Switch Off the Cell Danger Response
Guest: Niki Gratrix, BA

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Dr. Davidson: Hello, this is Dr. Jay Davidson from DrJayDavidson.com. Thank you for joining me on The Mitochondrial Summit. My guest is Niki Gratrix and we're exploring how to switch off the cell danger response by stimulating the vagus nerve.

But before we do, a little bit about Niki. Niki is an award-winning nutritional therapist, functional medicine practitioner, and transformation coach helping people to optimize energy. In 2005, she co-founded one of the largest mind/body clinics in integrative medicine in the U.K. The results with patients at the clinic were published as a preliminary study in 2012 in the British medical journal *Open*.

In August of 2015, she hosted the largest ever free online health summit on overcoming fatigue interviewing 29 world-leading experts on optimizing energy with over 30,000 attendees. So amazing. Since 2015, she's spoken on over 40 large online health summits reaching over a million people worldwide. Love it! Niki, welcome to The Mitochondrial Summit!

Niki: Thank you so much for having me, Jay. It's a super exciting and important topic so very good.

Dr. Davidson: Yes, I'm super excited to hear the cell danger response. Maybe we can dive right in there. First on defining that, what is the cell danger response or CDR?

Niki: Well, it's really important, especially as it relates to mitochondria because most people do have some understanding of the mitochondria are the engines, the power plant of the cell. And most people have that understanding. It produces something called ATP, which is the energy currency of the body, if you like.

But what recent research is showing—and this is the work of Dr. Robert Naviaux, who is a hero of mine and a major researcher in the area. He's really the one who's popularized the term, "cell danger response." We've learned that the mitochondria don't just do this energy production role. They have a major role in cell defense.

So when under threat, the mitochondria switch from being a power plant into a battleship, if you like, with major health implications. So when we talk about the cell danger response, it's very much centered around the function of mitochondria. And in response to a threat, the mitochondria switch from normal functioning into specialized functioning to fight off whatever the threat may be.

And I use an analogy of London, London City during The Blitz, during the Second World War. So during The Blitz and the Second World War, basically the whole city was in lockdown. And there's all kinds of changes that take place that include things like rationing energy. And some of the things that are happening are exactly the same things that are happening at the cell level.

So some of the changes that we see in London during The Blitz, for example, so you have rationed food. Everybody starts to live down in the tubes like the London Underground Tubes. And we would make sure that the enemy, if you like, didn't get our resources. So this is what happens at the cell level.

So the cell danger response involves things like less production of ATP, partly so that the energy, which might be a bug or a virus, can't access that and use it against us. Okay. Things like the cell membranes were thickened in the cell danger response for two things: keeping the energy out, but also providing the defense mechanism so we stop bugs coming in.

And all kinds of things where essentially that the huge thing happening is that we have less energy. And that's why in most chronic complex illnesses, one of the most stated symptoms in medical records is fatigue. And when we have mitochondrial dysfunction, this post-exertional fatigue, fatigue is very much the cause in all symptoms of mitochondrial dysfunction.

So these are the changes that we see. It's all part of self-protection, but it obviously has major implications, especially for illnesses like chronic fatigue

syndrome where we've done a lot of research in the area that it's related to post-exertional fatigue.

And that is literally the cell, through protection, shutting things down and turning from a power plant into a battleship, essentially, with all the side effects and the things that we would experience with chronic complex illness, essentially.

But what's very important about the cell danger response, as well, is that it may have been triggered by something. It can be triggered by the usual suspects. It can be by a physical stress, a psychological stress, chemicals, bugs, viruses, electrical or electromagnetic stress.

But the key thing is when we get stuck there, so when the cell danger response gets stuck in defense mode, rather than normal energy production mode, this is where the onset of chronic complex illness really starts, and proliferates and continues and is perpetuated.

So one of the things we can think about when we talk about the cell danger response, it suggests to us that ask not what caused your illness, because often the triggers are well gone, but ask what is still blocking you from healing? So quite often, something that triggered the cell danger response like a chemical, is now cleared out.

But it's when we get stuck, when the mitochondria are still stuck in this cell danger response, and for various reasons, the healing stop taking place. And that's when symptoms become chronic. So we want to unblock the healing process. And we could talk more about that in the context, also, of how this links maybe to the vagus nerve, as well.

Dr. Davidson: That is awesome! It's such a great description. So I'm immediately thinking, based on your cell danger response of energy factory to switching to battleship, a good example is if somebody gets a, "flu," they usually get very tired. And it's like, "Get your rest." Is that essentially because the mitochondria's switched from ATP production to, boom, cell danger response, and energy production is essentially shut down, and now we've went into more of the immune system mode?

Niki: Exactly that. So the resources that were originally for energy production get siphoned to antiviral, antibacterial, and inflammatory responses. We've only got so much resources in the body. And literally, those resources that were just there when we're generally healthy, and we're not under stress, and we're safe, and there's no bugs around, then we can fully express in that way, as soon as there is a bug there or there's some kind of trigger, the resources

are siphoned into literally the nutrients, the molecules are switched away from ATP into things like an antiviral pathway. Exactly that. And that's why we get incredibly tired when…Well, it's one of the reasons why people get very tired when they have the flu, as you say.

Dr. Davidson: That makes sense. And then if somebody has a chronic infection, bacterial, viral, parasitic, or something, that could then put them chronically into this state, which is probably why it's so common to have fatigue and energy issues when you have chronic illness?

Niki: Exactly that. So this is, it's really profound. This is based on an area of systems biology, which is why, essentially, everything's connected to everything. So when you have poor mitochondrial function, that affects every other organ because you have mitochondria in practically every single cell. So you're going to be more likely to have things like leaky gut. When the cell danger response becomes chronic, things like leaky gut, liver detoxification issues, these kinds of things slowing down…

And so it's all a knock on effect. And everything affects everything. So, yes, it's very much a systems approach. And it's very interesting when you're considering it from more of the metabolic health, rather than the old conventional medicine model, which is just one bug, kill the bug, and then you're healed. That's not how modern health and disease really works in the modern age in the types of illnesses that we see that are so common today.

Dr. Davidson: It makes a lot of sense. So where does the vagus nerve fit in? Because in my schooling, we were taught the vagus nerve is known as the wandering nerve that goes to every single organ in the body. So how does this fit in with the mitochondria and the cell danger response?

Niki: Well, what's really fascinating, this is so interesting, is that the stages of the cell danger response appear to be matched by equivalent changes in the vagus nerve expression. So there's the work of an eminent psychiatrist called Dr. Stephen Porges who helps a lot of psychology practitioners and helps people with the understanding of the impact of trauma. And so just bear with me because I'll connect this in.

So it turns out most people realize we have the fight/flight response where we have the sympathetic side of the autonomic nervous system that gets triggered by a stressor, fear, and it can be any kind of threat like a bug again, or a chemical. So we can have this fight/flight response, which is the sympathetic side of the autonomic nervous system.

The other side is the parasympathetic vagal nerve side, which is the rest, digest, detoxify side. And so we all think the vagus nerve, we want to stimulate the vagus nerve because that's the rest, digest, detox, or our healing side. But it turns out the vagus nerve actually has two sides to it, as well. This is Porges' theory that Dr. Robert Na has tied into the cell danger response.

The two sides of the vagus nerve is the ventral and the dorsal. So what we see in trauma is we don't just see people who've had trauma in a fight/flight response all the time. There's also freeze response. Now if you speak to trauma specialists, they'll say, "There's this freeze response. My clients aren't in fight-or-fight. They're in a collapse mode. Almost like a hibernation like shut down like playing dead, exactly like playing dead.

And what Porges did was said, "This is actually the dorsal part of the vagus nerve, which kicks in." Just like when we see animals playing dead, it's a response to threat again. Okay. So the response to threat is either fight/flight. But if we can't do that, we collapse and we play dead. So it's almost like there's a hierarchy of responses. If we can't fight, we can't fly away, we can't run away, so we play dead. And that's the dorsal side of the vagus nerve.

And amazing, what Naviaux actually has done is connected in and said, "This seems to be reflected in the cell danger response, as well. There's a stage in the cell danger response where there's a stress response, but then it's also possible for the cell danger response to create a type of hibernation response. And it's reflecting what's happening in the vagus nerve.

So essentially, everything's connected. And what's happening at the cell level is happening at the nervous system level. And I'm just going to use the example of chronic fatigue because that's the area where we have post-exertional fatigue. That is an idea where the mitochondria have gone into what we call a dauer response, which is they've gone into hibernation as a defense mode for playing dead.

And usually, you can correlate that with a vagus nerve that is docilly stimulated in a free state. So the point being, we now have the understanding about how psychology plays into mitochondrial function. Essentially, when we think about the stress response, we now have a much bigger picture of understanding stress isn't just about a cortisol response, it's reflected at the vagus nerve level. And that gets translated, it's the cellular level.

So the stress response is now a vagus nerve which wants you to go into fight/flight or it might go into the collapse mode. And then it's just mirrored by what's happening in the mitochondria, as well. So the mitochondria's listening to the vagus nerve.

Now when we talk about the vagus nerve, it's connecting into the brain and it's the communication between the brain and the cells. So the upshots of all this—so what does that mean for people? —is that when you stimulate the ventral part of the vagus nerve, it tells the cell's danger response, "Everything's okay, you can heal now. It's a fundamental part of healing.

And it's the part that gets switched off when the cell danger response is in full whack, the vagal tone is down and there's a low heart rate variability, which is the test of vagal tone. And so that's when the whole system is either in freeze or stress mode and basically, you're in chronic illness and you don't have energy, and so on.

So one of the key things, how do we reverse the cell danger response? Because of this connection with the vagus nerve, there's a few different things we can do. One is we'll talk about what are the practical ways you can simulate the ventral side of the vagus nerve? We want to shut off the fight/flight response and get out of the dorsal side, which is the collapse side. And we want the ventral side.

The ventral part of the vagus nerve is where we feel good. We feel happy. We feel socially connected. We feel uplifted. We're in a state of well-being. And that literally will get reflected at the cellular level. So the mitochondria's like listening. It's amazing thing to consider. So that's part of it. There's a couple of other things, as well.

Sleep is medicine, circadian rhythm management is medicine, and exercise and the correct pacing, and obviously food, this is all medicine for the cell danger response for the mitochondria to help it reset itself and reprogram itself back into normality. I hope that made sense? It's a little bit of a complex area, but.

Dr. Davidson: Yeah, just see if I'm connecting the dots properly. So if somebody has, let's say they have a chronic stressor, a chronic infection, that their mitochondria switches from ATP production to the battleship lock down immune system mode, then does that then switch the vagus nerve into the dorsal part, which is essential that playing dead, collapsation, hibernation type mode? So you're saying that the mitochondria then dictates what happens with the vagus nerve in switching that off? And then those work in synergy where you stay stuck in that mode?

Niki: It's probably bi-directional, the relationship between the vagus nerve. See everything affects everything. And it's a bi-directional relationship. So definitely mitochondria speaking to the vagus nerve and the vagus nerve is

also speaking to the mitochondria. And the thing that's particularly interesting about the vagus nerve, there's been some stunning research papers done on what happens when you stimulate the vagus nerves?

And there's been experiments where they, they actually did an electrical implant and stimulated the vagus nerve in people with extreme, very severe autoimmune. It was arthritis. The patient was cured in eight weeks. Completely back to normal just with a vagus nerve stimulator. Then they replicated that with an external, not implanted, not a surgical procedure just an external electrical stimulating device. And they've cured fibromyalgia, they've cured depression with this stimulation, vagus nerve stimulation.

And FDA approval for vagus nerve stimulation are a whole range of issues now, whether it's epilepsy, lots of different major chronic complex illnesses like that. So that's how I got interested in this work because I was seeing these amazing results from stimulating the vagus nerve. And I didn't realize how that is directly connected with the CDR and mitochondria, as well, and how you're switching off the cell danger response and helping that healing process so that the mitochondria normalizes again.

And the good news is there's tons of ways to stimulate the vagus nerves that is not using a device. And I know we're going to get questions. There's isn't a specific device on the market yet that I would personally recommend that has been tested enough and clinically validated, but they're coming out some of the very expensive. The more clinical data there is behind it, the more expensive, in the thousands. But you'll see more and more of these devices coming out in the marketplace.

But the good news is anything that raises heart rate variability, that increases vagal tone. So this is where it just reinforces how important it is for some of these lifestyle aspects that you can stimulate your vagus nerve every day by having a lifestyle that includes things like meditation, loving, kindness meditation, positive social relations. Exercise if you do it, definitely raises heart rate variability and stimulates the vagus nerve. There're about 40 different things—qigong, yoga, a little bit of fasting does it, as well, so do green vegetable juices, and beets, not too many for the sugar side.

But anything that raises heart rate variability, we need to send these messages to the brain. We need the brain to get the message that it's safe now. That you feel safe. That's the key takeaway. When we feel safe, and calm, and okay, and whatever that may be that we need to create that emotional state, the vagus nerve is the communicator between the brain and what's going on at the cell level.

So this also explains why psychological trauma, early life stress, yeah, especially early childhood stress, the communication is the brain via the vagus nerve and then it's speaking to the mitochondria. And then you get it, it's bi-directional. And you have these knock on effects. So this is why the quality of our social relations, our psychological state is so very important. And that these states need to be cultivated.

So if we don't cultivate joy, if we don't cultivate meditation time, if we don't cultivate things that raise vagal tone on a daily basis, that's all going to prolong…It's a core part of the healing is that we do those things that stimulate the vagus nerve. And by the way, the vagus nerve, when you stimulate it, it switches off inflammation. The vagus nerve is in charge of doing that.

And what they found is that's why they were able to cure the arthritis client, for example, where they just gave the electrical stimulator. But it turns out, the vagus nerve tells the immune cells, "It's fine, we don't need you to keep creating all this inflammation. Like calm down." But when the communication gets blocked and the vagus nerve isn't being heard, because it's in dorsal state, the information's crazy. So we want to cultivate, not only for healing, but also prevention of daily processes.

And I get my clients to, first thing in the morning, to have like maybe three or four things they do. Gratitude journaling is a great thing. Essential oils increase heart rate variability. Like use everything, sunlight, time in nature, water therapy, these are all nice things to do. But we need to be even more aware about these are practical things that don't cost very much. And they are resetting the nervous system. And that also just helps you beware if you have unresolved trauma that's keeping you in a state of stress.
If you have PTSD, you get the help you need to resolve that because when you don't, your mitochondria are in a stress mode. And it's called the cell danger response. And they are responding to that, as well. Your cells are listening. And the vagus nerve is the communication between the brain and the cell. So we have a much bigger picture now of what we mean by stress response. Right? That makes sense?

Dr. Davidson: Wow! Yeah, it connects so many dots.

Niki: It does.

Dr. Davidson: It simply just makes sense. So do you believe the future then is that there's going to be more of these "maybe some type of stimulator devices that can then trigger that…" Is it the dorsal side of the vagus nerve that's good?

Niki: It's the ventral we want.

Dr. Davidson: Ventral, ventral. Ventral's the good. Dorsal is the hibernation side.

Niki: Yes--

Dr. Davidson: Okay.

Niki: That's exactly right. And there will be more devices due to come out. There's one they're trying to get FDA approval from, it was actually Dr. Norman Doidge talked about it. I think it's called the PONS device. And it's having amazing results with various people who are pretty severely ill. And it's either his first or his second book, Dr. Norman Doidge, who's the brilliant neuroscientist researcher.

And, yeah, they were reversing MS with that. So they literally switch off the inflammation. And it's a device where you actually place a plate on the tongue. And the tongue is stimulating vagus nerve. And that is actually how it works.

Dr. Davidson: Interesting.

Niki: Yes, it's very interesting. But it's putting the fire out in the brain. It's calming both sides of the brain so you get in to a healing state. And then that literally does get translated. It switches off the information. And then see everything is connected in the body. You just can't isolate one area. But I think the beauty of this work is it's the first time with Dr. Robert Naviaux work where he brought in Stephen Porges, he's a psychiatrist who works with the psychology side, into with the mitochondria work. And it's like, "Wow!"

So that's true systems biology. It's truly a holistic approach. But we now understand how that works. People have known that things like meditation, obviously, changes the epigenetics for the good side, but people didn't know that it actually is directly speaking to the mitochondria, as well. And people didn't realize the mitochondria have this role to play, which is way beyond just energy production and that it, also, can create the defense response, as well. But we could, also, if we have time can talk about a few of the other practical things people can do to get out of the cell danger response, as well.

Dr. Davidson: Yeah, yeah. First, just for clarification, so we've got sympathetic versus parasympathetic. Sympathetic, the fight or flight, I'm going to either run from the bear or fight the bear. Parasympathetic often gets like you said

the rest, digest, like typically, that's why we want to sit down, calm our body down before we eat so we can get in the parasympathetic mode.

But you said, essentially, it goes deeper, that the parasympathetic splits off. And it's not just being parasympathetic, but it's actually being ventral portion of the parasympathetic that you want to stimulate. And is that ventral then side, that's more keyed in with the rest, digest, and healing more than the dorsal?

Niki: Yes, so Stephen Porges' theory, it's actually called Polyvagal Theory meaning we all thought the vagus nerve is like one thing. No, it's poly. It's two things, the ventral and the dorsal side. And it literally is different. Like one of the parts that the ventral side, I believe is myelinated. The dorsal side is not. They start in different areas. And they end in different areas. They almost really are two most different nerves.

Dr. Davidson: Wow!

Niki: Yes, and that's Porges' work. And it helped all of us psychology practitioners understand how somebody, they're traumatized, but they're not in fight/flight. They're not in sympathetic. Oh, they are in parasympathetic, but they're in the wrong side. They're in the collapsed side, which is the dorsal side, which is the play dead mode, which then switches everything else off. And then the vagus nerve isn't doing its anti-inflammatory job or all the other things that it does that makes us feel good.

And I know that's quite a lot for people to take on, to know about. But, yes, Polyvagal Theory, that's all it means is there's two sides to the vagus nerve. And the ventral side is the good side, thus we ought to stimulate that. When there's high vagal tone, that means we're in rest, digest, detoxify, healing state.

I think it explains people who are in depression, as well. So someone is traumatized and they've gone into depression mode, they're not in fight/flight. You look at the statistics and you look at the autonomic nervous system, they're not overstimulated on the sympathetic side. They're actually in collapse mode.

And it was Porges who came along and said, "I think that's because they're actually in the dorsal dominant state of the parasympathetic side. So it's an important clarification which has now been applied to the cell danger response, as well, which is Naviaux being ahead of his time there, I think.

Dr. Davidson: Yeah, I love that. So what are some other things that you would recommend for the listener here as we wrap the interview up, Niki, on just their brilliance? I not only love your accent, you have such a great heart and spirit. And I just love listening to you. And obviously, you're just so knowledgeable. So I'm really enjoying this.

Niki: Well, thank you, thank you, I hope it's useful to people. That's the main thing. Yes, so what are some other things that are really foundational that people can practically do to help support the mitochondria switch back into normal energy production?

So some really key things is the circadian rhythm management and the quality of sleep, it's so important. Getting the rhythm back so that the cell actually…It's at night when we sleep when this process of autophagy takes place, which is essentially where the body cleans up dead proteins, and old proteins, and cleans them up, chucks them out, and make sure that we're living off healthy proteins.

When we block autophagy, you're living off yesterday's proteins. So we need sleep to help the CDR response, to help it switch back, and reprogram itself, and rebuild cells, healthy cells again that aren't damaged, that aren't out of what. So sleep's really important.

And here's some tips to really help people get really good sleep. I think people may have heard of it or maybe not, but there's certain practical things that you can do to help this. So one thing is when it gets dark, make sure that you're switching all your…Ideally, you have all your bulbs, your lightbulbs to to orange. If people in your family don't like that, get your blue-blocking light glasses going. You can buy them for ten bucks at Amazon right. Wear them when dusks start.

I've had people who had insomnia that cured their insomnia just with blue-blocking glasses. They were looking at their iPads, and iPhones, and all the rest of it, which is all blue light. That blue light literally goes into the brain. It's speaking to the hypothalamus, which is then saying, "Oh, it's daylight." No, we want to start retraining the brain to say, "No, we need to calm down. It's going into nighttime." So we want to block the blue when it gets dark.

So use your blue-blocking glasses. But timing of food is critical to this. Ideally, try to not eat about three hours before bed time. So as soon as you eat food too late, too close before bed, the body is looking at that and taking it as a single of, "Oh, it must be daytime because we're still processing food." It's basically temperature, activity, light, and…There's four of them. I'll think of

the fourth one in a minute. Light, temperature, activity, and food timing, that's the four. Okay.

So three hours before bed, avoid eating. Light, first thing in the morning, get bright sunlight. So that's telling the brain to switch everything on. And literally, when the hypothalamus gets that message, it's actually going through the optic nerves in the eye. And its real thought that there's another nerve that takes this light information and works on the circadian rhythm.

And we have clock genes. So our hormones switch on in response to these light signals, these temperature signals. So literally, if we don't get that like get it nailed, if you like, so bright sunlight first thing in the morning, first 30 minutes on waking up.

If you don't live in a sunny climate, you can get these SAD lamps from Amazon that's pretty affordable. Ten thousand lux is about right. And you can literally just be doing other things, but shine it about six inches away. The light is coming into the eyes. You're getting the message. It's like a shot of caffeine without doing the caffeine. It's great. And you can micro dose it through the day, as well.

Do your activity earlier in the morning. Get outside and get as much sunlight as you can. Don't wear the blue-blocking glasses during the day. I'm hearing people who are getting these glasses and they're saying, "Oh, my prescription glasses are all blue-blocking." I'm like, "No, we want the blue light during the day. That's important. It's antidepressant, its mood lifting, it's the right message. It's only at night when we switch off you want complete darkness during the night.

And I know this is different for different people, but I say to people try and go to bed towards…If you are trying to recover from an illness, get into bed earlier towards like nine to nine-thirty. Some people are going to have a little bit of a different biological clock slightly, but most of us, it'll do you really well to go to bed earlier, nine to nine-thirty. And if you're worried about, "Oh, I'm going to lose productivity because I work until midnight," is really bad if you're doing that. You'll be more productive in the morning by going to bed earlier.

So I think that's about five or six things that manage circadian rhythm. But remember the body, everything's connected, everything's speaking to each other, everything's monitoring what's happening. Your mitochondria's watching. So we want to maximize your sleep. Sleep is the restorative time. The brain cleans out the toxins when we sleep, the lymphatic cells. Like the cells of the brain opens up. The debris' cleaned out at night, but only do it

when you have good sleep. So sleep is absolutely fundamental to help reverse cell danger response.

I've mentioned activity. Temperature should be cooler at night, warmer during the day, as well. So we want to make sure that the bedroom is completely dark and that we're cool. So in terms of activity, just the pacing side. I think this is more important for people on the bit of the post exertional fatigue side of things. Pacing's really important.

So if you are in boom and bust, like you're doing so much work activity, whether that could be emotional or physical and you're in the boom and bust, meaning you push yourself and then you collapse, that is prolonging the mitochondrial dysfunction. So the pacing's important.

Some people don't really have that issue, specifically. But if you do have the kind of post exertional fatigue piece, pacing is a fundamental requirement. And if you are constantly overdoing it, you will be doing damage at the mitochondrial level if you're overdoing it and don't do nothing, either because then you've got…

It's a balance. There's a sweet spot. There's a sweet spot. Don't do too much, but don't do nothing, either, because we actually need a bit of hormesis. We need a bit of stressor to keep the mitochondria functioning and adapting to increased demands. Just like when we do weight training, the mitochondria adjust. The same. You need to give them a bit of stress. It's only when we give too much. And then it prolongs it. So there's a sweet spot. So get your activities in balance, as well. And there's no external prescription. It's listening to your own body.

So if my body is going in to stress and I'm going into post-exertional fatigue after an amount of activity, that's your signal it was too much. And if you're pacing good, you're doing plenty of activity, and you're not getting post-exertional fatigue, every now and again bounce the boundary. Do a little bit more and you go, "Oh, I can do this now. I can do a little bit more." And then you edge up and you start doing more.

So I'm always careful about exercise when we're speaking about it to people who may have some kind of illness going on because, although exercise is great and it's one of these major factors, obviously, in the healing state of a mitochondrial dysfunction, you got to play it a little more careful.

Dr. Davidson: Totally, awesome. I'm also thinking about what you said that if you eat late at night, then it's triggering your body that it's daytime. That maybe if you are jumping time zones that maybe intermittent fasting in earlier

in the day is not good, that if you're skipping time zones or what not, and that's all off, you actually want to eat earlier to then trigger that it is daylight, potentially. Have you thought about that with the different time zones?

Niki: Yes. So there's things you can do to really speed up re-regulating the body into the local time zone. So I would get into as much as you can. If you're wide awake, but it's dark outside, don't turn all of the white lights on and all the blue lights on. So it really makes a difference, as well, to connect directly to the earth barefoot in the local time zone. So there's definitely an electromagnetic process going on there when your feet is directly connected to the earth.

So yes, I do all of those things that…If you think about temperature, light, your activity levels, and the food timing, and connecting to the earth in your local time zone, you speed up how quickly your body suddenly goes, "Oh, we've changed time zones." And you'll climatize much more quickly. Yes, people don't realize you can actually hardly have any jet lag if you do that and quickly adapt. So yeah, it's good to know when it comes to the circadian rhythm. If you know about that, you can actually overcome jetlag.

Dr. Davidson: Awesome! You're just so knowledgeable. I want to thank you for coming on the summit and dropping your knowledge bombs. It's going to help so much for the listener to help connect the dots of…Because we've known that a lot of these things are beneficial, but to understand at another level, I think is just going to help us so much.

Niki: I hope so. Yeah, it's a bit of a complex area of systems biology. But it's so valuable. It's an amazing, new, expanded awareness that we have with this connection between the nervous system, and what's going on at the cell level, and what's going on psychologically, as well. So it's all connected. And the good news is it's reversible if you know what the right things to do. So it's good.

Dr. Davidson: There is hope. Well, thank you for listening to The Mitochondrial Summit. Make sure to share this interview with your friends and family and also consider adding this summit to your library by clicking the order button. And don't forget to visit Niki Gratrix at NikiGratrix.com. Maximum blessings. This is Dr. Jay Davidson.