

So if you don't have a healthy circadian rhythm and healthy sleep wake cycles, you will basically, by definition not have optimal neurochemistry in your brain.

Okay, now, in addition to that, we also know that the circadian system ties into many different hormones. It ties into thyroid hormone, which has a diurnal curve of activity. It's higher in the morning, lower in the evenings. Same for testosterone, same for cortisol. Melatonin is on the opposite rhythm.

So melatonin is low during the daytime and then spikes at night um and growth hormone as well. And we know that leptin and insulin also tie into the circadian rhythm are heavily impacted by circadian rhythm as well.

Um as well as hunger hormones that also influence how much you eat, how quickly you're you're likely to feel full from the food you are eating, which ultimately influence your body composition heavily how fat or lean you are.

Now, um there's an expression that I like and it's uh if you have, if you have an orchestra but no conductor you have noise. If you have an orchestra with a conductor, you have music, the circadian rhythm is the conductor of all of these neurotransmitter and hormone systems in our body. So if you want to make physiological hormonal music in your body, you must have a strong circadian rhythm.

If you want to have optimal energy levels, mood, cognitive function, sexual function um Be at your peak brain and body, then you must have a strong circadian rhythm, it's critically important. And just to make this point, we also know that disruptions in the circadian rhythm, the most extreme of which are things like sleep deprivation, um even low level sleep deprivation, an hour or two less sleep than than you need every night, but the most extreme is night shift work.

Okay. Um and we know this is the only job in the world that's classified as a carcinogen where the actual job itself is carcinogenic. Um So you're not like exposure to toxins while on the job, there's lots of industries where that's the case.

Um but the, just working at that time of day being awake instead of asleep is increasing your cancer risk dramatically and it's increasing your risk for dozens of other diseases, neurological diseases, Heart disease, obesity, diabetes, uh you name it, okay, It is bad bad news. Um and it's because the circadian rhythm is critically important to your physiology to function.

Now, one of the things that happens when we sleep is argh lymphatic system in our brain, which is a lymphatic system That is unique to the way the brain is structured.

It has to do with glimpse if it has to do with glial cells which form a what they call a glimpse, static system. So we don't have a traditional lymphatic system with vessels up there. What we have is a system where these glial cells in the brain basically expand that night, create larger spaces and the brain flushes itself out of the accumulated toxins of the day. So number one it's critical to understand if you don't have a strong circadian rhythm, if you're not sleeping enough and if you're not sleeping well, your brain will accumulate more toxins.

It will not be able to efficiently do this Glynn fat IQ cleansing process each night. Um Sometimes called brainwashing though a different kind of brainwashing.

The good, the good kind of brainwashing. We wash and clean out our brain every night while we sleep and it depends upon the health of our strength and the quality of our circadian rhythm and the quality and duration of our sleep.

Now. Um in addition to that there's a really important hormone, one of the hormones I mentioned there that are tied

to the circadian rhythm and it's called melatonin almost everybody's heard of melatonin most, some people just think of it as a supplement. Like you buy a dietary supplement with melatonin. Some people know that it's produced in the body.

Some people know it's a hormone but what most people what what most people think of it as is a sleep hormone. That's this sleepy molecule and um of course it is related to sleep. But it turns out that melatonin is actually much more than that. Melatonin is the single most potent mitochondrial antioxidant in existence and it's also has it also has extremely potent neuro neuro protective effects for our brain and anti cancer effects.

It is vital for lowering your risk of cancer to have adequate surges of melatonin each night before and during sleep. Now taking all that in middle. Melatonin is vital for mitochondria, vital for protecting you from brain disease, vital from protecting you from cancer.

It's also important for lots and lots of other things. But just to name those three things now consider that we know that's being in a normal home under standard room lighting Suppresses melatonin levels by 70%.

Okay so most people are suppressing this nightly melatonin level surge By 50-70% plus every single night month after month, year after year, decade after decade for literally multiple decades of their life.

What happens if you're chronically suppressing a hormone that has anti cancer effects? Might raise your risk of cancer? What happens if you suppress a hormone that has neuro protective effects? Can increase your risk of brain decline and brain diseases neurodegenerative diseases? What happens if you suppress a hormone that is vital for protecting your mitochondria from damage and allowing them to recharge each night while you sleep And I should maybe add one layer to the story.

Melatonin not only directly protects mitochondria, it interacts with what's called the A. R. E. The internal antioxidant response element. This is our internal storehouse of of antioxidants like glutathione and cattle A's and super oxide disputes that are what what mitochondria used to protect themselves from damage from toxins and other kinds of stressors.

So the melatonin surge that happens every night recharges that system of the mitochondria that allows them to protect themselves from harm for the next day.

So every night while we sleep were designed to recharge that system in our mitochondria, protect the mitochondria and help them recharge their antioxidant stores for the following day.

So what happens if you suppress a hormone that is designed to protect and recharge your mitochondria each night while you sleep you're gonna accumulate mitochondrial damage as you get older. So these are just a few of the effects of how critically important melatonin is for human physiology.

Um But you know the nature of, yeah I mean I guess I'll leave it there. I probably talk a lot longer on on sleep and circadian rhythm. But you get a sense of the importance of how critical having a healthy circadian rhythm and sleep cycle is every single night without exception.

– Well and while you were talking it made me think about how we freak out when we can't we forget our phone chargers somewhere because we gotta plug in our phone overnight So it's ready to be you know function for us in the morning yet we have that own system within us that I don't think we really realize how important it is so that we're recharging and I want to go back to um the comment about the standard lighting that is impacting, you know, 50 to 70% or suppressing that production.

What so what what would you recommend? Like, is it just a matter of using like light, warm light during the night time or what are some best practices?

Someone could be like, oh jeez, I just have to change that one thing and that would start to make an impact. What can we do? – Yeah, there's a few things um one is wearing blue blocker glasses are daily blue and green blocking

glasses because it's specifically the blue wavelengths predominantly and to some extent the green wavelengths of light that are actually feeding back into that circadian rhythm uh and basically giving the clock in the brain a daytime signal.

## Light Exposure Habits for Better Sleep

Uh It's it's daytime. It's the time to be awake alert. Active, energetic. So number one is in the evenings, at least two hours before bed. You want to switch to amber or red lighting in any area of your home that you're in. You want to wear blue blocking glasses.

You want to dim the lights in your home as much as possible. You want to switch the lights from fluorescent or LED S to incandescent or halogen um which mimic more the the light spectrum of firelight and candlelight as opposed to um fluorescent and LEDs, which have a lot more blue wavelengths in them.

Again, that daytime signal for the circadian rhythm. Um in addition in your bedroom and in your bathroom right before bed, it's important to understand that even a second of exposure to bright light is enough to profoundly disrupt the circadian rhythm.

So, you know, if you go into your bathroom and like most bathrooms, you have a bunch of bright fluorescent lights in there that are designed to light up your face really good as you look in the mirror. And if you switch that light on to brush your teeth right before bed or when you're taking a shower, you've got problems with your circadian rhythm. So you need to get used to having dim amber or red light in your bathroom um or candlelight or or dim incandescent bulb light uh in your bathroom, uh as you get ready for bed and the same in your bedroom, ideally very dim um amber or red incandescent light in the bedroom or candlelight if you prefer. Um And the one other thing that I'll mention here briefly is in addition, when you wake up, the most important thing to do for your circadian rhythm is within the first half an hour of the day, get bright light in your eyes. So ideally go outdoors, get that light in your eyes. If it's a nice sunny clear day, two minutes is enough. If it's a cloudy overcast day, more like 10 or 15 minutes.

Um and you can do something else as you do this, you can go for a walk, you can read a book or whatever you want to do, listen to a podcast or something like that, but every day needs to start like that. And if you don't do these things, if you are like most people and you you wake up and you're indoors in your home and you look at your phone light or your computer light or your tv light or you turn on your indoor home lights and you're indoors, you're getting ready, you're eating breakfast, you're showering, you're, you're getting ready to go to work, you then drive to work and then you go to your office and you sit indoors in an office all day in indoor light, looking at electronic screens and then you go home and in the evening you are under indoor light, looking at electronic screens and then you go to bed.

There is no differential in the light spectrum and more even more importantly, the light intensity that you were exposed to. You basically had indoor room lighting and screen lighting all throughout the day.

Outdoor lighting, especially on a bright day on a clear day is a thousandfold more intense light, an indoor office or home lighting. So when we get that we get a big spike in intensity that's signaling to our brain, It's daytime. The time to be awake alert, active energetic and it creates then when we go home and we're in more dim indoor lighting and particularly you can amplify this by doing what I said before about altering your indoor home lighting. Now you create a massive differential between the light intensity you were exposed to during the day and the light exposure in the evening before bed. And that differential allows that circadian clock to tell the difference between day and night very well and makes it less susceptible to the melatonin suppressing effects of artificial light at night.

So, and I'll repeat that. What it means is that in the first scenario where you're indoors most of the day and you don't get outdoor bright light, your brain is very susceptible to suppressing melatonin very strongly in the evening as a result of being under indoor home lighting, looking at electronic screens and so on.

If you got a ton of, doesn't need to be a ton. But if you've got ample outdoor bright light during the day and especially the morning, but as much as possible throughout the day, you create a big differential between that light

exposure intensity and the one that you have in the, in your home at night and that allows your circadian rhythm to not suppress melatonin levels so much in the evening before and during sleep.

– So then what about for those of us who spend a good majority of their day with a ring, light within arm's reach of where we are? How do we, like, does it matter that I can look out my big windows here and see outside and I can do that a little bit and then come back or what's the strategy around the ring light? – Ideally you um you have you have window, uh you have a window near your workstation and you have your maximizing natural light coming into your office as you're working.

Um what's really not ideal is if you're in an office space or a home office space, that's uh very dim and doesn't have a lot of natural light and um and you're just lighting with with artificial light sources.

So number one, getting, you know, just light from a window and skylights, lots and lots of natural light coming in. Makes a big difference. In addition, um what you can do during the day to try to, if you do have to be indoors and you can't get much outdoor light.

## Gut Health and Mitochondrial Function

Well actually before I go there, take breaks, go outdoors during the day as much as possible. Do go outdoors and get that light whenever you can um if you can't do that to the to the extent possible you want to create a differential in your light exposure using the artificial light. So you do bright artificial light as much as possible during the daylight hours. And uh and then in the evening hours you shift your artificial light set up strongly to be a much more dim environment and ideally shifting to more of the amber, red's incandescent as well.

– Amazing. Okay, such such good information. Um Now, before I ask the last two questions um for our interview, I do want you to touch on just can we dip our toe in the connection between gut health and mitochondria?

– So in in recent years we've discovered all kinds of what they call axis associated with the gut, the gut is connected to basically everything in our body. So we have what's maybe more commonly known as the gut brain axis. We have the gut immune access, we have the gut lung access, we have the gut skin access, we've got the gut muscle access, uh and we've got a gut mitochondria access.

The gut is connected to everything and it's certainly connected to our mitochondria as well. And there's a few different ways that it connects. Um One of those ways is uh we we know, for example, that in people with chronic fatigue there's research showing that you can predict um The the extent you can basically predict whether or not somebody has chronic fatigue syndrome by looking solely at their gut microbiome.

Okay, there's research where they've done this using a computer algorithm and they do with 90% accuracy. They can determine whether you've got chronic chronic fatigue syndrome solely by looking at your gut microbiome, which is interesting because there's no other test, there's no like gut, there's no blood biomarker or something like that, that would allow you to say yes, this person has chronic fatigue syndrome, it's a diagnosis made based on symptoms but in this case they can do it based on looking at the gut microbiome.

And what is associated with chronic fatigue is reduced bacterial diversity in the gut. You have many fewer species and um higher amount of gram negative species that are lipo policy. Sacha ride endo toxin producing bacteria basically. Bad bugs.

And this is what's called dysbiosis where you have uh oversimplification but an imbalance of bad and good bacteria and when that happens which largely happens as a result of poor nutrition and lifestyle factors.

You get this imbalance in the gut in these bacteria and these bacteria perform certain roles. So they are performing roles where they are breaking down certain nutrients in the diet and providing other nutrients, vitamin K. B. Vitamins, things like that.

So nutrients that we depend on are actually produced by microbes in the gut. Short chain fatty acids are another

big one. We'll talk more about that in a second.

Um In addition to that um these bad microbes this having a greater proportion of these gram negative endo toxin containing bacteria also lead to gut permeability. The endo toxin on these bacteria literally damage the gut barrier function. These tight junctions as they're called in our gut that allow the gut to be separate from the bloodstream and for the gut to be able to pull the nutrients it needs and leave the other stuff that it doesn't want behind when those tight junctions are not functioning well.

You have what's called intestinal permeability or leaky gut and that is induced by many you know poor nutrition toxins antibiotics. But just the presence of dysbiosis of these bad bugs and their endotoxin is chronically inducing increased intestinal permeability or leaky gut. And that is causing those bacterial toxins to leak directly into the bloodstream.

And it's been found in many studies in chronic people with chronic fatigue. They have high levels of bacterial endo toxin in their bloodstream. You should not have endo toxin in your bloodstream.

This is something that should stay in the gut and be excreted not be entering your blood. And we know that this IPS, this bacterial endo toxin uh is linked with obesity, with insulin resistance and diabetes with neurodegenerative disease with heart disease and it is directly mitochondrial mitochondrial mean toxic to mitochondria and will trigger it will cause damage to mitochondria and acts as a danger signal where mitochondria are shutting down energy production and shifting resources towards cellular offense now.

So when you have leaky gut when you have dysbiosis in your gut you're doing that to some extent chronically. In addition to that um these microbes having adequate amounts of some of the good bugs are performing certain roles like maintaining the gut barrier, the mucus lining of the gut barrier like Akkermansia muciniphila is maintaining the gut barrier lining in a healthy way. And other good microbes are um producing short chain fatty acids, things like butyrate and appropriate it and um and acetate and butyrate in particular is critically important for maintaining the health of the colony sites, the the cells in the colon and it gets transported in the blood to the brain and throughout the cells of the body, where it becomes an incredibly important fuel for mitochondria and helps facilitate optimal energy production.

So if you've got dysbiosis you've now got problems, you've got toxins that are mitochondrial toxins leaking into your bloodstream and you've got a deficiency in in compounds like short chain fatty acids that are meant to fuel mitochondria.

In addition to that certain microbes in the gut also take um other compounds from the diet and they manufacture things like spermadine and other what are called polyamines that are critically important for maintaining a pool of healthy mitochondria.

There's also phytochemicals like for example, alagic acid which is found in abundance in small amounts in many different types of berries most abundant in pomegranates and chestnuts. And this alagic acid gets um metabolized by bacteria in the gut and transformed into another compound called ura.

Within a and you're a within a is one of the most powerful promoters of Mitophagy ever discovered. Mitophagy is if people have heard the term autophagy, it's like cellular recycling. It's it's cleaning up damaged and dysfunctional cell, parts, Mitophagy is cleaning up damaged and dysfunctional mitochondria.

Its like a quality control process, I think of like a factory conveyor belt where you've got these products coming down the line, somebody, somebody's inspecting each one and going, this one looks good, this one looks good. This this one's dysfunctional, let's toss that one in the garbage okay, every night while you sleep.

And this also ties into sleep and circadian rhythm. Um your body does a quality control process of autophagy and Mitophagy in your cells. And um, this and and basically cleans up the pool of mitochondria. It gets rid of the damaged and dysfunctional ones and keeps the pool of mitochondria healthy. You're a within a is a critically important and these poly amines are critically important.

Um part of that quality control process of allowing your body to clean up and get rid of the damaged and dysfunctional mitochondria and keep the overall pool healthy pool of mitochondria. So, um basically our our gut plays a profound role in keeping our mitochondrial health mitochondria healthy, healthy gut, healthy mitochondria. – There is no part of our body that is not impacted by the health of the mitochondria, right?

It's just everything. – Almost every cell in the body is powered by mitochondria um with maybe one or two exceptions, Red blood cells don't have mitochondria, um but other than that, basically everything does.

## Hormetic Stress and Building Resilience

So all your organs, your muscles, your bones, your um yeah, basically everything is being powered almost entirely by energy coming from mitochondria. – So, so good. I know one of my first action items after we get off this call is I'm gonna go over to amazon.mx and order me summary written books because I need more of what you're talking about.

And so let's um if we have to loop back to anything you said that totally fine, unless there's something different you want to use to answer this question. But what do you think is not being talked about enough in um you know, in your area of expertise?

– Well, I mentioned earlier the first step of my system um of identifying the sources of stress that are triggering mitochondria and to sell danger into the cell danger response the second and I would say most functional medicine experts and health gurus are very much attuned to that.

They might not be speaking the language of mitochondria and cell danger response, but everybody is attuned to stressors and that it's having some negative effect on the body.

Um The second part of what I do is much more novel and used to be something that almost nobody knew about or heard about. Now, some people are starting to talk about it.

It's going to be the subject of my next book that's coming out in a year or so. And uh and that is for missus or hormedic stress. So this is something I would love to talk about for an hour, it's my favorite topic, but um I'll keep it very brief.

I'll try to, It basically is, you can think of it as good stress. It turns out the human body needs certain kinds of stress, it requires certain kinds of stress, inadequate amounts in order to function not just optimally, but to function normally.

Another way of saying that is the removal of those types of stressors from your life leads to abnormal cell and mitochondrial function. Okay, hormedic stress are things like of course exercise and all the different subtypes of exercise, from endurance exercise to lifting weights to high intensity interval training.

Um things like fasting, things like intermittent nutrient cycling or depletion. Um things like heat exposure and cold exposure. Things like phytochemicals in the diet, uh breath holding practices and so on. There are several other types of hormetic stress as well. Um These hormetic stressors present in our lives in adequate amounts are vital for allowing our mitochondria to function normally.

And much like if you put a if you've ever broken a bone, you put a muscle, you put a cast over your arm or your leg and you don't use those muscles for six or eight weeks if they're not being challenged and stimulated.

Guess what happens when you take that cast off six or eight weeks later you look down at your arm or your leg and it's half the size of the other ones were the same exact process happens at the level of the mitochondria inside of our cells when they are not being challenged and stimulated adequately. And the modern world, which is a world lacking in these hormedic stressors that I just described is essentially like immobilizing your mitochondria in a cast.

It causes them to atrophy and shrink and shrivel away and die off. And we know that Um from many lines of

research that with each decade of life, people use a lose about 10% of their mitochondrial capacity, such that the average seven year old has lost 75% of the mitochondrial capacity they had when they were a young adult. 75%. This is like going from a Ferrari engine in your cells to a lawnmower engine in your cells.

Okay. And what's important to understand about this is we also know that this is not a natural, normal byproduct of the aging process itself. This is so this is not it's not where humans are genetically programmed to experience this as we age. This is a result of modern lifestyles deficient in hermetic stress. And we know that because when we look at seven year olds who regularly engage informatics stress, They have the same mitochondrial capacity as a young adult, they don't lose 75%.

So that is a critical, critically important piece of the puzzle. Of, of course, if you've got a lawnmower engine in yourselves instead of a Ferrari engine, guess what? You're going to produce a lot less energy.

All your, uh, your muscles, your brain, your heart, your internal organs, your hormone producing glands are all going to function far less well if you've got a lawnmower engine in your cells as opposed to a Ferrari engine and that fact is a massive, massive, massive contributor to chronic fatigue and chronic disease that is largely um, not being talked about or not being talked about adequately, it's starting to be talked about now. Um, the good news is this process is dynamic just as lack of hormetic stress will cause atrophy of the mitochondria.

Doing hormetic stress, incorporating it into your life systematically will grow mitochondria bigger and stronger and stimulate a process called mitochondrial biogenesis.

The creation of new mitochondria from scratch. So we can alter this. The, as they say, the best time to plant a tree was 20 years ago. The second best time is now.

So now is the time, if you're not already now is the time to start growing bigger and stronger mitochondria and more of them. And this is an absolutely critically important part of the energy disease and longevity story.

– So good, so good. And I'm just gonna throw this out to the universe that maybe next year you'll come back to the summit and we can talk all about this just before your book launches. That's a great idea.

Okay, so before we wrap, um allow us into the mind of Ari Whitten, give us one hint or tip that is like a non negotiable for you in your own wellness from a mindset perspective that you know, you live by.

– Here's where I wanna go with this question. So based on like a lot of conversations with friends and family members and people like that who are health conscious, who are, you know, reading books about health and personal development and things like that. All these things that they have um ideas have their time, right? Certain ideas are popular for a period of time.

We, you know, look at diet as an example. It's like low fats, the big thing. No, it's Atkins and low carb and know that they've got it all wrong and really red meats trying to kill you go vegan and because saturated fat is bad and no vegans are all dying and they're terribly unhealthy.

They're skinny and frail. You need to start eating red meat because it's a superfood and go carnivore and go keto and go paleo and like all these ideas have their time they come and they go, um, and in general ideas are like that.

What I've noticed lately is there is an increasing awareness now in recent years around trauma and emotional stress, emotional trauma and what I'm gonna say might trigger some people here, but I think this is useful.

I hope you'll be open minded to what I have to say because it's coming from a good place. There's a lot of value in becoming more aware of and more conscious of our personal difficulties and traumas and childhood wounds and how that led to certain personality dimensions, traits in us and affected our course of development and so on.

Um there's there's great value in becoming aware of that. At the same time, I'm noticing a lot of people who have are developing what I would consider an excessive focus on those wounds, emotional wounds and I would say an

unhealthy relationship to them that is masquerading as a healthy relationship with to them, what I mean by that is people are, I think there's a lot of people that are becoming hyper fragile that are so concerned with the toxic effects of emotional stress or small traumas, you could say that they are trying to operate in this like perfect bubble of a stress free and a trauma free existence.

## Mindset, Resilience, and Closing Remarks

And um I think that that is a fragile mindset when you become fearful of having adversity, having emotional difficulties in your life and what I think we need to develop more of and and obviously there's a lot of gray areas here, there's like there's there's really horrific traumas that humans can experience and what I'm talking about here obviously does not include that like people can become severely debilitated and develop PTSD and um have have really horrible traumas and be Children and subjected to horrific parents who mistreat them in all kinds of horrible traumatic ways and I don't want to be insensitive, insensitive to that at all because I totally understand that situation, but I think that there's a lot of people who are really developing this fragile sort of relationship with stress and adversity and emotional difficulty and and trauma small traumas and I think um you know, they want to sort of talk endlessly about the negative effects of these, these different things and I think what's far healthier is to develop a mindset of being unbreakable, develop resilience, cultivate resilience and develop an attitude and a relationship with the stressors and the adversity and the challenges and the difficulties that you will inevitably inevitably encounter in life because they're unavoidable and develop an attitude of, you know, I I really like this frame, I've seen in a number of um of mental toughness sort of gurus who are oftentimes endurance athletes or military vets, some variation on the theme of it's all good, It's all good, one is one is, it's all good mental training, one is, it's all good or the other the shortest one is just good and the idea is whenever something bad happens, you go, it's all good mental training, this is all practice, that is helping me become a stronger wiser, more experienced, more resilient person and so one mindset that I think people can have then I observe a lot right now is a sort of fear and anxiety around difficulty and uh like oh my gosh I'm experiencing difficulty. I'm so triggered.

This is so traumatic for me, right? And then another attitude is bring it on, it's all good mental training. Any stress that I'm exposed to is going to make me stronger, wiser better, tougher, more resilient, more able to bounce back from future challenges. This is all part of me developing into a stronger, more resilient person. And I think that attitude shift take the same people encountering the same objective circumstance.

That attitude makes all the difference in the world. – Ari that was so well spoken. Um I love how you framed it. Thank you so much for your time for your wisdom.

I mean there are just boatloads of information for us to go back to and I actually want to put a plug in here um for the all access V. I. P. I haven't done this in any other um conversation but you guys when you upgrade to the V.

I. P. You actually get this in audio form so you can be out for your walk, getting your sunlight while you're listening to this. You can be you if you love to read, you get the transcript or you can watch this over again and I think for me I'm going to come back to this over and over because there were so many segments of just little gems that I want to thank you you know, for offering and um the energy blueprint dot com everyone is where you can connect with Ari.

Thank you so much. Um this summit just got a little extra sparkle because you were here with us today. So thanks again for being here. – Thanks so much. It was a pleasure.

– Alright Gang. Um you know what if it's daylight, where you are? Why don't you head out either by your window or go actually outside, grab your two minutes of sunlight and then come on back and join me here for our next speaker.