Introduction and Guest Background

Welcome again to another episode of the Telomere Summit. I'm doctor Joseph Rafael, your host. And I'm very pleased today to have Doctor Kelly Halderman on to talk about autophagy and her personal journey, in functional medicine.

Doctor Halderman, completed a family medicine residency internship at the University of Minnesota. She also interesting. Has a naturopathic medical degree from Kingdom College of Natural Health, where she is the current academic dean of students.

She holds a certification in Metal Genetic Nutrition by the Neutrogena Neutral Genetic Research Institute, and certification from the American Functional Neurology Institute in Functional Neurology and Neurofeedback.

She is an active member of the American Academy of Anti-Aging medicine, president and founder of the American Association of Nutraceutical Formulators, as well as a member of the American Medical Association Physicians Committee for Responsible Medicine and Society of Nurse, a physician. Entrepreneurs.

Doctor Halderman has a doctorate in clinical nutrition. He's also a board certified in Clinical Nutrition by the CMS. CB Certification in Plant based Nutrition from Cornell University, and health coaching certification from the Institute for Integrative Nutrition.

Her interests include proper detoxification, cancer Lyme, of which she has personally experienced and recovered from, as well as regenerative therapies such as ozone and stem cell therapies.

Formulating superior nutraceutical products backed by cutting edge science. In addition, she is the coauthor of the newly published book entitled The Thyroid Debacle.

Doctor Hogan, who lives in Minnesota, where she has her own clinical practice with her husband, Doctor Charles Hill. She serves as director of research and product development to both professional health products and Randall Optimal Nutrients.

Welcome, Kelly. I'd like to start by asking you about your personal journey, toward wellness, out of illness. You look really healthy right now, so that's.

Tell me about it. Yeah, definitely. If you would have, seen me in 2012 bedridden, you wouldn't have said the same thing about, Doctor Kelly at that point.

I was practicing medicine and loving it. However, I started to come down with some very strange symptoms. I, I developed foot drop. I developed migraines, just debilitating migraines.

Out of nowhere. I was on call delivering a baby, and all of a sudden, I got this disco coma from the migraine. Came out of nowhere. I had to grab my nurse to grab the baby, and I.

And I thought, this is this is not working, right. So I was shuffled to the best neurologist, at the Mayo Clinic, was told that I had Ms.. Multiple sclerosis, and I needed to get my affairs in order go home and be with my children.

I was in my late 20s. And you know, that diagnosis of a death sentence did not work for me whatsoever. All the tools that I had learned, that were in my allopathic pocket at that time, they didn't serve me well.

And I needed to go and learn more. I needed to learn about detoxification and nutrition. And so I did and went and got a natural Catholic medical degree.

And I used those principles. And one of the principles we're going to talk about today is a tof AG, which is so critically important as to why I'm still here on this earth, why I still get to do these really neat podcasts.

And I can't wait to share with you and our listeners about autophagy and how it was one of the central tenants that took me from illness to wellness. Well, I'm looking forward to that.

That's quite a story left and went into, got a naturopathic degree and then all your are your work in clinical nutrition. Tell us about, excuse me. Excuse me about why, autophagy is such an important part.

I know it's, often mentioned in The Hallmarks of Aging, and it's sort of an integral part of things, in the aging process. What we give our listeners a little bit of an introduction to it.

Sure. So the Nobel Prize in Physiology or Medicine was actually given to Doctor Yoshinori Sumi in 2016. So, guys, this wasn't that long ago. He discovered the principles that underlying autophagy and what a top of is.

Kelly Halderman's Illness and Recovery Journey

So I'm going to give you the scientific version. And then I'm going to give you the version that I can that I can communicate to my teenagers okay. Scientific version is autophagy is the process where cytoplasmic components, whether that be old old mitochondrial parts or old, you know, that goes and things or viral components, you know, pathogen components, they are engulfed in membranes, vesicles.

They're involved in vessels, and they're delivered to the lysosomes of the cell. And the lysosomes will then degrade these old parts. And what's interesting about that is that that process, which, sounds rather simple, is implicated in many disease processes in PubMed.

Go ahead and type it in it's cardiovascular disease and autophagy, cancer and autophagy impairment and autoimmune disease and immune diseases in autophagy impairment.

And so when I describe this to my teenagers, I say it's like this, guys. It's like your body is full of little vacuums, but you need to turn on the switch of the vacuum, and you need to turn that switch on and actually move the vacuum.

A lot of things that you're doing when you're eating all those Doritos, when you're slamming all that high fructose corn sirup guys, it's not turning your vacuums on and your cells are becoming full of debris.

Right? And that's why we talk about this in the in the context of anti-aging. And as we age, our autophagy process naturally, unfortunately slows down a bit.

So we have to do everything we can right here, right now to upregulate the autophagy process in our bodies. And that starts with knowing what is the top and what turns it on.

But it also has to do with a process called mTOR. So mTOR is the opposing process to autophagy. So top is turn on the vacuum give vacuuming. Get that cellular debris out of there.

Get those viral components out of there. The opposing mechanism is called enter your m tau pathway. Neither one is good or bad. So this is where the whole autophagy thing gets butchered.

When people try and teach about it on the internet. And what you'll learn is autophagy. We have to have everything we do has to be autophagy. We have to cellular cleaning.

Yes, of course we do. But mTOR is exquisitely important in our body. MTOR is the building block. It stands for mammalian target of rapamycin, which is a mouthful.

But it basically means that we are building when the egg and the sperm come together. If we didn't have mTOR pathways, we'd have no baby. We have no, we'd have, you know, no pregnancies, muscle, muscle people,

bodybuilders rely on mTOR.

They rely in the process of mTOR to build that muscle. And as we age, as you know, doctor, I feel it's so important that we not overdrive either, either one of these.

We want to keep our muscle mass. We want to definitely keep the autophagy going. I think that's a really important point. You know, we hear a lot about, you know, inhibiting mTOR, cleaning up cells.

But there's two sides of the equation, really. I mean, you know, we we also hear about growth hormone and IGF one being bad for you. And you want to you want to lower that, and, you know, and that's a, that's a obviously a complicated and nuanced discussion, but it's sort of a balance between longevity and keeping cells healthy, but also performance.

I mean, we know that mTOR, like you said, you're not going to go very far if you want to be a big, strong, functioning athlete or, you know, we know that maintaining your muscle mass over, over a lifetime is very important because sarcopenia is a really bad thing.

So balancing the two of those, you know, you have to clean the junk up, but also make sure that the, the, the growth factors are actually working to, to maintain health.

And that often gets lost in the discussion. So I'm glad you brought that up. But what are some of the strategies that can help to turn on, autophagy and what are the you know, you mentioned high fructose corn sirup and, and, and other sort of junk foods that, that cause a problem with that.

What how do you, go about using it in your practice? And what do you what do you do to to turn on autophagy? Sure. So I think one of the important things is to look at what actually is overdriving, to our first, and then we're going to go into the autophagy so that overdriving of mTOR, again, these two processes shut each other off.

In essence, if you really want to, make it make it pretty tangible for people, just think of them as shutting, shutting each other off. Okay. So so if we're going to if we're going to turn on mTOR, what are the what are the type of things that turn on mTOR?

Well, I already mentioned high fructose corn sirup. It's going to turn on your mTOR, decrease your ability to cellular clean, iron enriched foods. So when you're overdriving, when you're when you're consuming too much iron and rich foods, which are your processed foods that'll turn on your your mTOR too much, too much methyl folate, too much methylated, vitamins and things can actually turn on mTOR glutamate.

So think, people who are drinking copious amounts of bone broth all day, all day long, that can turn it on, overconsumption of protein. So methionine is something that will turn on the switch with mTOR.

Unfortunately, pesticides and plastics are really something that our environment we're living in right now. We're really at risk of just living on this planet Earth of over driving our mTOR. And so does EMP.

There's some papers that suggest that EMF is actually overdriving the mTOR. Now, again, if you're if you're a child and you and you want to be in a growth pattern like this is where the nuance comes in, right?

It's it's that we're not trying to avoid all things that turn on mTOR. You know, and certainly, again, when we're talking about, having someone in front of us who may be, 60 years old and wants to do go down the, the, the anti-aging pathway.

But again, we have to take into account we don't want them to muscle waste, right? We don't want them that we want them to be able to to still continue to build muscle.

So I think of it as some of these are dietary factors. Right. So across the board, let's get rid of that high fructose corn sirup. Let's have a very balanced diet.

So the Mediterranean diet is known and has really good research. And and longevity research behind it. And one of the reasons, they think, is that the, the, the poly anions are actually very helpful for, turning off mTOR, turning on autophagy.

And one of the components people are talking about a lot now turning on, autophagy is, spaghetti. So protein is naturally found in a lot of the, the, the dietary components in the Mediterranean diet.

So that's my plug for the Mediterranean diet. Just eat eat whole foods. Right. So, you know, I learned a lot personally because I had genetic weaknesses in some of the genes that are responsible.

I had some snips responsible for those mTOR pathways. So I have iron processing, issues. The HPG and I have some pan one, issues with how I deal with pesticides.

So it's like a double whammy, right? It's like I, I actually might miss the root cause was more in line. Yeah. I mean, than usual.

What Autophagy Is and Why It Matters

So I was at risk because not only did I have one mole, which I didn't know what about, but my body couldn't clean up the cellular debris. Well-intended doctors, brilliant doctors were putting me on bone broth and having me take copious amounts of methyl blade and methyl B12, and not recognizing that, you know, my body was actually that was it was backfiring in a way.

So when I read about the studies correlating Lyme disease with people with genetic weaknesses in an amateur, I took a step back and I went, wow, all right.

I have to really make sure that I'm getting in my sauna. I'm sweating out all these pesticides that I'm really, making sure that I'm taking nutrients to help my body flush out, any of the residual pesticides in my diet.

I need to make sure I'm, getting a handle on how much processed foods with iron and rich, iron in there. I need to make sure I'm not consuming the high fructose corn sirup.

Dairy can actually, you know, and it's just intuitive, like, you know, baby cows drink the milk so they can get bigger, right? So dairy. I had to give that up, too, because it was overdriving it more.

So it wasn't anything or was like one magic thing that I was doing. But I will say is that looking at the autophagy. So let's go right into there. So what did I do to strengthen autophagy all again I dampened down on my mentor pathway.

And then I implemented in time restricted eating. So those little vacuum switches they really are sensitive to when we're eating and they are best turned on.

Autophagy is best turned on when we're in a fasted state. So I say to people, try and get into a tighter eating window, right? So Walter Longo did a, talk that just listened to that, said that over 18 hours of time restricted eating people at a higher, amount of gallstones.

So be careful. Right. Make sure your bile is flowing. I've also done a lot of work on, on, bile, making sure that that's flowing. So you want to make sure your detoxification system is working, but again to go back to it.

So I tighten my eating window with autophagy. And to, to the, the process of autophagy. I also make sure that I exercise and again, it's like it's just it's just a, it's something we all have to do.

We have to we have to get that strategy in our, in our lives. And I noticed I noticed when I started doing these things and I started taking, things like resveratrol, the quercetin, things that are in a, I love a product called a top AG Assist from Professional Health Products.

When I took that, especially in the fasted state, I noticed. I mean, okay, so there's three signs that I use to look at someone to know that they might have, some autophagy issues.

So look at the backs of your hands. If you have little age spots all over your hands, that's a sign that you may have some imperative toxicity. Now, it's not perfect, but I will say this is that my hands I looked like I was ten years older than I really was.

And I you know, I was like, well, you know, when I had line I saw rapidly, you know, just my skin was just looking terrible. I started to implement in this balancing of a top and autophagy versus mTOR.

My my hands are almost completely clear. So that's controlling your time where you can kind of look at someone go around, and then during the holidays when I kind of slip off the wagon, I really do see, like I take pictures and I see a little bit of spots coming back.

Another way you can know without doing your genetics. If you're at risk for someone who needs to upregulate your autophagy is how are your liver enzymes doing?

How is your jaegeetee? How's your muscle mass? And finally, are you obese or overweight? Those are some signs that your autophagy can definitely be impaired.

It's, it's interesting that the I guess one of the, the problems with, you know, trying to clinically manage autophagy because those are interesting pearls that you gave, but there really isn't any blood test, particularly, I guess, you know, like for telomeres or stealing your length, you can even do a telomerase activation, you know, for other hallmarks of aging, there are things, but mitochondrial function, and, you know, in autophagy it's difficult.

So and you mentioned the time restricted eating. That's a that's a great thing to do. I do do that as well. But there's some controversy about how long you really need to be in the fasted state before autophagy kicks in.

And some people think it's really actual fasting. You know, 48 hours, 36, 48 hours before autophagy really kicks in. But how do we know we don't have a marker for.

Right. And we know that it does take at least three days, I think of of water fasting to get stem cell activation. So we do have that data. So I am completely not against fasting.

I think it needs to be under the care of a licensed health practitioner because of all like the blood sugar issues and other things like that. But with the haffajee, we just we just don't know at this point.

But there's a lot of other good data that says that, like, like really getting down to a time restricted feeding. And these are a lot of mirroring studies that we have to do.

But, improvement in blood sugar, you know, I typically wear a CGM, a continuous glucose monitor. So I'm really looking at, what the topology, what that time restricted eating is doing, to that.

So I think that is a really important point, that we're, you know, we're not quite sure, but the data is leaning toward it. And again, typically in medicine, we have to wait 17 years to get really good clinical outcome and data and things that we should do in to the doctor's offices.

So 2016 wasn't that long ago, and that was the New England Journal of Medicine. Who says that? Oh, hey, it takes 17 years to get this into your doctor's office.

So these are the types of things where, you know, if it walks like a duck and quacks like a. That could probably us, but we don't have we really don't have the study to kind of like show everyone.

But again, it's looking better and better. And I mean, look at all the data that Walter Longo's coming out with a fasting mimicking diet. It's really phenomenal.

Yeah. I wanted to, just go back to a couple of things. You said one. Well, I mean, I think mTOR is kind of a nutrient, sort of intermediate nutrient sensor.

So you mentioned high being overfed, high fructose corn sirup, high protein. And so I know that those are all things that, that, that increase for I don't know how to, how to pesticide do that.

So there's papers that show that, that pesticides will just drive the to, the indoor pathway. Yeah, I can I, we can link to those there's at for everything I said there's, there's, there's studies everything that I yeah, I was just curious about what it was and then also just for our listeners, can you just describe what spreading is since.

Yeah, everybody knows what it is. I know I am right now, so to speak. So sperm eating is a poly and the and it's found in wheat germ is the number one place that it is found.

It's also found in mushrooms and soy. So again there there is a company I believe that now sells, sperm 18 but it is from wheat germ. So you have to be careful if you're gluten sensitive.

You know, if you have celiac, definitely very be very careful. And so that's pretty new. We didn't have that. But we we do have the data again from the the Mediterranean diet, which we know that is very high in the poly amines.

And I will say this is that any goes beyond autophagy. I mean enduring studies. We're looking at lung fibrosis reversal. I mean it's really the data is is very copious when it comes to this is fermenting.

So I think it kind of drives home where sure, we can go after all these fancy, nutrients and things. And, and if I didn't say berberine, that is literally one of my favorite.

New to me too. Yeah, absolutely. I mean, it's, you know, it's like metformin, where the anti-aging data is really, really great. But again, so there are select nutrients where I think they're really important.

Berberine is one of them. But however I think it goes back to lifestyle and I think it goes back to the epigenetic influence, the things that we, that we choose to put on our plate.

Yeah. For sure. So, autophagy is cleaning up junk in your cells. There's also my haffajee, which is, I guess, cleaning up mitochondria. Talking about the difference between those.

And then I guess the mitochondria are also very much involved in the whole process of ABP ptosis, which is another way of cleaning up the cell by actually getting rid of it.

mTOR, Diet, and Lifestyle Triggers

If it's if it's damaged beyond repair. And that gets into the whole field of analytics. A lot of things you mentioned quercetin. I don't know that you mentioned Facetune, but but other things in that field, in that category, can you move it from beyond cleaning up the cell to actually getting rid of cell?

And in that regard, you want to be a little bit careful about? I mean, I know that's said a license is often done in cycles because of the stuff that you mentioned.

So let's talk a little bit about about that and how you approach that clinically. I mean, like certain things, you would take all the time perhaps berberine.

But other things, maybe you don't want to take all the time. You don't want it to be like you said, you don't wanna be pivoting more when you're doing, you know, a muscle building cycle, or doing it sort of an anabolic cycle, of, of trying to put a like, put on muscle.

So how do you approach that in your practice? Absolutely. It is so specific to the person who is sitting in front of me and their goals and where they're at and their age and their risk factors.

So, you know, if I have, a person in their 30s who is looking to continue to, to build muscle and they really want to increase that, I mean, they're they're going to have a whole different balancing protocol than, let's say, like a 70 year old with prostate cancer, where we really we really look at them as, okay, we have to really, go hard on the autophagy, go hard on on that end, whereas the, the, the M we can really we don't really need it's kind of like what's the most emergent at this point.

Like what are we going to deal with. So that is even for our listeners too. There's no hard fast rule to this at all. I think of myself because I've had chronic illness.

I find every day really hard to stay healthy. I do about about a million things. That feels sometimes to stay in this and and live in the environment we live in and maintain.

So my strategy for myself is more of a lifestyle of, managing my mTOR and then promoting my autophagy. Now I will cycle through. That's a great point, doctor Rafael.

I, I will also cycle through. So I'm, I'm going to do I do a quarterly water fast. And so when I'm doing that water fast, I'm definitely going to, make sure that I'm really promoting all, oh, you know, hands on deck with, with the, with the autophagy make sure that that's really optimized.

But again, when you get off of that, because it was so heavy on the autophagy, I want I want to make sure I'm not losing any of my muscle mass. Maybe I'll go go into more, a training protocol where it's harder.

So I will balance in the mTOR. And again, this is very, it can be difficult because there's no magical lab test. I can't draw my blood and go, oh, okay, so we need to go seven points below on your more, and we need to go five points above.

You need to have a savvy practitioner who is reading the literature, who is learning, who is listening to things like the summary to get all this cutting data information.

Again, because we don't want to do this. We don't want to hurt anyone. Of course, that's our Hippocratic oath. In fact. So I would say that again, it's it's depending on who's sitting in front of me.

So, if I have someone who's going to be in a bodybuilding competition, we're not going to really work, and they have no chronic disease. We're not going to really worry so much about the autophagy.

I don't even know if I have them, you know, take down their eating window because we are trying to accomplish a different goal for them. Yeah, I mean, that's a great point, personalizing to each patient and their goals.

Just out of curiosity, how long a water fast do you do and how do you how's it how's it feel? What's what's what's your experience of it? Well, the first three days are awful.

Okay. But to be honest, it's just awful. You just don't want to be. Just don't call Doctor Kelly. And the first pass. Then on day three and four and five, I usually can get to five.

I try and get to seven, depending on what's going on in my life. I feel amazing. I feel, you know, my Bdnf in my brain is just rocking and I mean, like, but I just, I feel like my little cellular vacuums, my topic is just going after.

And again, I have genetic weaknesses. So if I didn't mention those specific snips, I want you right now. So it's the, like one. I mean, I have muscle, so I have it's almost like I have to do this.

So what is it? You okay? One again. You're a one. You okay? Two at five an MAPK3 and eight. And those are, snips that do them. I recognize these as autophagy ones.

And the map kind of, pathways, but you. Okay. Is. What is that the. You okay? They're definitely. They're definitely genes that have to do with that. Have to do with the process of autophagy.

There is a wonderful paper that we can link to and PubMed where it talks about the it even groups them into the known autophagy related snips. And then they go into, the studies on cardiovascular disease.

And, you know, we're starting to think about this. We're starting to go, okay, the literature is robust with the studies that show autophagy linked to, again, cardiovascular disease, cancer immune issues.

So if they're linked to what can we do again? Now we're thinking probably in the pharmaceutical, mindset looking at like the studies and probably again so we're like what drug can we use to promote autophagy.

But I'll tell you this, guys, there's no better drug out there than fasting. Exercise at this point is not better than this. And then these natural compounds berberine again resveratrol quercetin.

Quercetin is an ionic four. We can all use a little more. I know for in our life in this pandemic right now, two doses just for ourselves. What doses are you using a rose or are you are you, modulate them based on on goals?

I mean, of course, there's usually around 500mg. Maybe. Sometimes people do a thousand. There was a study published, where they looked at quercetin on the sat nav in person, in study, you know, and they cycled it though.

So it's kind of, it's kind of interesting what dosage you, you normally use. I use about 500mg. And again, it depends on is this person, did they have an illness right now or are we doing maintenance?

You know, and berberine is completely specific to, the person that I'm working with as well. I mean, there's a lot of studies showing, like, what ranges and things, but, and I'm always searching the literature.

I'm always like, okay, do we have any clinical studies? We have any studies in people like, what are we looking at the doses. And so I look to people like you, I'll see you next week at a forum I look to.

I grab people like you and say, hey, what do you know about this? You know, what do you know? And I'm always looking to like to call my colleagues to help refine, what I'm doing.

I'm very grateful for minds like yourself. And, and so your, this what, company do use to or how do you get how did you get your snips these specific ones.

And is there is there something a company like that gives us sort of good annotation of them so that people know what to do with it? Sure. So I use functional genomic analysis and that has to be ordered by a licensed health care practitioner.

I on the fence right now with a couple, non licensed companies. So I'm not going to mention the name quite any of the names quite yet because I'm just not satisfied.

I'm trying to actually help them, really, really get a really good test. So there's a lot out there. But I would say that if you're searching for a direct to consumer, we call a DNA test to see if they have autophagy cells, see if they have what what we're looking at.

And and, and make sure that they do. I think it's important that we have that. It's just more information. And again and it made sense to me why I got Lyme disease and I ended up bedridden.

Why didn't why, you know, why are other people there's a lot of, you know, more genetics behind that. We could talk for hours about that. But one of the things I just had such weakness in my body's ability to clean up, cellular debris.

And it makes sense if you're drowning in cellular debris, the chronic illness may be, you know, it might be chronic for you. And then the other person, it could just be, oh, I had Lyme.

And I got over it. And, you know, there's again, there's a lot of things that go into that like, work of Andy Hayman

and the HLA and you know, all that, all those, things.

But but yeah, I really, really I mean, I think that I talk to you every day. It's kind of like, you know, the differential vulnerability to Covid, you know, people, some people, have, you know, senescent immune systems.

They have overreaction from their inflammatory pathways. And typically they're older people do not always older people. Same thing. It's you know, I've always have a obviously quite a few patients have had Lyme and chronic Lyme.

Some people, you know, I live on the East Coast here. So people get Lyme all the time. And many patients sort of get lined to take docs to cycling and they're fine.

And they, you know, they do that over and over again. Yeah. Another one's get it once and they're, they're done for. You know the chronic Lyme doctor.

So it's it, you know, obviously has something to do with, genetic predisposition, lifestyle, other things. So it's a, it's a really interesting point that you make there.

I'm just curious, not having myself actually done a, a multi-day, fast. Okay. Are you able to work when you do that? Probably about the first three days.

You you go back to the office after the when you're feeling better the fourth through six days, or what do you do?

Fasting, Exercise, and Practical Autophagy Strategies

I will say this is that, when I started to implement back in, I think it was 2015 time restricted eating, I, I thought I was going to die in the morning when I didn't have, like coffee with the creamer.

And I mean, I felt horrible. I was so in the fermentation process. Right. So you have oxidative phosphorylation, which is what we should be, and we should be able to burn fats.

And I was terrible at it because I was sugar addicted. So when I was in that state, it was, it was so hard to even get a 12 hour feeding window. So over time and getting my eating window tighter.

So now it's around, you know, eight hours. And again, this is don't just do it because I'm doing it. Really. You have to be very careful because it can backfire.

Well, what my point is, is that now when I'm doing the water fast, I train my body. It's like I didn't just jump out, you know, a bed and just decide to run a marathon.

I have been doing these many marathons for years now. So you increased you increase from a one day fast to then to a two day fast and then a three day fast.

You just said I'm going to do a seven day fat. That's not I mean, I would, you know, echo your experience with that. I was for a long time, somebody had to get up and have something to eat.

And then I started to, about two years to do intermittent fasting. And now, you know, it does take your body has to you have to adjust to it, changes in pathways and and how your mitochondria work.

And now, you know, I haven't eaten since 8:00 last night, and I'm sitting here, you know, perfectly fine and happy, not dying for lunch to show up. So I, you know, I did it for the listeners and, and talking to their patients.

And when I tell patients this, you know, I say, look, it's not going to be that easy. And, you know, maybe don't do it. It, you know, start doing it every day.

You do the days that you feel like you can do it, you know, sort of you will gradually acclimate to I think it takes like a month or two, something like that, before it starts getting easier.

Each each time it gets easier. But it's it is really pretty fascinating how those changes take place. And I guess the, the first three days suck, no matter what.

No, in the long term, fast. But but you get I guess you get better at it. So, pretty interesting. We, we touched on quercetin, ceramides and all these interesting molecules.

So, doctor, I know you did say something about Covid, so I wanted to bring up. Okay, sure. That I, I oops. Here, hold on a second. There. Lost your. Kelly, can you, anyone.

Yeah. Oh, okay. You're back. You're back. So, this article was recently published. It was October 2021, and it's called Harnessing Autophagy to Fight SARS-CoV-2.

And so this article again, is we're living in these times where we have to really we're we're in the fight of our lives, we need to have our bodies working in the most optimal state that we can every single day.

And I think this is a really great study that points home to that. There were thinking about or thinking about how important I get. I started off this conversation talking about what autophagy is and how it's responsible for cleaning up viral debris as well.

And so looking at that and then bringing that in as another strategy to help have our our best health during this pandemic. I think that's worth mentioning because we want to do everything we can.

And so one of the papers said there was a sort of a theoretical paper about it. Or was there, so the paper mentioned that that autophagy is linked to all these other, these chronic diseases.

And so potentially we wanted to use something that could, upregulate autophagy because there's paper showing that how it impacts the immune system. So it was really just just it's the start of the conversation.

It's again, this is probably they're looking at making a drug, right? They're looking at trying to make a drug that would upregulated property to help with Covid.

But again we have we have a lot of strategies that we can use right now. And like I said, all those things that overdrive mTOR. A lot of them start with your fork.

You just write who's better with with what you're, you're putting in your body and a lot of them in your environment being really cautious about, you know, the, the pesticides and things.

So just making the best choices that you can day by day. And then looking at the benefits down the line because again, if you know something that correlates.

So we know that autophagy when we have genetic weaknesses, we're seeing that, that, that, that we have increased risk, amount of cardiovascular cancer, all these, you know, these things.

So I don't I don't think it's a bad strategy to just look at the overall 30,000ft view, look down and say to yourself, you're like, how has someone look at your hands?

Has someone do your letters? A practitioner look at your liver enzymes, your gut have someone do your body mass index, you know, make. And again, if everything points to the fact that you could use, upregulation of this, this very important system, this very important mechanism, and this is a highly conserved mechanism, meaning it's biologically so important some of these, these these mechanisms, I mean, mTOR pathway, the, you know, G they're highly conserved because they're an important that we're still around here as a species.

And we really. Yeah. So since we've been, we've covered like, as I mentioned, quercetin and the other ones that you, use, anybody know how people say a physician or physician, that you use that and, what's your experience with it?

So Doctor Jo Cleaver recently, this summer turned me on to physician. So I just started, you know, getting, getting my experience with it. I think it's a fantastic, nutrient.

I know it's naturally found in strawberries. I want to say. Right. But again, my, my experience with it is, is pretty fresh. I, I put myself on it and, the tea is 65, and I felt like, I had some good results.

Like my, it. When I say good results, I always think, well, what does that mean for someone? Well, I had, brighter brain for. I just feel like my brain is just so locked on.

My sleep is on point. I wear an aura reading a track. My sleep like, oh, my. I mean, like, if I. If I don't get a good night's sleep, I'm like, what did I do wrong?

What did you know? So I use objective data when I'm trying things. I feel like, a combination of the physician with the 65 really, really helped. And then, I'm also, regulating my nerve two pathway.

So the nerve two pathways, the anti-aging pathway in the body, the anti oxidant pathway in the body. Upregulation of it will increase your levels of glutathione.

So the, hydrogen, peroxide, downstream. So what you're doing is you're increasing your antioxidants, protecting your mitochondria. You don't want to overdo that pathway either, because you just you can't just flood your body with antioxidants.

It's actually going to backfire, right? We you know, you need things that are supposed to degrade to degrade. So I, I do cycle the, the, nerve to upregulation.

In that pathway, I cycle that one for sure, but also just induce whatever Doctor Cleaver recommended. I don't, I don't, I don't know if something I have just curious.

I don't know. You know, it's interesting that you mentioned 65 and, physician or, you know, physician supposed to be one of the strongest, sort of natural, analytic, molecules.

And, you know, the reason I think it's usually is because five is it is important for mitochondrial biogenesis through, the 1968 telomere length, and until 1965, through augmenting telomere length, or maintaining it in some cases, improving it improves your mitochondrial biogenesis.

On the other hand, you want to get rid of the the mitochondria that are that are that are not functioning and damaged. And so those two together, people often take care of the the sort of housecleaning side of things.

But forget about the other side of things. I kind of maybe like it a little bit to bones, where you have the osteo class to come in and clean up, you know, damaged bone and then.

But you have to have the osteoblasts come in. So it's estradiol for the class and testosterone and other growth factors. Progesterone growth hormone through IGF one, the increasing.

And that's sort of the same thing that you're kind of doing.

Genetics, Supplements, and Clinical Personalization

You have to look at both sides of the both sides of the equation, which is, which is I think, you know, really good. And glad that you got, that interesting sort of clinical improvement in yourself up to see.

I have to see about that. I'm going to try myself. Speaking of giving things a try, and we're talking about mTOR, which is, you know, mechanistic or mammalian, target of rapamycin.

Do you, use rapamycin? Do you have any, have a lot of thoughts on rapamycin? Let me let me just get on my soapbox here. Rapamycin has a lot of side effects, right.

One of those side effects is immune system dampening. When you are living in a pandemic, do you want to be cycling in rapamycin at this time? I don't think so.

I think we should hold off. And also some of the side effects can be extremely unpleasant, like very large mouth ulcers. I've heard that one that are, very, very painful.

I think that this time, again, because of the mechanisms of rapamycin and it's a hard it's just a tough drug to get Ahold of. I myself have never tried it.

I've got a lot of immune things. I just don't want to rock the boat. I do have close personal friends who have tried it, but as soon as this pandemic started, it was, we're not going to do this.

And again, we have we have berberine, we have metformin. You know, metformin does shut down complex one, the oxidative phosphorylation chain. So I mean there's a lot of data on it.

But again guys like we're still learning. You know we we're still learning. And that's our promise to our patients. And we we're really we're making sure what we're doing is as safe as we know.

But we have strategies better than I think at this point of rapamycin. How about your thoughts? Yeah. So, you know, I've kind of evolved on it over time.

I think that what you say is true, the doses that are used in chemotherapy and transplant medicine, but, in the low doses that people talk about now, once a week, 3 to 8mg, you know, it may not be immunosuppressive.

Of course, if you're getting out the salsas and other things like that, then perhaps you need to lower the dose. And you know, Joan Manek, published a study on, sirolimus, looking at improvement, actually, in vaccination response, in elderly people and flu vaccination response with, with it.

So it's kind of like a dose. It's hard to know for sure. You know, you know, Matt, Caroline talks a lot about these excessive, worries about immunosuppressive and even potentially being slightly immune.

A stimulant, because of what, you know, medical published. So, I haven't tried it myself. I do have some patients that have, tried it, physician patients that wanted to do it on their own.

And we look at we're looking at biomarkers, epigenetics, DNA methylation clocks, looking at their telomere length, looking at their, senescent cells in a, in a, in a, lymphocyte subset panel to see whether or not they're having, you know, you know, what direction we want those to move in.

So, it'll be interesting to see I haven't gotten any results back from that yet, but I know there are people who are using it clinically, in the sort of low dose once a week, and talking about some pretty good results.

So it's, it's interesting, I think, you know, and Matt, Caroline has just done a lot to, to talk about this. The, she's sort of one of the mTOR mavens out there and the head of the Dog Aging project he's talked about.

It's, it's been beneficial. So I don't know. I mean, I think I just want to get your thoughts on, I mean, I, I definitely hear you and that's sort of where I was and, and I'm now sort of not not sure yet whether.

Yeah, I'm just watching, watching for the, for the science of events. That's great. And that's kind of the the boat I'm in right now. A lot of the colleagues who took a step back, they're people that are my mentors.

And so again, I, I myself, I, I like to think for myself, but I like to gather a lot of data. So it's really this really interesting. That research I'm going to definitely hit you up, for that to take a look at it.

Yeah. So, so, yeah, it's, it's, it is issue because you want to you want to have a good vaccination. I think the important point that you make earlier and that we should emphasize is that if you haven't tried time restricting, if you have a try, you know, you know, a fast, potentially, regular exercise and all those things.

And, you know, you don't need to be jumping on rapamycin once you've done all those things that you want to get, you want to get sort of the the really top, top stuff.

I mean, Peter Attia has talked about, you know, he does all those things and he does, you know, do rapamycin. I think he has in the past, regularly and regularly fast.

And so, that is sort of the cherry on top to get your, your. Yeah. I think the low hanging fruit for the majority of people, I mean, I mean, I am, you know, that that Peter is his way up there at the top, right?

So I, I really, I think that the low hanging fruit is the most, actually the most important. Again, it's not sexy to say like, hey, you know, lay off all the dairy and, you know, the, all the, you know, the protein.

And again, I, I'm, I eat, I need I don't eat a plant based diet. I, I, I definitely have a well-balanced diet. Try to eat more Mediterranean. But again all the low hanging fruit will really pay off in dividends.

And of course we're always looking at things. But that's a really excellent point. It's like we're not $70 in our mouth and then try and that would be very American.

I know it's very American. So there's no words in here right. And so in terms of so the, the, the genetic testing, snip testing, do you do that on all patients when they come in or is that sort of targeted.

Yeah, I do I love it I, I definitely can go through and I don't treat snips. I look to see if there's something that could be a weakness that's contributing to what I'm seeing, you know, phenotypic in front of me.

So I, I like to use the functional genomic analysis because it also has all the snips related to everything I went through for the, tour. It has the HFC and has the on one.

It has all your, methylation. It has the CAC and a one see, which is related to possible EMF. Oversensitivity with your calcium, get a voltage channel.

So I guess you don't have a AirPods in right now. I, I don't, but I have a pair, but I use the wave block, and I have an ef emf meter. And I will I've tested out these little wave block there, and you put them around your your AirPod, and they show that the EMF goes down.

But I, I definitely try to mitigate the, the EMF. It's it's so very difficult especially, you know, when there's so many bad products that, you know, just put your tinfoil on your head and you know, in 99 five instruments, it's it's a racket and it's really frustrating.

For, for you as a doctor as well. It's very frustrating when people get taken advantage of. So buyer beware. The best thing you can do is just buy a timer or use your phone to turn your Wi-Fi off at night.

That I mean, that if that should be the minimum you're doing absolutely is just to have that Wi-Fi shut off at night so you're not baking in it when you're you're talking about your router or on your phone.

I would prefer that someone turn it up, turn off the router. And some people have apps where they can set, okay, turn this off at at 12 a.m. and turn it back on at six.

And that's what we have in our house. Worth. You know, it's just time to go to go off to bed. I have a problem with

me a lot of the department, but I gotta get everybody else to turn them around.

Oh, yeah, that is tricky. Because I know you got to get on the Wi-Fi. There's, like 13 of them there, that I could log on to. And so they. All right? Yeah, that's that's that's the house we're living in New York City.

Yeah. Magnesium is our best calcium channel blocker, right? That we have. So do you have patients on magnesium regularly? Yeah. Do you? So the HF is. That's the hemochromatosis gene you're talking about or. Yeah.

So, yeah, I mean, that's that is one of the, sort of that is the most common, genetic disorder amongst Caucasian populations, and people don't really appreciate it that much.

It's, it's, it's a northern, northern Caucasian population, I suppose I should say, but it's about 1%, and I've seen quite a few in my practice. And I think it's great to screen everybody, you know, doing ferritin is a good start.

You know, do you try to keep the protein in a window? Yeah, definitely. And I think that we could, you know, again, we could do a seminar on the HSC pathway and have these snips.

But I would say this is that please be mindful that in medicine we like to do black and white. We like to do if you don't have hemochromatosis or you do, however if you're looking at your genes, you can have a hemochromatosis light like I like to tell people where you know you, you'll have this, this, upregulation, you're the iron in your body will be will be more so.

And then you, you're looking at, you know, your ferritin and all these other. There's some things look normal and they're not. It's very nuanced. But again, some of what we are diagnosing is, iron deficiency anemia.

That's not true. It's the iron is not being properly utilized. It's being stored in the tissue. It's it's fairly it's very difficult. But again, having somebody take a look at your genes, especially if you're Caucasian, can be really important.

Well, listen, this has been a really fantastic discussion. I've learned a lot myself, and I, I just wonder if there's any, parting comments you'd like to make up for.

We wrap it up. So I'm just very thankful that, you invited me on. I'm so excited I got. We started off this conversation, and I was telling you how excited I am to learn more about telomeres and all the other things that the wonderful, guests you have.

Their topics are fantastic. So, kudos to you, for putting this on. And I just really excited to learn myself. Thank you very much. It's been fantastic having you on, and I look forward to seeing you in Vegas.

And I guess just a week or so. Yeah. So thank you very much.