Introduction to Mitochondria and Moto Catalyst

Hey, everybody, we want to thank you for joining us here at the Peptides and Bioregulators Summit. Today I have a real treat to get to interview a pioneer and innovator in our industry, which I find very rare these days, a Mr.

Sundeep Dugar who has blue oak as his company. And they produce a very, very powerful mitochondrial supplement. For a long time, I feel like one of the most overlooked aspects of health itself is mitochondrial energy production.

We know it's the powerhouse of the cell, but we know that many, many things in nature have that negative ion transfer to the cell membrane, which can help to increase ATP.

But I hear there's something further than that. Sundeep. So I'm going to let you ride. I thank you so much for joining me today. And why don't you get started by telling us about this innovation in this Moto Catalyst product you've created and the magic that is Moto Catalyst.

Well, Michael, first, thank you for having me. It's free to join you and have this conversation. It's something that's, near dear to my heart for the past 16 years.

So I've been in this area and, you know, you've really given me a beautiful opportunity and open field to speak to. But that also is the the challenge, right?

There's so much to talk about. So true. But but we'll take it one thing at a time. And then please don't hesitate to interrupt me or stop me. You know, as you said, let's have a great conversation.

But I believe an important one and I believe a critical one. So, you know, and some of the what I may say may be redundant and known, but just to set the context, you know, mitochondria is the genesis of life, right?

Without mitochondria, there will be no life on planet Earth. Let's be very, very clear. Plants have it. All animals have it. Every cell in your body has it except the mature red blood cell.

The only cell in your body that doesn't have it is the red blood cell. If I were to say some basic, fun facts about mitochondria, let's start with that.

You know, you have more than 100,000 trillion of them in your body, which means that you may have more mitochondria than human cells. And max mitochondria is actually a bacteria body.

So, so the idea of a endosymbiosis hypothesis is that about two, 2.5 billion years ago, through the Great Oxygenation Event when oxygen came into planet Earth, there was an end.

The symbiosis between two unicellular cells, an amoeba and a bacteria body. This is how they fed each other. So when this amoeba engulf the bacteria, instead of killing it, the bacteria survived.

And the bacteria is what we know today as mitochondria. Wow. And it turns out that what the mitochondria the bacteria produced became the fuel for the amoeba to live off.

So create a beautiful relationship between what we now call mitochondria and the cell it lives in. Wow. And so so so just think about this. That there's an amazing accident that happened.

Just some side notes. This is the time when oxygen levels were going up on planet Earth. And perhaps and perhaps if this event doesn't happen, the oxygen levels will continue to go up because this is has started.

Yeah. But what happened is this endosymbiosis created an event where this bacteria started consuming the oxygen to produce ATP. That is what we call today oxidative phosphorylation.

So perhaps here suddenly oxygen levels are going up and they leveled off at about 21%, which is what we have today as this proliferation of the mitochondria in this amoeba, the modern eukaryotic cell happened and started consuming the oxygen.

Okay. If not we would have had signals of life but never live because excess oxygen would have killed everything. True. Wow.

How Mitochondria Power Life and ATP

So one never knows. Just imagine. So these are accidents happen. And suddenly something that could have been toxic became leveled off and provided the fodder for the bacteria which uses it up to give ATP.

And suddenly this onion, a cellular animal, had a lot of energy to become the complex organisms we see on planet Earth today. Wow. So it's a beautiful story.

Yeah. And that's that's, you know, how important it is. Okay. But then it goes beyond that because every function in your cell every cell it doesn't matter.

I mean you're nodding your head, you're blinking your eyes. You move your hand, you laugh, smile, cry, eat whatever. Every function of that body is managed by the energy produced by the matter.

Wow. Okay. Genes cannot make proteins. Proteins cannot be folded properly. They cannot go to the right places in the cell unless the mitochondria provides the energy.

Not only that, when you have an insult like a heart attack or stroke or you have diabetes, your mitochondria sense that stress. They are the ones that come to address these stress.

Okay. Without it you would have a disease state that your body wouldn't get defined. And if you think about this that it leads to a concept that a good colleague of mine and a great intellectual, professor Bob Navios, called you know, meat proposed is called salad Genesis.

What that means is that your body has a concept to heal itself. Okay. And it is true. When you break a bone, what do you do? Put a plaster, but the body heals itself when you get a cut.

You put a Band-Aid, but eventually the body heals itself. Okay. Yeah. So the body has the ability to heal itself. And part of. And this is all driven by the internal mitochondrial processes.

As the mitochondria sense the injury and they initiate the processes that would do the healing. But when this insult becomes chronic, that means it happens every day.

It's like if you break your bone every day, right? Yeah. And or you have a chronic disease. The mitochondria start to lose that battle. And that manifests itself to the phenotype of the disease you see.

Yep. Yeah. We see that super common especially in treating and in functional medicine. You see immuno senescence. You see senescence selectivity build up zombie cells that don't have energy to stay alive, get accumulated in tissue, which leads to autoimmunity.

And chronic illness which leads to further disease in the body. Is is that downward stream effect? And like you said, it comes I think so many people mistake in adrenal burnout and cortisol exhaustion.

But the higher deeper fold is it's actually mitochondrial exhaustion. Exactly. Yeah. You got it. Yeah. So that's the big picture. So let's step back a little bit.

So look at what this system is doing. What it does is makes ATP. We all know that no ATP. Think about it. What it does so proficiently. And every day you make your body weight amount of ATP every day.

So that means you're making 150, 160 pounds of ATP every day. Well, okay, a lot, a lot, right? Yeah. So and what is this, ATP, ATP what the mitochondria is doing is taking two negative charge molecules and just joins them together.

Now this is a reaction or a thing. You cannot do it in a flask. You cannot do it in the lab. It's like saying let me fuze two softballs together. No. So just imagine what it's doing so proficiently in every cell of your body all day long is putting almost a thermodynamically impossible process happen?

Wow. I mean, I couldn't do this in a lab. Yeah, but he does it so beautifully and so efficiently. You don't even know it's happening to that extent. Fair. Yeah. Yeah.

And in that, creating it stores the energy. So the energy it needs, it stores in that bond when the ATP goes out of the mitochondria into the cell. What it does is takes that third phosphate that comes at the spot, it breaks this bond.

And in that releases the energy that powers the cell. Okay. So it's all thermodynamics under the laws of thermodynamics. Nonrefundable. Non compromising.

I mean, it's just thinking about this at the first principles of science. If you're not completely gobsmacked, you know, blown over nothing will. Wow. Yeah.

I mean, it's like a microcosmic symphony. It's like. It's just crazy. It's so beautiful, so perfect. I mean, something that just requires an amazing process that we can't do it outside the mitochondria.

Yeah. Right. So. So, given this whole idea that mitochondria makes ATP produces the energy, it does. It's not only the power of the cell, it's the sensor of cells health.

All this is fantastic. But now here comes the human reality. Okay. As we are growing, your body is exercising internally because the cells. So there's an internal exercise that's happening.

So your bones are growing, your brains growing, your muscles are growing. And at age about 21, you hit the wall. You stop. Right. From then on, you lose mitochondria.

That's the process of aging. All right. So now at age 21 2021 we can hear you're at your peak mitochondrial function. You've grown you're feeling great.

From then on. Every decade you're losing 10 to 15% of your mitochondrial concentration in the body. Wow. And that's aging. Wow. Right. So as you grow older, you start to lose your skeletal muscle strength as much as you were able to when you were about 20, when you can't run up the steps as fast, your metabolism slows down.

And body and nature, they don't like to do waste energy. Right. I mean, Einstein put it I mean, a quote attributed to Einstein says, you know, energy.

Is it all? There's nothing more to it. Energy is the universe. Yeah. Right. Yeah. Okay. I mean, if you look at our. It is so true. Yeah. I mean, we live because sun gives us the energy.

If the sun were not there, you'd be done. 100%. Yeah. Nature itself is an energy machine. Machine? From lightning to iron. Reactions to rain to cloud. Everything.

Yeah. You know, it's talked about that. You know, mass. And it's true. Mass and energy cannot be destroyed. They cannot. Some people argue that solid body we have is nothing but energy with a very low wavelength.

Yeah. Okay.

Aging, Exercise, and Mitochondrial Decline

So as you lose this mitochondria your bioenergetics goes down so you don't recover as fast. You know you go out and do your body exercise at age 35. Then you do it at 45.

You can do less but you don't recover as well. You strain yourself, you get tired faster. And it's all related because your internal energy is going down, because you start growing.

Then comes the interesting part also, that the only natural way we can think are we know off of making more mitochondria is exercise. Fascinating. Okay, so that's it.

So if you keep exercising, you keep generating more mitochondria because instead of this internal exercise of growth, you have an external exercise of energy demand.

And the moment you create the energy demand, the mitochondria kick in. Everybody makes more mitochondria because it says, Michael is a crazy guy. He's running a marathon.

He needs more energy. Yeah. And he's going to do well at 300 pound weight lifting. Whatever. That's more like it for me. But yes, I love that. Let's go.

So. So the body kicks in. Yeah. And as this is what we're going to do, and if you keep exercising you'll maintain your muscle. But remember your external exercise is not as consistent as your internal exercise was when you were growing up.

Got it. So you have to do it consistently and you have to do this part. And often we don't do it. All right. So that's number one. Number two our environment and our nutrition affect the mitochondria.

All right. Things we don't recognize. If you have stress in your life your brain is dealing with the stress. That means there's a demand on your energetics in the brain.

That means you're asking more of the energy content outside than what it needs to do. Yeah. Yeah. If your nutrition I mean if you're eating a lot of sugary food, if you're eating, drinking a lot of alcohol.

Right. What you're doing is you're now damaging the mitochondria. Right. So, so if you now overlaid this slow and then your habits and your environment, you're trying to downgrade this.

And then if you have acute injuries or infections that makes a demand. If you have more sub chronic it makes a larger demand. If you have chronic it makes a larger continuous demand.

So all these things are circling around you to constantly decrease your bioenergetics. And the only one thing you have to replenish it is exercise. Wow.

That's so powerful. It makes me proud to be in the gym. I love that because I didn't even know. I didn't realize that there was a direct correlation between age 21 to where I am now at 35, that there's a mitochondrial loss.

Yes, that's the bioaccumulation of age related diseases. I didn't realize there's a correlated factor there. Correct. Wow. It's a rat. Oh my goodness. Fascinating.

All the mitochondria. But the manifestation is what you see is lack of muscle. Got it. Like you mentioned early on, right. That you can have cortisol or, you know, senescence or whatever, but yet those are the outcomes.

What's happening underneath is the bioenergetics component. So it's the same thing here. Don't have enough muscle mass as you grow. So you can say well I lose muscle because of aging.

Well sure. But then if you dive deeper what is it. Because it's the mitochondria not providing you the muscle

generating proteins that you need? That to keep your muscle tone because the body says, hey, if it's not exercising, why should I make the muscle?

If he doesn't need it, why make it. Okay. So it's very fascinating. It's fascinating. Yeah. What a country. And it's sensing this second by second. It knows instantly because 30s ago my hand didn't know I was going to do this.

But the moment I do it I have the energy that's allowed to do it. Yeah. Yeah. So all I'm saying this is that if by now you are not completely a mitochondria fanatic.

Let me tell you more. Let's go. If you tell me I want to get bigger muscles. I am so excited. Sundeep. Yes. I'm going to prevent age related diseases.

That's the cream of the crop. So it's net. Yeah. Yeah. And I think that if you think about this, so to our Constitution is happening every day. Correct. Yeah. Duchenne.

Yeah. Nutrition, stress, lifestyle, all kinds of things. So what happened is when I got interested in this about 2008, 2009, I saw some clinical data that just blew my mind.

And I said, look, people were ascribing that to outcomes of antioxidants. Now, intact oxidants don't do this. We were seeing are the clinicians who do the study, were seeing the effects of compound that they were studying where these leg muscles and they did biopsy of patients that they were studying who were in their 60s, after three months, was looking like the people who would be in there.

So this is muscle regeneration. You don't see that in three months. You couldn't exercise enough to do that in three months. Right. So we're seeing this and I'm going, what's going on?

So remember I just mentioned to you that exercise is the only way to regenerate more mitochondria. So I went to the the literature and said what happens.

Okay. Because remember the effect of exercise is tropic. Okay. You may be running but your brain feels good. Your you know. I mean, you generally feel good. Yeah.

And nobody will tell you that exercise is bad for you. I mean, that is one universal truth. That's true. And I guess it's a universal truth. And because it's the one thing that creates more mitochondria.

So that kind of interesting is beautiful to me. Yeah. I love that. But the question is how what happens in your body? So when I asked that question, I went around to everybody and nobody could tell me.

Said well yeah this is what happens. I said sure you will lift weight. And Michael has more muscle. Fair enough. But how did it happen. And that became my quest.

Wow. Yeah. Powerful. I have to understand what happens mechanistically. Yeah. Okay. To make your body be better, to create more mitochondria, to create more muscle, if you're weightlifting, to burn more food so you can lose weight.

What is that is happening. Well, long story short. That's what I figured out. Wow. Okay. So you found something in nature? In you. Okay. Got. That'll help unlock, recycle, create new whatever we can to have more energy potential.

Because you will make more mitochondria. Wow. Okay. Powerful happens. So remember here is exercise. And let's focus. Here is exercise. You do weightlifting and here's the muscle. Okay.

So this is the cause. This is the consequence. What connects it. Okay. And that became my scientific quest to say look I have to figure out what happens when you exercise. That makes more muscle.

So I said okay to make more muscle. You know what mitochondria exercise makes more mitochondria. How does

exercise relate to making of more mitochondria.

So let's bring the question down to that. So exercise mitochondria cause effect. And that's the connection I've been able to make.

ROS Signaling and Steroidogenesis

So what happens is that when you exercise and your body produces Ros and you've heard about Ros. Yeah. The bad guy. The bad guy. It's reactive but it's not a bad guy.

Interesting. Okay. Plot twist of is the bad guy. Okay. Some of it is a good guy. Remember, the difference between poison and potion is dose two. That water is not a bad guy yet I can kill you with it.

Oh sure. I from it. Yeah. You got a bad guy. But if we go from 21% to 29%, you won't survive. So we always have to look at the concept and really say, not defined this black and white, that Ros is bad.

Then I looked at the literature. And what you see is that people who exercise, such as yourselves, and if you take antioxidants at the same time, and if you take vitamin E, etc., vitamin C, it partially blunts your muscle muscle growth.

It does well because it's quenching the Ross. Ross at the small level is a very important intracellular signaling system. Okay. And that Ros activates enzymes in your cell particularly known as the cytochrome s.

Got it. Okay. So part that idea for a second. And I'm going to connect to this new concept I'm going to tell you that mitochondria start all your steroid synthesis.

It starts at the mitochondria. For men testosterone for women estrogen or any of your other including cortisol. Okay. So just from pregnant alone all of them.

Okay. Everything. Yep. The starts with because the mitochondria is what makes pregnant. And pregnancy alone has no pharmacology or biological activity.

But it's the mother of all steroids. It took cholesterol to pregnancy. That first happens at the mitochondria. Fascinating. Wow. Okay. Yeah. So even your cortisol production cannot happen or whatever happens.

But mitochondria started then a lot of other processes happen in the adrenal gland. Yup. Okay. To make the steroids. But the last step also happens in the mitochondria.

All right. So the mitochondria exquisitely control your steroid steroidal genesis pathway. And it's important because hormones are powerful. Signaling systems in your body cannot make it willy nilly all the time.

Correct. Yeah. So the mitochondria just remember they are also the centers of steroidal genesis. Wow. You're blowing my mind over here. Sunday. Yeah. I thought I knew a lot about mitochondria.

And here you are, taking me down the new rabbit hole. So I love it. It's awesome. And this is why I think this is such an important conversation. And I really appreciate you, you know, giving us the time to have this course.

People should understand this. So now think about this. So the first step and the very last step. Okay. Happens in the mitochondria. Now as the mitochondria go on everything happens.

When happens when you exercise. So the hypothesis I said okay, if mitochondria were to regenerate the process of making new mitochondria within the cell because you're exercising it has to do that without the cells dividing.

Got it. Okay. Because if the cells have to divide, then two daughter cells have to have the same number of mitochondria. So you will create more mitochondria because the cells are dividing.

But in this case you have to create more mitochondria without the cells dividing. All right. That's what exercise needs to do. So if there was a way to do it.

And Ros is made when you exercise. Okay. So the moment you exercise your cells make the cells that are exercising make Ros which is a signal to the cell that you need energy.

Okay. This Ros activates the two enzymes I mentioned to you in the mitochondria for steroid agenesis. Okay. Nothing in between. So if you take cholesterol and these two enzymes are activated by Ros, it produces a steroid hormone called 11 beta hydroxy preg.

Okay. Yeah. So I said okay if this could be the process. Let's look at the simplest hypothesis and see if it's true. Right. That is the signaling pathway of exercise is through a steroid.

And the steroid is made by the mitochondria because it's feeling the raw signal that there's an energy deficit in the system. Could this be the steroid. Yep.

I went to PubMed. There's nothing known about the steroid. Not a single publication. That is wild. Yeah. And it's the simplest people have studied all the other steroids but 11 beta hydroxy pregnant alone and 11 beta hydroxy progesterone which is its oxidized version have no pharmacology.

Some pharmacology people report that it is kind of, you know, tangential. So I said, oh, this is fascinating. It's interesting. So I'm a chemist. I made it and we looked at it in cells.

And I still remember that day when that data came off my. I could not walk. I could not stand still. My goodness, it was the most powerful initiator of mitochondrial biogenesis I have ever seen.

Wow. Fascinating. Okay. Yeah. So in scale of things, you understand, right. So you have nano molar which is ten to the negative nine. Yeah. A molar which is ten to the -12.

And femto molar belied that. This thing is active at the femto molar range. Golly. It is thousand times more active than cortisol. Wow. Powerful. I need some now.

My goodness. So then it started the quest. Okay, if this is this pharmacology, do the mitochondria make it? And we were able to show. Yes it makes it.

Then we said okay does it exist in living species. So we went and looked at rats and we found it. We're the first ones to ever detect this steroid in the living species.

Okay. Oh that's incredible. Then we asked, does the level go up? If you exercise? So we put the rats into a swimming tub and they swam for 30 minutes.

And sure enough, within 30 minutes, the level of this goes up. And by two hours, it's gone. So here's the connection. Mitochondria make it. It's in rats. Rats we put to exercise.

You get more of this steroid. Then we studied the steroid in diseases such as hyperglycemia neurodegeneration everything. And you can see in animal stuff it works beautifully.

And the question comes in does it exist in humans. Well I hope it does come on Sunday. Yes it does. Okay. Yes.

Discovering the Exercise-Triggered Steroid

First we couldn't find it because it only exists at the picograms level. Wow. So microscopic. So we had to develop a very sensitive method to detect it, and we were able to test it.

And we clearly see it in healthy individuals. It's higher in sedentary. It's lower because it's made on demand healthy

exercising individuals continuously put a demand on my energetics.

So the steroid levels are circulating. Now the question comes in what next. Right. Correct. So what might catalyst along the way. So remember I mentioned to you the circ that the clinical data from San Diego.

Yes. So they were what they were studying was a natural product. But they didn't know that this is what it was all about. Okay okay. Got it. Okay. So finally through our work we were able to put a context and explain what they were seeing.

And the product model catalyst is that natural product. And it comes from cacao. It's purified and it's canned cause it can come from green tea. But there's an issue here. Okay.

What does it what does the issue. So it's very safe right. Because it's you know chocolate has been a human diet for thousands of years. Green tea. Everything. Yeah. Yeah. Let's go.

What happens is that while this is all good, there is a physiological concept of harmonizes that, you know, of cellular balance. Correct? So no matter how much I exercise or you exercise, your body's phenotype is controlled by your genetic makeup.

Okay. So, so so that's what it is. And your cells know when to stop. Right. And then when to a man. Because the reason the exercise is not toxic. Because your cells will just not respond to over exercise.

You'll just stop. Okay. So what we also figured out that in cocoa and green tea, there are closely related molecules to this one. And what they do is inhibit the activity of this.

So unfortunately just eating chocolate or cocoa ain't going to do it. Got it. There's other things. The other part is that it's reasonably unstable. So the moment you process things, you tend to destroy it.

Correct. Okay. So what happens then from our further studies was that the purity is important, meaning the other ancillary congeners are not there. The dose is important because if you take too much of it, it just stops working.

It won't hurt you. It just stops working. Okay. And the idea here is that the stability you have to do it so that in the context of how you're giving it to people, it stays stable.

Okay. So so you know, you cannot just put it somewhere and hope it's stable. You have to keep to put it together in the context so it stays stable. So over the years, what we have figured out is not only how to get a very pure one, what the dose should be and how to keep it stable.

A lot of time natural products are not designed to be bioavailable. So just because you take a certain amount doesn't mean that you get the same a right amount. Yeah. Correct.

So we figured out how to formulate it so you get the right amount into it. And that's what puts this in context that says okay it's not just take something and do it.

I mean like if you get a headache you're not going to chew the bark of a willow tree to get your aspirin. Right. Correct. Right. Yeah. You got to do it wood. But most. Yeah.

Well, even if you would, I would not recommend you do it. Okay. Got you. You know, it's going to mess up my teeth and it may go down hard, you know. Or you may not just get enough or you may get other things along with it that you may not like or your body may not like.

Very true, very true. So, so the idea here is that it's a role of our modern learning, our modern science, to provide a possibility where you can take this thing.

But now the final part of the story is that, yes, a lot of us are lazy, but there are a lot of people who cannot exercise.

There are kids who have severe ataxia.

They have a lot of other issues. Yeah. So our focus is also on them. It's not that we don't want to accept. They can't. They're burdened by genetic diseases.

They're burdened by chronic diseases. They're burdened by a lot of things. So it's they got handed the short stick. And so what we also want to appreciate is that these are the people that we see very clear advantage to.

So when when they take our supplement, we already know and I've done many studies around this, we're doing another I don't know I've lost count over 811 studies in so many indications because I'm very scientifically driven that I don't want to say something unless I know that what I'm going to say, I have some background data to stand up.

Yeah. So this is where the story is that our process is that, of course, I take it.

Moto Catalyst Formulation and Accessibility

And I am a I'm a believer in it because I believe in the science that I have created, and a lot of other healthy people take it as we get older because it's of help.

But the critical focus is also on people who cannot exercise. And if exercise is the singular way to make more mitochondria naturally and they can do it, they're already behind the eight ball so poorly, then they need help.

So now we have something that is very safe. We know how to dose it. We know how to formulate it. We know how to keep it stable. And we are a public benefit corporation. Wow.

Beautiful. All right. So we are in it to make sure that our prices are not going to go up just because more people take it. We're hoping that our prices will go down as more people take it.

I love that. Very rare these days. Very. And it's important because to me, I've been in this business 38 years and, you know, I've had a fortunate career.

Many people have been successful through projects I have worked on. I have been successful. But this is so important and relevant to our society's health to to parents who have children who are, you know, have serious chronic diseases to elderly, for cognition, for late stage geriatric where they're not they're losing their ability to function.

And most of us, even if we get a bone that's broken, we lose lean muscle mass. And you can never build it. It's just so in some small part, I hope that this will help people.

That's so powerful. Sandy. Come on. Well, okay, Sandy, you got me all. I literally cued up the website because I'm about to place my first order today.

I'm so excited about it. But where do people go to find Model Catalyst? How can we start tapping into this for ourselves? How can people find you? This is fascinating.

So our website is Blue oak.com. We want to make sure that we are available for conversations. I talked to a lot of people. I'm not a clinician. I'm a scientist.

I do not give medical advice, but I can tell them 16 years of research I have done in this area. Beautiful. And I work with a lot of clinicians. We want to Michael.

The idea is to sell it through the website. Cool. Only so it's not something just take it because I don't want people to believe that this is it's a great thing, but I don't want them to believe it's a magic potion. Why?

Because even if you take this and as I mentioned, nutrition is important. So please not just take this, but also fix your nutrition percent. Yeah. Yeah, I get that.

Yeah. Yeah. So. So that's it. You can our website. There's a lot of papers. We have the clinical study papers are there. You'll see our SAB members there.

And in there there's information. If you send something we respond very quickly. And I make, make sure I do this all the time to make sure I have conversations with folks such as yourselves so that it permeates into our communities.

Yeah. So so people get to know about this. Ask questions about it. And I will say to people that, look, our price point may be a bit steep right now, but work with us.

They're a public benefit corporation will work with you. That's awesome. So we also have a button there that if your clinician says that you may need help, we will also give it to you at cost.

Okay. I mean, that's all. Nothing needed. All your clinician says that, hey, they need help. So we're trying to stay alive at the end. I will be very upfront.

It's a for profit business because, you know, to sustain charity only goes so far. Very true. Yeah. So we want to have a sustainable business that is profitable so that we can continue to serve the community, pay our salaries, pay our bonuses.

We are now selling a lot of places Eastern Europe, Europe. Yeah, Central Africa, Southeast Asia. Wow. Australia. But always with serious conversations.

Beautiful. I love that. Sandy. Well, I'm glad to partake in supporting you. Blue Oak, that's going to be quite an honor. And I feel like you're have struck the balance between the karmic bank account, which is being able to truly be a business for help.

And I'm sure our audience, whether you're a practitioner or you're a client out there, who's you tuning in to this interview amongst many beautiful minds like yourself, that we're all about supporting each other in this industry, and it's raising that conscious awareness together.

And the more we can have conversations like this with intelligent people, and the more we can innovate a process or discover something new and can bring it into our bodies to benefit ourselves.

What a beautiful way to support the creation of our being and selves. Sundeep, thank you for all the research, the time, the effort, the papers. Yeah, everybody, please check it out.

Blue Oak in Xcom. Correct. Yes. And you'll find my catalyst there and you'll see me on the website putting my order in today. And I do the same thing.

Yeah. Thank you Michael. And also with this, we're always learning. We're learning. We're getting feedback from our clinicians and stuff. And if I can take another moment, one of the things is that you may have heard about XPrize competition on Healthspan.

You may not have. So if you're not, look it up. XPrize Healthspan competition is run by the XPrize Foundation, which is looking for increasing healthspan around the globe that is accessible amenable to people around the globe.

We don't want to only improve healthspan in the U. S.

Clinical Research, XPrize, and Future Studies

or Europe. So there are a lot of other sufferings in various parts of the world, and we got selected as one of the 40 teams out of 640 globally to participate in this competition, which is a great because it is an independent validation of our science by independent judges.

Yes, it comes with money, but that's the outcome. But the fact that the science being evaluated, and I have a great team of clinicians from University of Glasgow, a Karolinska Institute and University of Colorado who are working with me to do this study in patients with metabolic to continue to understand my role catalyst in these indications.

So we continue to add to our learning in real world data, real world experience. And we're going to of there, we're going to publish. So we're investing a lot of time effort and money.

So even the money we get we're putting studies in so many places from frontal lobe dementia to Lee syndrome to, you know, mitochondrial myopathy. So, you know, we're doing all those studies at Stanford Children's Hospital Philadelphia, UC San Diego, UC Davis, Karolinska.

So what I'm trying to say is that we want to be continuously learning and providing the community what we learn, and yet try to keep this where it is amenable and accessible to people around the globe.

I love that, Sandy, but I'm gonna let us close it there. That's a beautiful way to end this, and it's awesome. Thank you so much for joining me today, Sandy.

And we appreciate everybody out there. Yeah. Thank you. All right. You too. Bye.