Fasting, Autophagy, Mitochondrial Biogenesis and Deep Cellular Healing Transcript

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Podcast Intro and Guest Welcome

And regular exercise. Good sleep. Things that we're talking about, intermittent fasting, actually all trigger something called mitochondrial biogenesis, meaning the formation of new healthy stress, resilient mitochondria and autophagy in particular.

Like when we're intermittent fasting and exercise, we're also stimulating something called mito ag. My top ag is when we break down old damaged, what we call senescent or aged mitochondria.

So in order to form a new healthy mitochondria, we got to get rid of we need space in the cell. We got to get rid of the old not functioning or the damaged mitochondria.

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Personal Health Journey and Biohacking

I'm Doctor Isaac Jones and this episode is part of our exclusive series recorded at the Exponential Longevity Summit, a global gathering of cutting edge health experts exploring the edge of human performance, healthspan and longevity.

Let's get into it. Doctor joggers, I'm so excited to have this interview with you, my friend. Thank you so much for, being, here for us. You are one of the top longevity experts in the space, and we're so excited to get into this topic with you today.

You just so happen to be also one of my best friends, and I'm going to your house to work out on Friday, so that's. Absolutely. Exciting. And, and, and honestly, David and I, we talk about this stuff anyways.

So you guys are going to be in on a, on a kind of secret conversation that we have in the gym when we're working out so. That, yeah, Sara is our normal conversation.

We hang out regularly and, get our families together. And so just, you know, been doing, doing life with Isaac Doctor Isaac Jones here now for over 20 years and, yeah, you know, excited about, everything that you're doing.

Thank you. I'm so excited about what you're up to as well. And, you know, you're doing some amazing things. Doctor. Joggers. You've got one of the top natural health podcasts out there.

You've got one of the top natural health websites on the, on the web. And you've really become an expert in fasting, in autophagy and understanding autophagy, as well as mitochondrial biogenesis, as well as how to really, like, create deep cellular healing, which is what we're going to talk about, today.

And so, you know, you this is a kind of a funny story I'll share just at the beginning in that David, he was doing this stuff in school without even knowing, like I was his roommate in school.

We're going through a doctorate program together, and we are roommates and literally, he was doing some of this stuff in school without even knowing. And now we know the science, right?

But you just you figured it out by, I guess you could call it biohacking yourself, but, do you want to share anything about that before we die? Yeah, yeah.

For sure. Well, I kind of had to figure it out because I had irritable bowel syndrome when I was in my early 20s and I was a personal trainer. I was eating, you know, 6000 calories a day, huge meal before I went to bed, big protein shake in the morning or whatever it was that I was eating.

Lots of, you know, ultra processed foods that I thought were healthy. And actually I was living a healthier lifestyle in people around me. But it all caught up.

It just overwhelmed my system and I was not able to. I started losing weight. I was not able to maintain my muscle mass and I had to make lifestyle, you know, nutrition changes, lifestyle changes.

And, you know, somebody had turned me on to Doctor Mercola and his book, The No Grain Diet. And so I started taking out grains when I'm more of like, you know, we called it back then the Healing Diet, right?

Yeah. Yeah, yeah. And so, you know, now, you know, then then it took on a term like the paleo diet and things like that. And it was a lower carb diet, higher protein diet.

And I just felt more satiated. And I would say, you know, God really blessed me with kind of having a just a talent of being intuitive with what my body needs.

Right? Like, I have this intelligence of being intuitive. Okay. I feel like my body needs to fast right now where I feel like my body needs more protein right now.

I need to exercise and get out and move.

Autophagy, Insulin, and Fasting Basics

I need more nature and just kind of having this level of intelligence, of kind of taking inventory of where what am I feeling in my body and what do I feel like can help improve my physiological state.

And, you know, that's really what we do with biohacking. And that translates right into optimal performance and longevity. Yeah. Absolutely. Yeah. And so, you know, you've you've really delved into this topic of autophagy.

I'd love for, the, the listener to understand what is it. Why is it so important for healing and longevity. For sure. Well, just like the seasons, you know, just like we have spring and fall, summer and winter, you know, body has different seasons.

It needs to be in and kind of, you know, in a sense a circadian clock, you know, just like we sleep at night, you know, typically we should be at least that's healthy lifestyle principles.

And then we should be awake and alert during the day. The body should be going through cleansing periods and building periods, periods where we are, in a sense, building muscle building, lean body mass and periods where we are breaking down older damage proteins and older damaged structures, and then and then basically recycling the, the, the, raw materials and rebuilding.

And so we should be going through a building and a cleansing cycle on a regular basis. And the main factors involved with telling the body, signaling to the body whether we are in a building phase or a cleansing phase, really

are hormones.

In particular, the main hormone is called insulin. And anybody that's familiar with diet, diabetes, you know, we hear about insulin. Insulin resistance is a really big factor in our society.

And insulin is a superhero hormone. Its job is to take sugar or glucose out of the bloodstream and put it into the cells, where it can be used for energy.

When we have high blood sugar, like somebody that has insulin resistance and they're not able, their insulin is kind of like it's a carrier. And it's it's almost like a key opening the the door on the cell to get the glucose in.

When somebody is insulin resistance, the key is no longer working. So now glucose elevates in the bloodstream. And also insulin elevates because we are trying to to pound that door open.

And so when that happens the elevated blood sugar ends up. These, these sugar molecules will bind to proteins in the bloodstream and create something called advanced glycation end products or Aids.

And these advanced glycation end products are like shrapnel going through our bloodstream. So they destroy the endothelial lining in the blood vessels.

They damage our kidneys, they damage our nerves. So you think about somebody with uncontrolled diabetes. They you know, they don't die from the diabetes.

They die from all the complications of these aids. They develop peripheral neuropathy, congestive heart failure, kidney failure. They're on dialysis. They lose their vision.

They get optic neuritis. That's because these AGS are just destroying the different systems of their body. So insulin protects us from that. And again, Insulin's job is to get the glucose into the cell.

The issue is as long as insulin is elevated above a certain threshold, right. We're always going to have some level of insulin. As long as you know we don't have full destruction of our pancreas, we don't have some insulin in the blood.

But once it jumps up above a certain threshold, it tells the body, okay, you need to store fat and burn sugar for fuel and stop, recycling, stop autophagy. Autophagy.

Is this cleansing cycle, right? Or we're breaking down old damaged proteins and recycling them. Very important. Insulin stops and insulin inhibits autophagy.

And insulin also triggers another pathway called mTOR mammalian target of rapamycin, which is a protein signaling pathway that has to do with building. Right.

So again, mTOR and insulin have to do with building dividing cells, cell reproduction, building lean body tissue. They're important for building muscle building bone.

So those are good things. But when they're chronically elevated, then we lose out on autophagy cleansing, rebuilding, recycling damaged proteins. And so we need to cycle back and forth between building and cleansing.

In our society, though, we're eating a lot of ultra processed foods. We have, you know, we have access to food all the time, like our ancestors didn't.

They didn't have pantries, refrigerators. So they depended on a good harvest or a good hunt. And when they harvested well and they hunted well, they feasted.

That boosted insulin and mTOR. But when they didn't, which was which was regular on a regular basis, they they

wouldn't have access to food or and that that's right.

They would go through that cleansing phase. They would trigger more autophagy, break down old damaged proteins, elevate human growth hormone which gives them which helps preserve lean body tissue and gives them very good anti-aging characteristics, helps improve mitochondrial health, which, you know, we'll come back to.

So our ancestors naturally went through these cycles in our society. I mean, you and I, if I just walk into my pantry, I mean, I could live off of my pantry for the next month, right?

We have unlimited access to food. We have to be intentional. We have to actually think, okay, I'm going to not eat. So that way out my body can go through this cleansing cycle.

So we have to be intentional about that was our ancestors. It was just a natural part of life. Well, then how is it that we should be integrating this into our life?

Like, what are the best strategies to kind of stimulate the natural autophagy like process? In our in our own bodies for sure. Well, there's a number of things that trigger autophagy.

But the number one trigger is basically when our body senses it needs more energy, it needs more, you know, it's not getting enough fuel in a sense. Right.

And so when we bring insulin down so things that bring insulin down are going to be fasting, right? A lower carbohydrate higher protein diet. Okay. We talked about, you know, the healing diet. Right.

So it's tends to be a lower carbohydrate diet, real food diet. We take out the ultra processed foods. All these are an ultra processed foods. You know when you go to the store and you're you're looking at crackers, potato chips, these things are made in such a way that they trigger high amounts of insulin, right?

They feel good. Right. And from a survival, our our our blueprint, our genetic blueprint desires these kinds of foods because they're going to keep us alive if we're in a famine.

And humans have gone through more famines than we have periods of extended feasting, right? So now our humanity is in a period of extended feasting, right?

And this is why we have such an issue with, people being overweight and obese. Right? We have obesity. And yet you're looking, you know, that that's spreading from like it's a big issue.

China. Yeah. Definitely. But you go back 150 years ago and it was only like kings and really, really wealthy. It was a very small percentage of people that were overweight.

I mean, even like like in, you know, countries, third world countries, like, like, like, for example, North Korea, it's only the, you know, the government elite, right?

Everybody is like super thin, famished. Right? They're not they're malnourished. And then it's only the elite that are overweight, right. Because they have unlimited access to food. So.

Right. You know, when our society we are we are just being in an extended period of feasting. And so this is a problem because we're constantly eating these ultra processed foods.

So we obviously need to cut out the ultra processed foods. We need to start with good nutrition, whole food, real, real food based nutrition. I'm not against all processed foods.

For example, olive oil is a processed food, right? Right. It's not highly in slow genic okay. And so that's fine. That's a good you know, if it's coming from a real food source.

And it's broken down in such a way that actually you can enhance bio bioavailability of the nutrients, I think that's a good thing. But we want to avoid, you know, when I say ultra processed foods, you know, you go through the middle sections of your store, you'll see them.

All right. Oh crackers, cookies, cereals. Right. All that kind of stuff. So that's one of the first big steps. And then just reducing the amount of times that we're eating during the day.

Right. The average adult, unless you're a high level athlete, you don't need to eat more than three times a day. Yeah, right.

Meal Timing, Protein, and Exercise

Unless you are really, you know, lifting up, you know, working out for two hours a day, you know, you're in the NBA, you're in the NFL. Something along those lines.

I understand you might need more, but for the average adult, 2 to 3 meals a day is great. Okay. And if you focus on protein and high protein when you're consuming your your your food, I always recommend 30 to 50g or more in some cases of protein in a meal and then healthy fats on top of that.

Usually your healthy fats are going to come with your protein in most cases. Just on that. Like what does that look like, 30 to 40g of protein? Like let's just say a breakfast with eggs.

You know, an egg I think has seven grams of protein, right? So that looks like maybe 3 or 4 eggs, right. Or more. Or more. Yeah, exactly. So with eggs, you also have a lot of healthy fats in there too, right?

So to get 30g with eggs yeah. You're looking at usually 4 to 5 eggs. Right. And so for some people that depending on. What's that that for men and women would you say.

Yeah. And so if you're under let's say you're 125 pounds or so, you're probably fine with 25g of protein, 20 to 25g if you're a little bit on the smaller side.

But, you know, for you're 150 pounds or more, then you should definitely be looking to get 30g. Now for breakfast. You don't have to get it just from eggs, because eggs are also high in healthy fats, which is good.

But some people don't do as well with the fats. So usually I'll tell people aim for 15 to 30g of healthy fats in a meal, depending on how well you digest fats.

For some people, their, bile ducts in their liver and gallbladder are congested. Or maybe they don't have a gallbladder, so they're not a as much bile, so they need to tone it down a little bit on the fat.

So what they might do is something like, fat free Greek yogurt or organic Greek yogurt, which is high protein. Okay. Or maybe even a protein shake where they get like some unsweetened filled, lighter coconut milk, right?

That you get a carton, recent protein powder. We used to tell them what we put in our our shake. Yeah, definitely. We could do that. And then so you might have the eggs on the, on the side.

Right. 2 or 3 eggs and then have a little extra protein. Or you could do, you know turkey bacon right. Which is tends to be very low in fat and higher in protein.

So you kind of want to figure out what your fat ratio is. You know, I used to just tell people, just get this amount of protein and not worry about the fat.

But then there were a number of people that were like, whenever I do that, I just don't feel good, right? Like I feel nauseous now is because they couldn't handle the fat.

It wasn't the protein that was causing the problems. It tended to be the fat. And when we reduced the fat content, they felt a lot better. And then I always recommend getting a lot of colorful fruits and vegetables.

Right. So get colors in your in your diet. I think that's always key. And when you do that, when you get your protein right, you feel more satiated between meals and then you're able to go longer periods of time without food.

So if you do 2 to 3 meals, you stop the snacking, throughout the day, and then you're able to kind of condense or, you know, basically get your meals, in, in something like a 6 to 8 hour eating window, right?

Or maybe, maybe ten hours, right, depending on the person. And so on, depending on your schedule, that means you're able to fast for, let's say, 14 hours overnight.

So if you finish your dinner at 6 p.m. or 7 p.m., you should be able to fast until 8:09 a.m. the next morning without any issues. And when you wake up in the morning, instead of going right to food, start hydrating your body.

We're all dehydrated when we first wake up, so getting some good, getting some good hydration in early will not only hydrate your body and improve your energy levels, and your brain function in the morning, give you more wakefulness.

But also on top of that, it actually, helps to fill your stomach, which suppresses your hunger hormone, ghrelin. Right? When your stomach's empty, ghrelin gets released signals to your hypothalamus that you're hungry.

So with the water will stretch. The stomach receptors inhibit ghrelin. You'll feel satiated. You'll feel a lot better. You'll be able to go longer without eating food.

So allow for natural hunger to arise before you need to eat and fuel your body. And I think that's key. And that will give give your body time to undergo that cleansing process, that autophagy process.

And then if you're able to couple that with exercise, exercise is the second biggest driver. So we talked about fasting or time. You know, another another term for fasting is time restricted feeding where we're, condensing our eating window.

So we're eating in, let's say, a 6 to 10 hour eating window. That's intermittent fasting or time restricted feeding. The second biggest driver is exercise.

So getting good quality exercise, it could just be going out for a walk every day, which is great. And ideally coupling that with something that really gets your heart rate up.

Now for some individuals, going out for a walk is enough for them, especially if you're older, an older individual that, hasn't been training for a while.

Maybe you're dealing with a chronic inflammatory condition. Walking might be exactly what you need. Yeah. But, you know, for the office. Yeah, yeah. What we're doing right now, backwards on my treadmill.

I love it. Yep. And so. But you can also couple that. And I recommend getting resistance training in. So as you start walking, if you're not able to do it yet, start walking every single day.

And then that will help reduce inflammation. We know that movement in general actually releases mild kinds, which are these hormone, these, these immune cells and these hormone like immune cells that come out of your muscles that suppress or reduce inflammation in your body.

And so that will help reduce inflammation alone. And then, that should also get your body, your fitness level up to where now you can start doing resistance training.

So doing resistance training where you're strengthening your upper body and your lower body, I recommend doing

3 to 4 days a week, and then alternating between upper body and lower body.

So one day you do upper body, the next day you do lower body while your upper body rests. And that's the best way to do it. And that strength training is critical for longevity.

You really want to build muscle for longevity. We know sarcopenia, or muscle loss, is one of the biggest risk factors for early mortality. And meaning you die early.

And so if you are fasting but not doing any sort of strength training, you're actually you're going to be losing the muscle mass. I mean, even if you're not fasting, if you're, you know, if you're you could eat as much as you want, if you're not doing the strength training, it's going to lead to sarcopenia at some point in your life.

And so you really need to be doing resistance training. And that works really well with fasting. Believe it or not, as long as you're refueling with the protein afterwards.

That's very interesting, because one thing I've noticed about you is you've gained muscle mass since we were in school, like you probably put on, I don't know, 10 or 20 pounds of muscle.

And, and it's because you've, you've, you've integrated a lot of these learnings into your own life. And you know, you use your particular schedule around exercises that you strength train.

Was it every other day or pretty much every day? Yeah. So for me, I well it depends on the season of life. Right. So back when I, when my wife and I, I used to work out six, seven days a week all the time when I was younger.

And then we had twin boys and we weren't able to sleep at night. Right. Or sleep was sleep became restricted. And so, you know, if you're not recovering well, you you should do less high intensity exercise.

So during that season I cut it back to 3 or 4 days a week. But you know, I'm at a season now where I'm sleeping really well. And so I'm back to I strength train six days a week.

Really because I enjoy it. I think you can get great results in 3 to 4 days a week. I thoroughly enjoy it. And for my brain, for my mental health, it's one of the best outlets for me.

Like, I just feel like when I'm strength training six days a week, when I'm able to do that, just mentally my mood, I'm so much more in control of my my temperament, my mood.

I feel like I'm a better father, husband, friend. You know better at everything. I'm better businessman, better at everything in my life. And so for me, it's something I, you know, I wouldn't say I enjoy the pain of strength training, but I enjoy the results.

Right. And the, you know, the endorphins that are released are amazing for mental health. And most people don't realize this, right. But strength training is a great way to boost testosterone.

And for men, typically we think about testosterone, we think about big muscles and libido. Right. But I think the stats are on the biggest impact Sjöström has is healthy brain.

Right. Healthy mood. Good, good mood. As long as you're optimizing your testosterone, you're not overdoing it. Like, like people were taking anabolic steroids.

Yeah. You know, but it's really important for mood, for creativity, mental health, optimal performance in general. So for me, that's why I do. That's what I do.

Mitochondrial Health and Sleep

But, you know, I think I don't think you need to strength training that much. I think 3 to 4 days a week, I think you

can get phenomenal results and your rest and recovery is just as important as your training.

So you really want to maximize recovery to. Know I love that that's so good. And how does all of this impact the mitochondria. Right. Like and the and in the gut microbiome like because these are two things that that are very kind of interesting to discuss.

Yeah. Yeah huge. So mitochondria are the cell are within all the cells or organelles. Just like we have organs in our body. Like our heart is an organ within all the cells of our body.

We have mitochondria and they are what produce the energy in all the cells of the body. And they're also there in a sense that are like the brain and the nervous system of the cell.

They're actually changing their energy output based on the environmental conditions and regular exercise, good sleep, things we're talking about, intermittent fasting actually all trigger something called mitochondrial biogenesis, meaning the formation of new, healthy stress, resilient mitochondria and autophagy in particular.

Like when we're intermittent fasting and exercise, we're also stimulating something called my top AG, my top ag is when we break down old damaged, what we call senescent or aged mitochondria.

So in order to form a new healthy mitochondria, we got to get rid of we need space in the cell. We got to get rid of the old not function of the damaged mitochondria.

They're not functioning well. A damaged mitochondria is not able to burn fat effectively for fuel. It is an obligate anaerobic, meaning that it can only burn glucose and it can't use oxygen to produce energy.

Okay, something else is like that in our body as well. Cancer cells. Right. And so we build up enough of these senescent damaged mitochondria, dramatically increase your risk of developing cancer in your body.

And it's we're really with cancer as a deformed cell, that has not been able to undergo autophagy or apoptosis, whereas programed cell death. Right. And so we got to get rid of these bad mitochondria.

And we want to form new healthy mitochondria. And ultimately the quality of our life is going to come down to the amount of high functioning, stress resilient mitochondria in our body. Wow.

And so we want to do everything we can to get rid of the bad mitochondria. Right. The you know, these bad mitochondria called cause zombie cells right.

These old damaged cells that are just kind of sputtering around, taking up space, demanding resources, but not really offering us any good function and.

Even showing the other cells to become zombie cells. That's right. Yeah, they're they're you got you got. Exactly. So they're influencing, just like a, you know, just like, you know, why your kids to be around bad influences.

Right. You know, you want to remove them from, you know, those kind of environments. Well, it's kind of the same thing. You don't want your healthy cells being around zombie cells because they can also be influenced to become zombie cells.

Yeah. So fasting number one trigger to get rid of these zombie cells. Number two is exercise. Okay. Now fasting and exercise are not going to be effective though if you're not sleeping right.

So if you're sleeping three four hours a night, if you're, you know, if you have insomnia, if, you know, your sleep cycle is all over the place, you're not really getting up, getting quality sleep.

You have sleep apnea, you're not going to get the same results as somebody who's sleeping well. Okay. So it's really important. I always say, you know, gotta dial in that sleep first, right?

Like that's I mean, obviously you can make a new nutrition changes. I think that's key. Getting off ultra processed foods is going to help you sleep better, but you gotta do everything you can to get good quality sleep on a regular basis.

And somebody who has a lot of stress resilient mitochondria, they can handle one bad night of sleep right? Like if something happens, you're traveling, whatever it is, you have bad night's sleep.

You should be resilient enough to be able to handle that and be okay. Right? But if you're getting consistent bad sleep, bad sleep, bad sleep, yeah, that is going to catch up with you.

And so you really gotta dial in the sleep and then the exercise, the, the intermittent fasting. Now you're going to get the results, right. When you're doing that and you're going to feel so much better and you're going to develop those stress resilient mitochondria.

Now my touch is key. It's key to to to to fast to get good. Sleep's for my autophagy which is getting rid of those senescent mitochondrial organelles in the cells.

And and, and obviously eating healthy food. Well, we'll support with that as well. Yeah. Super important and one of the reasons why sleep is so key is because your body produces a lot of melatonin.

Melatonin is an endogenous antioxidant. So not only is it a hormone your body produces to help with sleep, but it's also endogenous, meaning your body produces it and it will slip into the mitochondria.

So most antioxidants that you take, they don't get into the mitochondria of the cells. But melatonin naturally slips into the double membrane of the mitochondria, and it helps to reduce oxidative stress in your mitochondria.

And so oxidative stress is like rusting. So we talked about all these senescent mitochondria. And the reason why we get them is because of this oxidative stress component.

So the better we sleep the more melatonin we're able to produce. Also infrared. So being getting out in sun actually will help boost, even though it seems counterintuitive, will actually help boost mitochondrial melatonin production infrared in general.

So if you can't get in the sun, get an infrared sauna or like a red infrared light box, and that will also help help boost mitochondrial melatonin, which helps protect the mitochondria so they last longer.

They don't oxidize as quickly, right. It will help repair mitochondria that, you know, maybe are in the early stages of damage. And so again, it's all about preserving and optimizing these stress resilient mitochondria as much as possible.

So sleep is super critical there. And that's going to help you get the results with fasting and exercise. Wow. Touching base. What what are your top three tips for real quick on sleep before you touch base on gut microbiome?

Yeah, because I want to get to the microbiome. But yes for sleep. Couple things. Number one is really make sure, you know, we have a darkness epidemic in our society, meaning our darkness deficiency epidemic, I should say.

Yeah. So our ancestors had a lot of darkness. So when the sun went down, they may have been exposed to fire, which is like an orange light. That orange light does not suppress melatonin, whereas blue light, like, I've got lights on while I'm doing this interview, these blue lights and also like midday sun, a lot of blue light that suppresses melatonin, which is fine.

You know, at one right now it's 4:00 in the afternoon. We're doing the interview totally fine to be exposed to blue light, but when the sun goes down, I need to make sure that I am I am reducing all exposure to blue light so you can get blue light blocking glasses. Dim your lights in your house.

All of that super key. I recommend getting at least ten hours of, time without blue light every single night, so that doesn't mean you have to sleep for ten hours if you if you feel like you need to. That's great.

For a lot of people during their initial healing process from chronic inflammatory conditions, they need nine ten hours of sleep. But I don't I don't need that much sleep.

But I do need the darkness. And so getting so at, you know, 830 at night, I'm usually I usually have blue light blocking glasses on. I've dimmed all the lights in my house.

Okay. And then I'm usually going to bed at 1030 and I'm waking up at like 630. So from 830 to 630 I'm not being exposed to blue light, right? I've got my blue light blocking glasses, which even if I have a screen like a if there's TV on or whatever it is, it's changing that blue light into that orange light like I'm being exposed to fire.

So that's super key. Get ten hours of darkness. Okay? Again, doesn't mean you have to be in a pitch black room. Can just be the blue light blocking glasses, dim lights.

You can change your light bulbs to, you know, the, the orange, orange ish kind of light. You can candlelight, lots of things like that. So that's key.

Keep your room cool. Best sleeping temperature 65 to 68 degrees. So a fan or air conditioning or whatever it is. You know, nowadays they have, you know, all different types of things.

They've got sheets, or sheet covers, mattress covers, things like that, that, you know, the bed jet. There's, you know, all different types of things that will help to, change the environment you're sleeping in to get that right.

Temperature for really, really good sleep. And I wear an eye mask at night. Even though the room's dark, I find that I just sleep a lot better with an eye mask on, blocking out any sort of ambient light that could be coming in.

So I think those are a couple big keys there for for good sleep. Amazing, amazing. And so yes, please do share about the mitochondria and how that. Yeah. Or sort of the gut microbiome. Yeah. Gut microbiome.

So I'll just go into fasting on the gut microbiome is a lot of research. Also an exercise that's really exciting and how it impacts the gut microbiome.

But fasting most people you know most microbiome researchers, you know, they'll they'll tell you, hey, in order to have a healthy microbiome, you need to have a very diverse microbiome, meaning you need a lot of different species of microbes, lots of diversity, multiple different species.

Gut Microbiome and Intermittent Fasting

And when you lose that diversity, your overall metabolic health and inflammatory levels, are, are are reduced. Right. So like you're not you're more inflamed and you have less metabolic health, worse metabolic health.

And so in order to improve the diversity, they'll tell you, eat, you know, a whole lot of prebiotic foods, right. And that is one way to improve diversity is eat a wide range, like a lot of a lot of people will say, go to the grocery store and get new things right, like one week you might do artichokes, parsley, cilantro, arugula and onions, right.

And the next week you might do, you know, and along with fruit in the next week you might do, you know, asparagus, celery. Right. Like a whole all different types of vegetables because each one of those has unique prebiotic prebiotic, compounds in it that can support, different bacteria and create diversity.

And that is one approach, but that honestly does not work for everybody. Okay. The reason why is in our society, we have a lot of people with bacterial overgrowth in their system.

And they have there's when we look at the gut, there are primary feeders and secondary feeders in the

microbiome. So in in our gut we have in our small intestine we have one small one cell wall of small intestine all the way across held in by tight junctions.

And that's because our body is God designed us to optimize absorption, because, again, our society, we've been exposed to famine, periods of famine a lot more than feasting.

So when food comes in, we need to maximize absorption. So that's why we only have that one cell. Now above that cell, that cell lining we have mucosa right.

It's called the gastro associated lymphoid tissue. It's where 80% of our immune system is. So we need to really have a good gastric mucosa there to help protect the intestines and help basically kill off bad stuff.

That's that's in our system. And keep the microbiome in check. So the primary feeders live right above the mucosa. So right on top of the mucosa. The secondary feeders live inside of the mucosa.

And they can actually eat the mucus okay. And one of them one type of secondary feeder has been called the keystone bacteria in the gut. And it's called Aquaman's mucin. Ofelia.

That's a big, big word, right? But mucin ofelia means mucus loving. So it actually loves to eat the mucus. Okay, so with our gut, if we're constantly eating eating every few hours, like most people in our society are, we actually overfeed the primary feeders?

We overfeed the primary feeders, it crowds out the secondary feeders, and we don't get enough of the secondary feeders. We actually don't produce healthy mucosa because even though the Ackerman's got eat some mucosa, it actually stimulates a goblet cells in the intestines to produce more healthy my, mucosa.

And it also will release compounds like the secondary feeders, like Acker manja when it eats polyphenols. Right. Coming from, you know, the different foods that we're eating olive oil, dark chocolate, pomegranate, you know, all these different things.

Our polyphenols, fruit, fruits and vegetables basically. It really it creates something called your olefins. These your olefins stimulate intestinal cell.

My autophagy. Now going back to that idea of mitochondria health right. We have we get it actually they actually create healthier, stronger more stress resilient mitochondria in the intestines.

But they need to be fed. Well and the only way we feed them well is by actually, killing in a sense, reducing the primary feeders. Right, by reducing the primary feeders, kind of like weeding your garden, right?

Or weeding your lawn when you pull the weeds out. Not only does it make a lawn look better, but it actually provides and allows for more nutrients in the soil to get to the healthy grass or the healthy garden.

Like if you're trying to grow tomatoes, you got to pull those weeds out. So now the nutrients get into the tomatoes and the onions and the things that you want to grow, you know, for example, here is like in my house, in my front yard, I've got an apple tree and I've got a blueberry bush.

And every year we've got to trim back the apple tree because it will it the branches grow quickly and it will crowd out the sun from getting to the blueberry bush.

Right. We won't get blueberries, so we actually have to reduce the amount of apples we can potentially harvest in order to get you know, a good blueberry harvest.

Yeah. And so, that's kind of the way it is in our gut. And intermittent fasting does that because the primary feeders need to eat, you know, every few hours or whatever it is.

And so when we reduce the amount of feedings that we're having in the course of the day, right, instead of eating six times a day, we drop it down to three times a day.

That gives time to allow for to de weed our primary feeders and allows for the secondary feeders to to grow and to thrive. And now we get a more diverse microbiome with healthier gut mucosa and healthier, more stress resilient intestinal cells.

Wow, right. Look dude, that is so good. Last question is like, you know, I mean, I absolutely love what we're talking about. And as you can see, why I love David so much.

He's extremely intelligent. And, is is is just, you know, got a lot of really great things to say about this. But how do you use heat and cold to improve cellular healing response for sure.

Well, you know, environmental changes. So anything that, you know, changes our environment or stresses our body that we would naturally encounter in nature actually is what we call a horse medic stress.

Right. So our ancestors would be exposed to very cold, right? At times you know, during the winter season. And also when they tried to bathe like they didn't have, you know, a hot water shower, right?

So they wanted to bathe. They got in the river and it was cold. Right? It was a natural stress response. It was a stressor that they were used to encountering.

And so our cells know how to adapt to that. And when we're exposed to cold for short periods of time, not not extended periods of time, short, short cold exposure, like doing a cold shower or a cold plunge, you may have heard of cold plunging.

We release these cold shock proteins. We also release, high amounts of dopamine and endorphins that, are great for mental health. And the cold shock proteins actually stimulate autophagy.

They break down old damaged cells, they force the mitochondria, mitochondria, which produce the energy that helps create heat in our body. So they force the mitochondria to become more efficient, and they stimulate the production of more mitochondria.

We call that mitochondrial biogenesis. Now heat is the same way, right. So when we're well, we're in a lot of heat. Like for example, you know, out here, you know, in the summertime in Georgia, July and August, like incredibly hot and humid.

Okay. And I play sports with my kids. I'm outside, you know, playing basketball or baseball. It's like I'm just sweating buckets. Yeah. And that is actually my body temperature.

Heat, Cold, and Cellular Resilience

It's getting so hot. It's stimulating heat shock proteins that break down old damaged, you know, old damaged mitochondria. Now you can also do that with infrared sauna.

Infrared sauna is an amazing way to do that. Natural naturally. You know, it's something that you can do to harness technology to get that benefit, in your home.

So infrared sauna, right. Stimulates those heat shock proteins. Also been shown to boost growth growth hormone. So you get autophagy, you get growth hormone, you get better.

Blood flow increases nitric oxide. The infrared increases mitochondrial melatonin production like we talked about to help improve overall mitochondrial health.

So getting heat and getting, you know, just short periods of heat, high heat and short periods of, very cold exposure

is a stress or medic stressor that can make you stronger, more resilient.

Now, one caveat if you're not sleeping well, don't start doing that, okay? Get your sleep dialed in first. Right. That's that's my my my my big thing.

Because there's a lot of people that will try to stack all these things, and yet they're not sleeping and recovering well and they overwhelm their system.

So whatever stressors you're encountering, you've got to be able to adapt effectively to them. And where where you rest and recover is obviously where you're sleeping.

David is you are amazing. Absolutely amazing. All the things we just talked about today, we talked about, you know, autophagy, mitochondrial health, you know, the gut microbiome.

We talked about, you know, all of the, the, the, the, the ways that we can impact my autophagy as well, for cellular healing. But all of these things will lead to you living a longer, healthier life, right?

Maintaining healthy, lean body tissue. You know, bringing your body through for me to hermetic stressors, you know, integrating some of these lifestyle solutions and dietary solutions.

David, I think that if you, doctor Jack, if you have people, integrate what you just talked about into their life, they would probably live another ten, 20 years longer or maybe even more.

But this is this is powerful. And because you and I are in this industry and we hear so many people talking about the next supplement or the next thing, it's like, you can't really put a price on, you know, cold shock proteins or heat shock proteins and the impact that it has right on the body, like this is the real that there's some real gold in here for longevity.

So, thank you so much for your time. Thank you for your genius and just your commitment to excellence. Even while I was in school, David, he would read books on the weekend when everyone else was going out and having fun.

Like, he just is so committed to excellence around reading, research, reading books. He's always reading, you know, 5 or 6 different books and, you know, the results are showing.

Whereas one of the top websites in the world go to Doctor jackers.com, check out his podcast. Where can they learn more information about you David. Yeah doctor jackers.com is the best way.

And my doctor joggers functional Nutrition podcast I'm on YouTube. So yeah, all of that. Functional nutrition podcast is number one guys.

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It is in it's a hot podcast. Got it. You know subscribe to that. And then go check out Doctor jackers.com. His blog is a place that I even go to get data and information because it's so well-written.

And there are some products there in his store that are transformative for your health and longevity. Highly recommend checking those out as well. David, thank you so much for your time today.

Really appreciate it, man. God bless you. And look forward to working out with you tomorrow. Sounds great. Thanks so much. God bless. All right. You too. What's up?

Thank you for tuning in to Doctor Talks. We hope today's episode has enlightened and inspired you on your path to optimal health. Each day is a new opportunity to make choices that empower your well-being.

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