Mitochondria and Your Brain Are Regulators of Energy - Unlocking your secret energy powerhouse Transcript

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Introduction to Ari Whitten and fatigue

– Hey welcome welcome to another edition of Long Covid and Chronic Fatigue. And we're gonna be talking today with Ari Whitten and he's the founder of Energy Blueprint System and it's a comprehensive lifestyle and supplement program which has helped more than two million people and counting like that. Experience experience optimal health, better performance and more energy. And I think most importantly he is a man who is going to help you to live in the modern world. As he and I were just chatting, I think this is so important to to bring out is that we now live in a world that are spotty did not evolve to live in. And what our has given us is the the handbook of how to stay healthy, how to take care of yourself, how to really survive in this toxic world and thrive.

And he has courses and books and we'll let him introduce some of them at the end because I think they're really important resource for all of us as we try to live in are unfortunately more and more toxic world. And I think those of you have listened to this know that I'm a big believer that one of the reasons we have long covid chronic fatigue and the myriad other chronic illnesses of our time is because this mission because of this mismatch between our current environment and how this amazing system was designed to work.

So welcome Ari And let's start off, you know, I don't know where to begin, but how about almost at the end, let's just talk about how your what your thoughts are about how to deal with fatigue. Where do you think it starts?

Where do you how do you look at it? – Sure. That's a very broad question. How many hours do you have Eric? – Well, you know, I'll leave it to your discretion.

We can – Okay, well, thank you so much for for having me. Thank you for the kind words. It's an honor to be here with you and thank you so much for the invitation. I think fatigue can be thought of as having many different causes fundamentally. This is reduced down to a stress load and insult and attack on the system that exceeds the body's capacity to deal with it.

And to return to homeostasis. And when that happens, regardless of what the source is of that attack. You get a disruption of the system and you get the pathogenesis of certain disease processes or the shutdown of certain systems of the body and particularly the mitochondria.

Cell danger response and mitochondrial shutdown

We were chatting before this interview started about Dr. Robert Naviaux work, who has been life changing for me in understanding this this whole topic.

My personal story was the very very brief version of my personal story is that I dealt with my own chronic fatigue after suffering from mononucleosis.

And I went to conventional doctors, I went to alternative doctors and realized none of them know what the hell they're talking about when it comes to this energy story, you got the conventional doctors at least they know they don't know anything about fatigue, they don't really have anything to offer besides like antidepressants and stimulants and You know a recommendation to do cognitive behavioral therapy and walk for 30 minutes every day. The alternative doctors and functional medicine doctors were for most of the last several decades really obsessed with this adrenal fatigue model of of chronic fatigue which is just fundamentally not true.

We could spend an hour talking about that but the evidence doesn't support it. I'm sorry I just want to shout out and say thank you. I spent a full year of my life, believe it or not a year of my life.

I think I probably know that research better than I have to imagine all. But maybe maybe there's a handful of people on the planet that have spent more time looking at that research than I have but I can't imagine more than that.

And anyway, I realized like people don't there isn't actually an understanding a good scientific framework for understanding what controls and regulates human energy levels.

Why are some people chronically fatigued? How do we fix it? The biggest mover and shaker in in creating an understanding of that I think was Robert Naviaux work with the cell danger response. And for people unfamiliar with that, I know you're obviously familiar Eric your your personal friends with him and you've spent a lot of time talking to him and reading his research.

But the gist of it is you know, we've talked about mitochondria, we've known about mitochondria for over 100 years. These are our cellular energy generators. And basically what people learn about in high school and college and medical school graduate school, physiology and biology courses is we're mainly taught to remember these are the powerhouse of the cell they take in oxygen, carbs and fats and they pump out a TP cellular energy.

And that's for the most part, you know, other than going into the specifics of the electron transport chain and the you know, citric acid cycle in graduate level studies.

That's mostly what people know about mitochondria sort of they're taught about as these these mindless energy generators. And Dr. Naviaux work was revolutionary in that it synthesized this large body of evidence from all these different sources about mitochondria and all the things that the whole world of mitochondrial researchers were learning and really put it together in in terms of a coherent conceptual framework. And the gist of it is mitochondria are not just mindless energy generators. They have this other role as environmental centers that are constantly taking samples of what's going on in and around the cells.

And basically asking the question is it safe for us to produce energy and to the extent they're picking up on signals that the environment is unsafe and they can pick up on every type of signal you can imagine from poor diet to environmental toxicants, to sleep deprivation, to psychological stress, to physical, over training too.

Injury to respiratory, in fact, respiratory tract infections to you name it, to the extent they're picking up on those danger signals. They're shutting down energy production and switching shifting resources towards cellular defense and that is fundamentally the most upstream thing that is actually regulating human energy levels. So you asked me at the beginning of this, a very broad question, what what's causing fatigue?

It can be any number or any combination of these different factors and it can be things like poor nutrition, sleep deprivation, or or poor sleep or circadian rhythm disruption.

I'd say those are the two most widespread causes in the general population, not necessarily of severe debilitating chronic fatigue, but of sort of a more general lack of the youthful energy that we had when we were younger then we have things like environmental toxicants, we have things like light deficiency light toxicity.

We're not getting enough sunlight and all the different wavelengths, light nutrients that we get from the sun and we're getting way too much of certain parts of the light spectrum in the night time period.

We are also, we have massive problems with our gut health, which has a huge effect on things. There's what's called a gut mitochondria access. We know what's going on in the gut has a big impact on mitochondrial function throughout the whole body. And we have for medic stress as well.

And I think this is a really big part of the story that that I'm I'm very big on and that I think is widely neglected. That's starting to change, but it's been widely neglected within even natural health practitioners and functional medicine practitioners to really underappreciate this story of what hermetic stress does. Or medic stress, for people listening is transient metabolic stress that stimulates the system our body to make adaptations that ultimately increase its resistance to future exposures to stressors.

And not only to the stressor it was exposed to, but to a broad range of other stressors. It literally builds resilience into our body at the cellular level and the there's a few important things to understand about hermetic stress.

One is that our biology requires it this is not something that we go from like, okay, so we're at optimal health and then we can choose to expose ourselves to hermetic stressors to go to sort of a superhuman level of function.

Your biology literally requires exposure to Hormel thick stressors to maintain normal function. In other words, if you don't have these hermetic stressors built into your life, you will necessarily have abnormal cell function and you will have the generation of disease over time, certainly symptoms like fatigue and the way to understand this is it's easy if you've ever broken a bone. if you've ever broken an arm or a leg and you got a cast on for eight weeks and then you went to the doctor and you you got that cast on off, you look down at your leg and it's half the size as the other one.

Why? The answer is because if because that muscle wasn't being stimulated, it wasn't being challenged and because it wasn't being challenged, the body, which is basically ruthless.

It only cares about survival. So the body basically says, I guess we don't need that stuff anymore and it's just it's a liability for survival. It's not helping us survive. It's just all this energetically costly tissue that's consuming energy, but it's contributing nothing to our survival.

Let's get rid of it. Well, what we don't see outwardly like, we can see with muscles in this way is that that same process is happening internally at the cellular level with our mitochondria. And if we are not challenging them, if we're not stimulating them through these Hormel thick stress challenges on a regular basis, they literally shrink and shrivel and die off and we lose our mitochondria.

And it's been shown for this is not a small percentage. I'm not talking about 10% 20% loss of your mitochondria. I'm talking about the difference between, well, I'll give you some specific figures we know from studying athletes, for example, exercise physiologist, Inigo San Millan studies both athletes, endurance athletes and he studies Diabetics, overweight diabetics in this clinic. So the general population people who do lots of exercise the athletes, the endurance athletes have literally 400% more mitochondria in their cells.

Why sleep and circadian rhythm come first

This is your cellular engine, this is the system in your body, inside of your cells that is responsible for producing the energy that powers your cells if 400% more.

So, another way of saying this is and not looking at sort of the extremes of athletes, but we know among regular people, they lose about 10% of their mitochondrial capacity with each decade of life. And that maybe that sounds like a small amount, but the average seven year old Has lost 75% of their mitochondrial capacity.

Now the response to that might be. Well, Jeez that really sucks that. You know, we lose so much of our our mitochondrial capacity as we get older, But and you know, sort of aging sucks in that way.

But actually this is not a natural product of aging. This is a product of the modern lifestyle that is devoid of hermetic stress. And we know that because when we look at 70 year olds who are lifelong exercisers, they don't lose 75% of their mitochondrial capacity.

They have the same mitochondrial capacity as a young adult. So this is literally the reduction, it's like imagine you started with a Ferrari and then over the course of a few decades you now have a moped engine under the hood of your Ferrari. Okay, this is what's happening internally in our bodies and there's many more aspects of that story that go beyond um just the energy that's produced by it which I'm happy to talk about but I think we can leave it there for now. The general gist is the combination of sources of stressors in the modern lifestyle in the modern environment causing mitochondrial shutdown where they engage the cell danger response.

They're turning down energy production, shifting resources towards cellular defense combined with the overall loss

and atrophy of our mitochondrial cellular engine.

– That was beautiful. I've been trying to explain in in english the cell danger response and that was that made the live. I like that very much and I would like to and I think the pieces of stress as part so important for life is because we also need to be getting rid of cells that are not functioning well. And when we don't stress them that or Matic stress that you spoke about is what keeps us healthy.

We need to be, we're constantly having to repair and rebuild and if we don't practice that, you know then we don't we don't stay healthy. You know and it's just really um so important.

So and what I love about your program and how you think about things is you're giving people you know, a lot of people think of it as tools to stay healthy and today we're talking to a population that unfortunately, you know because of various usually infections is the final trigger. But as by now the people have heard, we've talked about many times. We do believe that for most people there is a significant toxicants load underneath and then a virus or another type of chronic confection that gets in there. And then we developed chronic fatigue or were a little overweight. And we have a lot of problems with insulin resistance and we get Covid makes this a little more likely to develop a long covid just as those chronic infections that your body may have been keeping in check before.

But now with the effects of Covid on our immune system specifically suppressing the cd eight cells. Prob and a bunch of others not good things were now stuck with chronic fatigue. And what's so exciting to me how your program and how your thoughts help people just start with the things that will make healthier people healthier or healthy people healthier. But really what everyone needs even if you're in even if you are in bed a good part of the day, there's so what where would you start with people, you know, let's say the people who maybe not in bed but they can know they only have a few hours of a function in a day, – Are you asking in general or specifically when it comes to hermetic stressors? – Well, I was, I think basically since, you know, I can I generalize quickly and to me, you know, exercise of course is, but you know, but a very diet is actually a hore medic stress because it often contains small amounts of stuff that in large amounts will kill you, but in small amounts just make your body work a little harder.

So yeah, so I would let you be creative. I mean you're, you're because I said, I know you you're, you're out there helping millions of people actually find a healthier life, but now you have people who have like fallen off the edge a little bit. And so imagine if they're in front of you, you know, like where would you start with your program with your way of thinking about helping people heal? – I think sleep and circadian rhythm optimization is generally the best place to start for most people.

Because it's just so vital for cellular repair and renewal. And as you also just pointed out, the cleanup process is the cleaning up of dysfunctional, sell parts and dysfunctional mitochondria processes like autopsy Ji and Mitofsky.

My to Fiji, so oughta Fiji is basically the process of identifying parts of the cell that are damaged or dysfunctional and sending them off for enzymatic degradation and basically rebuilding healthy new cell parts. Mitya Fiji is the same process at the mitochondrial level, this is a quality control process.

So imagine uh you know, I always, when I think of mythology, I think of like a factory and like a factory line of workers inspecting these these parts on a conveyor belt that are coming down the line and some of them are damn haven't been assembled, right? And so you take that one, you throw it, throw it away, you know that one, that one doesn't make it, you know, down the line to be sold. This process needs to be happening every single night while we sleep to maintain a healthy pool of mitochondria.

Otherwise we accumulate damaged and dysfunctional mitochondria that are not only not producing enough cellular energy but are also throwing off way too much reactive oxygen species. Way, way too much in the way of free radicals which are themselves a danger signal to mitochondria that causes mitochondria to turn down energy production right? And also leads to increase spell and mitochondrial damage that creates an inflammatory response.

And those inflammatory cytokines are a danger signal that cause the mitochondria to turn off energy production or

turn down the dial on energy production.

So getting these processes that take place at night while we sleep dialed in, I would say is almost without exception. The absolute best place to start for most people.

And that's because also if that is not optimized any other things that you do, whether it's trying to fix your nutrition or trying to take detox supplements, do a detox protocol, do a calculation protocol, starting an exercise regimen, whatever, whatever else they're doing meditation, whatever else you're doing, taking antivirals they're unlikely to yield much progress unless the sleep and circadian rhythm piece is in place.

– So and I don't want to demoralize people because I mean, but I want to hear what your thoughts for what people can contrive because what happens to a lot of these folks is that the inflammation has or their the the dangerous signals you say has so inflamed their system that now, you know, their vagus nerve isn't happy or their gut isn't happy, which is making their Vegas not happy and they're sympathetic sora mess, but we got to do our best. So you know, even if they can't be perfect.

My analogy or metaphor, I guess for people is that you know when you're trying to um you know, in the old days to raise a building foundation, you sometimes have to just jack it up a little bit on one side and then you can jack it up a little bit on the other and that's where I hope we can get people with the real sleep disorders because we're you know, it it might not be perfect, but even getting that 30% better is going to help the system and help that as you were alluding to the lymphatic, you know like just help the body clean itself. So just what what are some of the things that you that you really find that you know the basics that you found to make a big difference for people in your improving sleep.

– So first of all the understand that sleep is circadian rhythm dependent and we have a circadian clock literally a 24 hour clock built into our brain.

But the function of that clock which in turn regulates many different neurotransmitters, many different hormones. Things like um things like cortisol and melatonin and growth hormone and testosterone and thyroid hormone.

These are all hugely impacted by the function of the circadian clock. The that system functions well only if you're giving it the right inputs. And the primary input to the central clock in the brain is light.

It also has a few other inputs.

Melatonin: dosing, sensitivity, and light exposure

Movement is an input to some extent temperature as an input nutrition as an input. We also have peripheral circadian clocks and all of the tissues of our body from our skin to our heart to our intestine to our liver to our pancreas to our muscles. These all have their own circadian clocks that are primarily responsive to the environmental input of nutrition.

So light is the primary one. Up here, nutrition is the primary one throughout the body. If we want a strong circadian rhythm, we ideally want to be giving the right inputs to the whole system and we want to synchronize the two. Now the central clock optimizing light is the most important foundational aspect of that. And there's many strategies we could talk about, but the gist of them or the, I would say the most essential set of these strategies are get bright sunlight in your eyes within ideally the first half an hour. If not hour of waking up, get as much bright light as possible throughout the day. Bright outdoor light ideally and block out blue light in the evening at least a couple hours before bed.

But you can synchronize that to the rise and fall of the sun in your area and complete darkness in your bedroom. Okay, I'll add one more which is optimized the light environment of your home wherever you spend time in your home in the evening hours after the sun goes down.

So you want to get rid of the overhead led fluorescent lights and switch to dim amber or red lighting, candle lighting,

incandescent lighting. So turn off those, those ceiling lights, the typical indoor home lighting.

Get some simple little lamps that you can put in an old style incandescent bowl. The Edison style are very pretty and the spectrum is great. It's very close to the spectrum of candlelight or firelight and that is the ideal spectrum of light in the evening hours after the sun goes down. So if you if you optimize all of those factors, you will have a massive impact on your circadian rhythm, you will massively improve your sleep and all of these different parts of the human body.

Whether it's, we're talking neurotransmitters which affect energy and wakefulness and mood and motivation and drive. Whether we're talking about hormones like thyroid hormone and testosterone and cortisol and melatonin, which are hugely important hormones, They're all going to start to function properly.

And there's some of this can't be picked up entirely from simple blood or saliva tests because these hormones have a rhythm to them. They're high at certain parts of the day, low at others.

They're meant to work in tandem with some of these other hormones. And the best analogy for this is the expression if if you have a sympathy, if you if you have an orchestra but no conductor, you have noise. If you have an orchestra with the conductor, you have music and that's what the circadian rhythm is.

It is the conductor of this hormonal orchestra in our body. And we want it to be giving, we want to be giving it the proper inputs to create hormonal music in our body rather than hormonal noise. We want to be giving it the proper inputs to amplify the lymphatic drainage of toxins out of our brain to amplify autopsy, ji and Mitofsky to amplify levels of melatonin, which contrary to popular perception isn't just a supplement and isn't just a sleep thing in our body or a sleep hormone.

It is a vitally important mitochondrial hormone that is pretty much the most important mitochondrial antioxidant and not only acts as a direct antioxidant of the mitochondrial level but also acts to recharge the internal what's called the A.

R. E. Antioxidant response element which is these powerful internal antioxidant and detoxification enzymes like glutathione and cattle A's and super oxide disputes. So every night while we sleep that needs to be getting recharged and that depends on adequate levels of this hormone called melatonin.

And we also know that just being in just to kind of give you a sense of the magnitude here Just being in standard indoor home lighting suppresses melatonin levels by upwards of 50-70%.

So this is not a small, I'm not talking about you know these inputs that just have 5, 10, impact on hormone. I'm talking about your melatonin literally depends almost entirely on having the right light inputs and not having certain other light and puts into that system and therefore your mitochondrial health and whether you're accumulating mitochondrial damage or you're repairing mitochondria and your quality control processes are keeping an adequate pool of healthy mitochondria.

And the recharging of that internal antioxidant and detoxification system which we depend on to be resilient to all of our exposures to viruses and environmental toxicants and every other source of stress, all of that depends on a healthy circadian rhythm and sleep so we can start to see hopefully I've done a good job of painting a picture of kind of the spider web of all these interconnections of of how our physiology works and how it affects mitochondrial health and energy production.

– You know that was actually beautiful because what I was afraid of and you did is so many of my patients have gone to sleep, you know, sleep centers and you know they they give them they give them tips but they mostly give them some kind of draconian suggestions.

And what you just painted was a picture that gives people a just a fuller understanding of how important sleep is and what you can do about it and just an idea of how our everyday environment is messing it up and that's what we're blind to.

You know, literally just just just blind to the effects of of our indoor lighting and the disaster of led lighting. This is another another another example of how what scares people when we try to fix things.

It does it does save money on your monthly energy bill. The problem is you're just gonna pay for it later on with your your medical bills. – Yeah. – So and just you did mention melatonin and like we'll talk in depth more about nutrients and things.

But what what are your thoughts on when people use melatonin? I mean the overuse under use just I know that's probably a big subject for you I would imagine.

– Yeah it's interesting I was reading a book by a physician I think his name is Frank Shallenberger actually like to have him on my podcast but I haven't yet. – He's an excellent a man who I've learned a lot about ozone therapy from. So Frank is a good resource.

– Yeah, he's got a lot of interesting ideas and I think it's very smart in a in a number of ways in his book, he talks about melatonin and he recommends I'm in a space on the exact number here but a massive dose of melatonin I think 100 mg I want to say it could be like someone for because some of the cancer doctors use 40 60 mg, 100 that I've seen a lot of those studies but I remember when I read Dr. Shallenberger is work his book bursting with energy recently.

Even having seen a lot of the studies that you just referenced in the sort of 40 to 80 to 100 mg range, I recommend being shocked at the dosage. He was prescribing and it was he was saying just universal like basically everybody should be taking this dosage.

On the other hand you have, let's say someone like Andrew Huberman who's out there widely telling people to avoid melatonin supplementation. So you know the spectrum couldn't be more broad. You know you've got experts who are saying everything from use a dose that is, I don't know what the math is.

500 times greater than the physiological dose to someone saying, Hey, there's consequences when you use this melatonin all the time. It's not just you don't get a free pass, this is a hormone it has physiological effects.

You can't just dump in orders of magnitude higher amounts than our body produces and expect no side effects to happen. There's, there's a few things that I have to say on this. So first of all, there's a lot of positive research on melatonin a lot of positive research for all kinds of things, neural protective, obviously mitochondrial protective has strong anti cancer effects.

There's research in treating various cancers and treating gut disorders and treating neurological diseases, many, many other things. And uh there's a lot of research that shows very positive effects. Okay, so just by virtue of that, I can't really express a lot of negativity around it.

Now, having said that I'm in an interesting position because I seem to be personally in a category of people which is not well talked about in the literature and I can find almost nothing on but people who seem to be hypersensitive to exogenous melatonin and melatonin, if I take the typical sort of dose that's on the market, three mg dose of melatonin, I have insomnia, I can't sleep very well at all.

It really disturbs my sleep and it makes me extremely groggy the next morning, sometimes horrifically groggy. I mean I've I've woken up after dousing myself with melatonin the night before, woken up so dizzy and horribly fatigue, feeling like I'm gonna vomit, can barely stand up and move from a three millimeter milligram dose and I'm not somebody that's particularly sensitive to supplements.

I'm most most commonly can't feel anything from most of them. But melatonin affects me and interestingly my father is the same way with melatonin. Now my mother can take a 10 mg dose, she sleeps well, has no ill effect and I think most people are in that category. But from doing some surveys on this, I found, I think somewhere between 10 to 20% of people are more like me.

Now I found a sweet spot of exogenous melatonin of somewhere between 0.12 point three or 30.5 mg. This is other words, in other words, 100 to 500 micrograms rather than the typical thing that you see on the market like three or five or 10 mg.

Red light, water, and mitochondrial function

So it's a much smaller dose for me if I use 100 to 300 micrograms, I find that it generally enhances my sleep and I have no ill effects. Just by virtue of kind of my naturalistic evolutionarily evolutionary lens that I tend to look at health from, I have a wariness of anybody recommending using dosages that are orders of magnitude higher than the normal physiological dose in our body. Okay, so I would I would advise people to, and the physiological dose by the way is 300 micrograms micrograms.

So that's 0.3 mg. So I would urge people to sort of play with that range rather than jump to the typical 35 10 mg dosages unless you have a particular medical condition that's been studied with these higher dosages in which case have at it. And then the final thing I'll say here is more recently thanks to a discovery by melatonin researcher Russell writer who has done a lot of research. I mean decades of research on melatonin, it's been recently discovered that red and near infrared light which I happen to have written a book on um has it turns out that it boosts melatonin production at the mitochondrial level. Okay. And this is an interesting twist to the story because the idea has always been melatonin is produced by the pineal gland in our brain and then it sort of goes systemic. And in response to you know blue light exposure, melatonin suppressed when blue light exposure goes down.

Then we secrete this melatonin from from our brain. But it's been recently shown and for example in studies in animals where they remove the pineal gland entirely. So there is no penal sourced melatonin and yet they look at cellular melatonin levels and they find that they have the same melatonin levels inside of the cells as mice with pineal glands. Right?

And what this tells you is that there is another source of melatonin? Well it turns out mitochondria have evolved over millions and millions and millions of years.

Two make their own melatonin. So I told you this part of the story before that melatonin is this critically important mitochondrial targeted antioxidant.

Well, it's so vital for mitochondria mitochondria evolved the ability to produce it themselves and they do so primarily in response to light input. So we do this in primarily in response to read and you're in for a light exposure which we get from the sun, we also get to some degree from firelight.

But of course the natural source historically was sunlight primarily. And now we have as I've written a book about red and your infrared light therapy lights which can also boost melatonin levels at the mitochondrial level.

So anyway that's sort of the big picture of my thoughts. You asked a seemingly small question on melatonin but it turns out there's a lot to say between talking about the melatonin produced in our brain exogenous supplementary melatonin and the melatonin produced by mitochondria at the cellular level – And this was a great example of of why we're actually doing this series is what people have to understand is medicine is a story. Okay, medicine is not engineering.

I say this all the time. We do not have the equations to know what's happening in the body. And it's the physiologic response. I mean just to start off with just the fact that for I don't know 40 fifties however long we've known about melatonin, it's come from the pineal gland and you know as we get older and calcified and that's why we need more melatonin. You know older people.

In fact what you're telling us is a good chance that we need more melatonin because we have less mitochondria if we've been aging like we've been H. E. But it's just you know – And I would add we also have a deficiency in sunlight exposure and red and near infrared light exposure that we're not synthesizing enough of this mitochondrial protective melatonin.

And at the at the mitochondrial level. – Absolutely. And the and just the question of dozing, I mean this goes back to I mean just one of my things that should be an axiom in any time people are listening to their doctor, especially any doctor but especially the those of us who are doing things let's say based on our best intuition and and like you say the best knowledge that's out there, okay and you know so I've always felt that I start with 0.32 point five micro milligrams or 300 micrograms of melatonin.

But I often as I find that for younger people that often is the dose as people get older, they often need more higher and higher doses and with like with infection, if you have acute infection melatonin, you know 10 mg of melatonin for a week or two for anybody except the people like you, because I do have the reason I start so slow because the nature of my practice I see tend to find the more sensitive human beings who give me a skewed view of nature actually because I think I sometimes I think people are too sensitive or more sensitive than the vast majority are, but there are enough people like you who too much and perhaps it has something to do with serotonin since you know like maybe it backs up our serotonin levels or something because that's a melatonin being a downstream product, you know, who knows, that's why it activates some people.

And it gives you that next day hangover, interesting thoughts for for research here – And I completely agree with everything you said about, you know, younger versus older people in in acute context of respiratory infections.

– Yeah. You know, and it's but I just the important message here is again, the other important and the other thing I was gonna talk about how you think it's the evolutionary biology perspective because as I said medicine is story, okay, that's all it is. It's a good story sometimes but it's not, we don't have the A. B. CS written out for us.

We don't have the rule book. You know? And the best rule book we can look back on is evolution. And when you have a molecule like melatonin that has been conserved for a billion years it's probably really important. So your your your concern about very high doses I think is warranted. It just if it's appropriate use it but I wouldn't make it a blanket statement. Dr. Huberman who I like I think sometimes people missing hormones are not equal. Okay there are some hormones that you can suppress easily with exogenous hormones and there's some that you don't seem to have such a big effect when you use exogenous hormones and and the same thing with biochemical with chemicals and supplements.

Unfortunately we're just learning which is which but I don't think you should make blanket statements that taking exogenous stuff is going to suppress what you're making.

– Right. And actually this is kind of interesting. I think we still need to learn more on this to really understand what's going on here. But there it's actually been studied the degree of um suppression of endogenous internal production of melatonin that we get when we use external melatonin supplements.

Gut health, fiber, and resistant starch

And what that research has shown to your point is that it tends not to suppress internal production of melatonin. I've even seen some melatonin researchers like Doris low make the argument that taking external melatonin increases internal production of melatonin further. Having said that in in terms of subjective experience, what I have found is that people who take melatonin for periods of time, whether it's three mg, 5, 10, whatever, and then they, if they take it for several weeks or months or years and then they try to go off of it, they sleep poorly and they sleep horrifically bad usually for a few nights and then it starts to normalize again without melatonin, which is really exactly what you would expect if there was some kind of suppression happening. So the research says there's no suppression happening. The anecdotal reports of people who take it to me suggest there's maybe it's not actual suppression, but there's some kind of maybe it's a receptor mediated mechanism or something that is causing is disrupting the normal feedback loop. And then when you take the melatonin away it does disrupt. – I wouldn't be surprised if it is a receptor issue. And that's but the good part is to see what we have to be careful about, I think, and I want to waste too much of our time talking about this because I'm interested, but is that the model of adrenal suppression.

When you take high doses of exogenous hormones has kind of color the picture for researchers and steroids and testosterone to exactly the same thing. There are there are there There are organs that actually atrophy, there are

other organs such as the thyroid that just quiet down.

But when you stop the example, I've seen people beyond thyroid hormone for 40 years and when they stop it there's they're fine. You know? So it's not all organs are not created equal right again.

But I think that the basic basic point that I think you made is don't try to screw around too much with mother nature. – Exactly. I think that that has as a general guiding principle. I think that's smart – But you know, melatonin can be helpful especially as as you know people or when you're sick and you just can't sleep. And so and the red light aspect you know I've I've used it as a way to you know increase mitochondrial energy in specific areas of the body. But you're finding it.

And I remember did you we're gonna we're gonna do a little Eric A. D. D. Moment. I apologize here. But I think did you interview Jerry Pollack any chance I interviewed him recently?

– Maybe a couple maybe six weeks ago or something – Because that just makes me light, light and energy in the body. I just is is something that I think is so important and I mean you've already talked about it but if you hadn't wanted to throw in something from Dr. Pollack's worldview because I think it's quite interesting.

– Yeah I agree completely. And this is I wrote about it in my book actually is one of the mechanisms it's a more speculative mechanism because his work is not yet sort of fully accepted and embraced within the whole of I would say physiology researchers researchers within the medical community.

But I think it's almost a certainty that his research has validity and his ideas around this fourth phase of water and how this enhances cellular function and physiology.

The gist of it is that if I can try to explain it very briefly light input particularly from infrared radiation. Red near infrared and far infrared. But the thing with far infrared is that it doesn't penetrate very deeply into the body.

Like and really most light sources don't penetrate deeply into the body. Blue light UV light, green light. They all stop very much at the surface. Far infrared is heat also stops very much at the surface.

Contrary to the claims of a lot of makers of infrared saunas that are claiming it penetrates very deeply in the body. It's actually not true. Red and near infrared light do penetrate deeply in the body.

That's why when you see kids playing with a flashlight at night and they shine it through their hand or through their fingertip. The light that comes out the other side is mostly red in color. And it's because that's the wavelength of light that penetrates through near infrared is also penetrating through to a large degree.

But it's invisible to the human eyes. We don't see that unless we've got night vision glasses on. So this energy from red and near infrared sources of radiation and far infrared sources of radiation is affecting the viscosity of water near the cell membranes. And this allows for certain ion gradients to be maintained properly inside and outside the cell. The concentration of things like sodium and chloride and potassium and calcium and things like that.

And the pumps that work to maintain those ion gradients to allow them to work more efficiently without requiring so much energy. And it allows for the water and our vessels to and the blood vessels to move more efficiently.

And it allows the electron transport chain and the A. T. P. Synthesis pump in the mitochondria to produce energy more efficiently. So, you know, there's there's a few layers by which this sort of what's called easy water exclusion zone water allows for again somewhat speculatively allows for human physiology to function better in mitochondria to function better.

– Well, I love Dr. Pollack's work and I you know, I really think he's on the right track and it's gonna be very hard to get the rest of the physiology world to look at it because you know, when you go from electrical energy to physiology, you lose 90% of them right off the bat.

But but just I wanna there's so much I want to talk to you about and I realized I don't have that much time. So I wanted just practical things for people.

As far as what have you found to either help the gut and help energy production as far as healthier gut and maybe more useful mitochondrial function. What kind of foods?

I mean something that something that you know you spent a lot of time thinking about what what's your top top thoughts on foods and supplements if you would like.

But especially the foods. – Yeah the gut is an interesting topic and a tricky one. So I'll mention just a couple of ways the gut interfaces with energy levels and mitochondrial function.

Number one, if you've got intestinal permeability and you've got leaky gut then what's happening is you've got undigested food particles leaking directly from your gut into your bloodstream, creating an immune and inflammatory response.

That inflammatory and immune response is itself a danger signal to mitochondria causing mitochondrial energy production to slow down. In addition when you have intestinal permeability you're going to have the leakage of some of these bacteria and what are called endo toxins or lipo policy Sacha ride which is a toxin from gram negative bacteria leaking directly into your bloodstream.

And the that endo toxin. This LPS is also directly Mitsotakis sick, it is toxic to mitochondria and it will damage mitochondria will it will be sensed as a danger signal that also turns down energy production a third layer to the story of kind of the the gut mitochondria access is the production of short chain fatty acids like appropriate literate.

Beauty rate in particular is has as a number of important roles in maintaining colonic health, in fighting intestinal permeability, maintaining the integrity of the gut barrier. It has very strongly neuro protective functions.

In fact status karate in Dr. Datis Kharrazian who you probably know he in an interview that I did with him recently he lists this as his number one most important brain compound and you can supplement with it. But it's meant to be produced in large quantities from our gut if we have a healthy gut and the might and the right microbes that are present there. So that beauty also interfaces with the mitochondria where it greatly enhances mitochondrial energy production.

So this beauty rate molecule produced by microbes in the gut in response to consuming various kinds of fibers. So we want a diverse array of fiber in our diet to facilitate not only the production of the literate but to feed the colony of bacterial species that produces these short chain fatty acids that have these gut protective neuro protective mitochondrial protective mitochondrial enhancing roles.

That's that's one layer is we want to have things like a diverse array of different plant fibers. We want also plenty of resistant starch in our diet as well. And also – Just give them, give our audience a little resistant starch. – Yeah, there's a few food sources of this.

It's found in small quantities and a lot of foods, it's found in large quantities in certain foods like regular potatoes, like rice and particularly if you cool the potatoes and the rice. Other sources, certain kinds of nuts and lagoons and things like that will have certain grains will have resistance starch in them as well. But diversity of plant foods you can supplement with potato starch, you can supplement with tiger nuts is another good source of resistance starch. They're actually, tiger nuts is actually technically a lagoon, but they call them tiger nuts.

And I'm sure I'm leaving out some stuff here, but that, that's kind of the general gist of it. If you cook potatoes and rice in your diet and you allow them to cool, like you put them in the refrigerator, then you eat them the following day in a cool state, you're getting lots of resistant starch.

Oh, green bananas is also another green banana flour is another way that people supplement with them or eating green bananas. Not the most pleasant thing, but it will give you lots of resistant starch.

And then the last thing that I'll mention here as far as far as how the gut interfaces with mitochondria is, there are certain phytochemicals that we consume that get metabolized by microbes in the gut and turned into other compounds.

So I mentioned Mitofsky earlier and as far as this quality control process of mitochondria, cleaning up the damaged and dysfunctional mitochondria. Well, the most powerful compound that promotes Mitya Fiji is called your old within a Euro within a is produced by microbes in our gut in response to consuming certain phytochemicals, especially what are called elegant tannins or alagic acid, which is found in small amounts in many different berries found most abundantly in pomegranates and chestnuts.

And so basically we take in this alagic acid, These microbes in our gut converted to Euro Euro litany, which gets into our system, which then facilitates and amplifies that.

The cleanup quality control process in our mitochondria. So we have multiple ways which gut health is interfacing with mitochondrial health. The complex part of this, you know, I said at the beginning of my answer here that that gut health is complex.

The complex part is that when someone has poor gut health, which is pretty common these days, people can often react negatively to a wide diversity of plant fibers in their diet and to things like resistant starch.

And so then it becomes further complicated because then you've got people out there concluding, oh, these things are bad for me, They these negative reactions, I shouldn't consume these foods. Then you've got certain dietary gurus who are kind of capitalizing on this convincing people that these plant foods are out to kill them and and that they should avoid these plant foods and things like that.

And so there's a bit of a mess out there, a number of levels when it comes to talking about gut health. But in an ideal world, we'd have healthy gut integrity. We'd have a healthy microbiome and we would have a diet that is rich in a diversity of different plant fibers and resistant starches and phytochemicals.

– You know, you brought up, I mean, just put a few points in here.

Dietary caution, microbiome, and closing advice

one is that again, is that people once they, once you get ill, your gut is often inflamed, especially after covid since, you know, the guts probably we don't talk about it much, but it's the place that Covid probably hits, you know, after the lungs probably the most um might be the place it hides.

So what I want people to remember is that these things are not 0 to 100. You know, they're not black and white. The beauty of the body is that we can have organs that are having trouble, but they're not dead. You know, So there's a lot of resilience in our systems. I mean, no matter how disturbed your gut is, there's always hope for it. As long as we're still breathing, we can do things and but it's as you said, we have to be careful not to make the mistake of foods that make us stick when we're not well don't assume they're bad for you.

It would be like having a broken leg and saying I'm never gonna walk again, – Right? You know, every time you try to put pressure on your broken leg it hurts you you go screw this leg.

I'm never using this thing again. – No. And I have seen people literally have their I mean just just total osteoporosis from a restricted diet over a long period of time. You know, I just I just beg people, I mean like do not go this hurts me, this hurts me, this hurts me. And soon they're down to like three or four foods, you're not serving yourself. You know, – Not only that, but when you do this it becomes a vicious cycle because then when you do that kind of diet for a long period of time and then you try to reintroduce, let's say you adopt a diet that's very low in plant fibers.

And then you try to reintroduce them after a period of time. Some types of plant foods and you'll find that you're very reactive to it. And and there's a couple of reasons why is that, You don't have the proper bacteria to digest those fibers very well. And so they're sort of being improperly digested producing a lot of gas and bloating. And

because the body becomes you develop what's called visceral hypersensitivity where you become hyper reactive to these internal sensations of gas production and things like that and you start to feel them more as pain whereas you shouldn't be feeling them as pain.

And um and then it becomes a vicious cycle in the sense that many people will then conclude these things are bad for me. I need to get rid of them for an even longer period of time and then become more and more sensitive to them in the process and develop more and more visceral hypersensitivity. – Yeah well said and it's a it's just how do I say it's one of the dilemmas of our modern world because so many people have such restricted diets to begin with before they get sick and they just don't realize it.

You know the modern American diet is so limited in its vegetable content and that you're already in trouble. – Yeah it's I want to add one more layer to this maybe to have a bigger impact on people. One thing that's interesting that I think maybe many people are not aware of is we all have our unique microbiome individual to us and it is passed down from our ancestors literally your family and your ancestors carry a particular set of of bacteria that that's that's unique it's like we all have a unique fingerprint we all have a unique microbiome that we're carrying through the generations. Well when we do things like take antibiotics and when we do these extreme diets we run the risk of literally making many of these bacteria go extinct where we no longer are passing on those bacterial species to our Children. So it's becomes the end of this thousands and thousands of years of our ancestral lineage carrying this unique microbiome.

And with modern antibiotics and our X craze for extreme diets we can potentially be breaking that chain of passing that microbiome on. – We have to we have to end. But I I'd like to do it on a more uplifting note.

But I think the uplifting note for me is just you know eat as much real food as you can. It sounds so simple and it's so boring it's like getting sleep boring. You know we all have reasons why we're too busy or why we're too sick. But it is crucial to regaining your health.

You know and I really urge you to you know get Ari's book and book. I mean and really this is the stuff it's you know you can spend you can come see me and spend lots of money on all kinds of fine tuning and detoxing but if you're not doing what Ari is telling you to do rarely is that helpful? You know again we can do what we were talking about Band aid medicine. We can cover symptoms up we can get you feeling better. And some people feeling better.

That can get them back into the battle. Because I always say that's where medicine started. Where battle battlefield medicine is. What's is how medicine has grown over the years. You know, give us a war and we learn a lot. But it's not you don't want to go back wounded into life if you want to go back healthy, you have to restore your normal natural rhythms and you have to learn how to live in the world that used to be because our current world is toxic and I just I was going to end on good news.

But the bad the bad news is I mean I've been doing this a long time and people are the people who are getting sick are sicker than they ever were. And I used to I did geriatrics in the 80s and I took care of lots and lots of old people and they were healthier than a lot of my young people are now.

And it wasn't because they were health. You know, they weren't health conscious. You know, they didn't have a choice. They didn't have the choices. They didn't grow up on these terrible foods anyway and they didn't have all the E. M. F. S. And God knows what else we have but but going forward, you know, getting over a cold long covid and chronic fatigue and any chronic inflammatory illness is about rebalancing your, your systems, your energy letting your mitochondria get a little more signals of safety.

Because safety is what is, what is what the body is always looking for. You know, we can deal with little signals of danger. But when that danger signal is incessant, you're gonna stay ill.

So any any uplifting thoughts. – Yeah, just follow up on what you were saying there just to maybe you know, we've had a really beautiful, meandering conversation through a lot of different topics.

I've really enjoyed having this conversation with you. But maybe to just kind of bundle everything up and tie it up in

a nice, neat little package. I would, I would encourage people to understand their fatigue symptoms, their long covid symptoms as fundamentally a result of two things. This too many sources of these danger signals from a variety of different sources. And it's not just covid, covid is the straw that broke the camel's back. And as you said earlier, you probably had some pre existing toxicity. I would add, you probably had some pre existing mitochondrial atrophy where your mitochondria shrank and shriveled over many, many years or decades.

And you don't have the robustness of that my mitochondrial network. The piece of this story that I didn't explain earlier is how big that cellular engine is, how many mitochondria we have in ourselves and how big and strong, there is not just um something that relates to how much energy we can produce.

It is very much directly. It is central to how resilient we are in the face of stressors, how much of insults and stressors and attacks on the system we can handle and then recover and return to health quickly.

And so if we have atrophy of those mitochondria, we are going to be much more susceptible to stressors overwhelming the system and then keeping us locked in a cell danger mode, keeping us locked in chronic fatigue mode. So the goal here to tie everything up that we've been talking about, reduce the danger signals that your mitochondria are sensing and also focus on building back up the resilience of that mitochondrial network.

– Yes and be good to each other. Be excellent to each other at least try to be loving as best as you can because that's the other secret to that. Slow quieting down that fear signal. Feel it and love it.

And I just want to thank you Ari I mean it's been a pleasure to chat with you and you're right, we won one day we'll have a conversation that's a little more directed.

But it was a pleasure. – It was an absolute pleasure. Eric Thank you so much for having me