Introduction and Guest Background

Welcome to another episode of the Telomere Summit of the Doctor Summit. I'm your host, Doctor Joseph Rafael. I am very happy to be here today with Doctor Christopher Schade, who is going to be talking about his work over the past few decades in detoxification mercury systems.

And and then he'll get into his longevity wheel and its effect in detoxification. And we'll talk a little bit about telomere biology as well. Welcome, doctor Shane.

Thank you. Pleasure to be here. So Doctor Christopher Schade, is the founder and CEO of Quicksilver Scientific. Continues to be a driving force of development and innovation.

Doctor Shade's vast depth and breadth of knowledge, passion for healing, and intuitive understanding of chemistry and biology are reflected in Quicksilver Scientific's well-designed detoxification protocols, unique supplement delivery systems and patented mercury speciation test.

Doctor Schade is a recognized expert on mercury and liposomal delivery systems. He has lectured and trained doctors in the US and internationally on the subject of mercury, heavy metals and human detoxification system.

Doctor Shay's current focus is on the development of cutting edge lipid based delivery systems for nutraceuticals, such as liposomes and micro emulsion systems to address the growing need of high quality, affordable detoxification solutions.

Well, let me just start, as I do with many of my guests, because I'm sure you have a fascinating journey to get to where you got in this field. What what started you out in this, kind of training did you do?

And, tell us a little bit about your journey toward, to where you are now. Yeah. You know, it's kind of a funny and long journey. And I always had a lot of interest in health.

And it really began in college. I didn't think about it a whole lot. And, then I had this sort of break from, you know, what I was studying, which was, environmental science.

And, you know, I realized they were just sort of helping the polluters, and, and I took this kind of radical break, and I went into organic farming, and, I joke that I went out of business as an organic farmer the year that Whole Foods came around.

So I was a little bit early, and then I started some organic farming research. I worked for Rodale Institute, and they had this motto, healthy soil, healthy plants, healthy people, healthy soil, healthy food, healthy people.

And, you know, I was looking at it that way. And then, I went to graduate school and, I got a PhD, and I was looking at, what's called biogeochemistry, and it was mercury biogeochemistry.

So elements cycling through the environment, how they transform. You know, a lot of these are toxic elements. And here we're looking at mercury becoming a toxin, building up in the food chain in the US.

And I got my PhD and I finished some testing where different forms of mercury, where we could separate, the mercury from dental amalgams, from the mercury from fish, and look at what's compartmentalizing of the body and how it's starting to come out.

And I brought it over into integrative functional medicine, and I realized they really had no idea what they were talking about. I mean, people are doing detox and they're using key letters, but their understanding was very

unsophisticated compared to what it was in environmental science.

Now, I think this is because no money was put into, clinical mercury science, really because of all the, controversy around thimerosal in vaccines.

From Environmental Science to Mercury Detox

And so the government shoveled all this money into environmental science, and we knew everything about mercury going through phytoplankton to zooplankton to fish, where it compartmentalized what it where it goes in the cell.

And so I wanted to apply some of that and get us away from this sort of heavy handed approach to Mercury in later Mercury out to, you know, how does this cell supposed to deal with this and, and so I focused a lot on the glutathione system and how that gets turned up, the transporters, the transformations that go with it, things that link, toxins like mercury onto glutathione on how they get shuttled out of the body.

And that led me to these big gene switches and, of two and and became that work with that. And, you know, frankly, at the beginning, you know, I started coming to a forum and doing the anti-aging shows back in like 2010.

And, you know, I was a little jealous. You know, they're doing like, stem cells and, you know, telomerase activation. And all I'm doing is taking out the trash.

But the farther I got into it, you know, the farther I looked into it, the more you see that, you know, it's a very deep, deep biochemical picture when you're cleaning things up.

It's not just cleaning up environmental trash, but a lot of this is metabolic trash. You know, we're making proteins all the time. We're misfolding them. They're building up.

They're becoming inflammations. They're crowding. So and we see there's this rhythm of anabolism and catabolism. And, you know, we need to sort of link those two together so that during catabolism that's activating and decay and, and of two wants to go with it.

And we clear all that stuff out of there and we tune up our antioxidant system at the same time. And guess what? Things like telomerase are activated when the thing is high and it's highly reduced when all these and Slam engines are getting out of the cell.

So over time, I sort of built up this idea of the longevity. Well, one of the things that we have to hit this and our of to Ampk nad sirtuins, telomere attrition and telomerase activation, senescence dealing with that in the neuroendocrine system.

And we see they all go together and sort of all those paths lead back into this cellular cleanup and this maintenance of a clean redox poised in the cell.

And, you know, it really goes back to these old, you know, hundred and 200 year old ideas of a clean terrain both outside the cell and inside the cell.

And so as we go to talk about the Telomere Summit, you know, it's natural for me to talk about detox because, you know, over time, I built up my whole company around developing these nanoparticles deliveries to support that, but then also support these higher order metabolic things like the sirtuins and the energy level.

And so that's a quicksilver came to be back, you know, around 2009 ten. And we built up now over the years to, you know, making our lifestyle on this really interesting.

So let me just step back a little bit and talk about specifically Mercury and how I was, is interested to hear, because I know if you talk to the toxicologists that, you know, the state laboratories are like, well, we don't care if the

mercury levels was under 50, we're good.

Then you get the call. But then you talk about the integrative physicians who are using chelation stimulation to see whether or not, you know, you have, a mercury overload.

But what you're saying is you have a way of looking at it without having to do stimulation and then separating out methylmercury, which is organic mercury that you measure in the blood from inorganic.

Sometimes people get that confused where, you know, let's just get rid of mercury. Well, you know, maybe you have one of, what, a lot of one time, but not a lot of the other.

Tell me about tell me about what your, how you separate those out, and then we can get into how that starts to affect the body. Yeah. So we use, something called mercury speciation testing.

This is why I did my PhD on was to have one method where all the mercury forms go in, but then we chromatographic, we separate them out and measure them individually.

We do this in blood, hair and urine. So toxicology would only measure total mercury. And if you're exposed to inorganic mercury, they look to the urine.

And if you're exposed to organic mercury they look to the blood. But you know what we found? You know, once you separate these two, urinary and organic mercury should be proportionate to blood.

Inorganic mercury. And when that's not, that shows that there's some damage to the transport mechanisms that are in the proximal tubules, the kidneys.

So it's got you know, some glomerular damage in there. And that's one of the easiest places to scar up, especially when you have metals and endotoxin together.

So you got a bunch of amalgams and you got leaky gut. Maybe periodontal disease. You can really knock out the kidneys and you can build up a large amount of the blood, but a low amount in the urine.

And in fact, when people do the ki lation tests, if you have this kind of transport damage, you'll take the key later and you won't get much out in the urine.

You'll get a false negative. So that was a really nice thing to have those two independent. And then the organic or methylmercury in the blood, is related to what comes up the hair.

They should be linearly related when they're not. This one's not as direct, but it's it reflects more of a disorder in cycling related to glue to fire and liver processes.

So we've got a load of what's in the blood, a load of what's in the body, in the blood, separated into the two forms, the organic fish, the inorganic from dental amalgam and the excretion paths in here in the urine.

Now this story, it all is built up that the key later was going to show you your body burn, which you couldn't get any other way. Like the key later would go into every cell and take a representative amount and dump it all out.

So you knew what was going on? Well, that was a story that was built up because these but they don't go even into the cell. They don't cross the blood brain barrier.

They're taken proteins that are in the blood lymph soluble izing the mercury. That's protein bound into a water soluble kidney. So to perform. So they're taking what was already there but making it a lot easier to see.

So 30 years ago when they started doing this you just could measure very high in urine and blood. It was just like not sure what was. You know, it didn't relate to amalgams.

So they kind of made up these stories around there. So once we had really good analytical technology that could measure down the parts per trillion level and separate the different forms, the whole pictures right there for you.

Mercury Speciation Testing and Detox Pathways

And so that was that was the move forward that we took in the analytical and then in the treatment, it was all right, how do we get it out. Well it's up in the tissues.

It's in the cell. How do you get it out naturally. You'll then get to glutathione. So we got to get glutathione in there. We need to have the transferase that pulls the mercury off the cellular proteins and links it on to the glue.

That's I am I then phase three. So people talk about detox in phases. There's phase one, phase two, phase three, phase one or more oxidative reactions to take non-reactive things like flame retardants and some of the pesticides and herbicides, make them a bit of a radical and then link them in phase two.

All right. And that's you know, when Jeff Bland talked, it was phase one and phase two hepatic detoxification. But then phase three is like a relay race out.

And so there transmembrane transporters that, actively move this toxin conjugate out of the cell into the blood from the blood, pull it into the liver from there, dump it into the bile flow.

So all of a sudden it's like, oh, wait, we got to do all this stuff in this. So we got to dump it into the blood. Then we need delivered, harvested and coordinated with bio slow.

Because actually the toxin transporters out of the liver are ultra bile transporters. Right. So anything that blocks bile flow blocks toxin flow. So that was our movement forward to get all that harmonized.

And then make sure you have the proper binders and the GI specific ones for metals or mold toxins to catch all that and get it all out to fecal excretion.

What are those binders. So for metals we use something called IMD. That's a proprietary thyroid functionalized silica. So you know the key letters the blood more letters DMCA, DMPs.

Those will have Di files on a central carbon molecule that's negatively charged. And they'll make these complex ATP amounts. So we take these very high surface area silica particles and are covalently blind on carbon chains that terminate file groups.

So you've got just millions of files coming off every little particle. And those go through the GI. And as those metals come out with glue to iron or metallic lining into the bile, they then grab them and hold onto them so that you don't, re absorb them.

And the most famous of the re absorbing metals is methylmercury. It's got about 95% re uptake. Cadmium is got a lot of re uptake a little bit for arsenic.

So that just ensures that you take everything all the way out. So when you're talking about mold toxins and more environmental toxins, using a combination of charcoals and cow lights and titers and disasters, and allergic.

But shellfish derived. That's repeating a mean groups. It's, analogous to well call or coli starting is a little bit weaker than coli Starmie but similar to what we call so.

So you don't use any of these actual EDTA type, or for DMSO, MSG. The key leaders, the one that we use is EDTA. We do a liposomal EDTA, mercury. I mean you get four main metals, you get mercury, cadmium, arsenic, and let mercury, cadmium and arsenic are very thile reactive.

They get linked onto glutathione. Get out of the body. You can take them all out with the glutathione system.

Upregulation glutathione system upregulation will block the toxic effects of lead, but it won't export it.

And so there some EDTA is very effective. DMZ is effective there too. You know, a lot of people, you know, like, Mark Hyman's group, they'll use our system as a base, and then they'll top over.

Top of it. Little DMPs or little DMCA, or EDTA in various forms. But within our system, EDTA in a liposome is the only what are the key letters that are part of the system, and how do you follow the effectiveness of it?

Laboratory testing. Yeah. We we're we're taking testing, yes. The speciation testing before and after and, you know, making sure everybody's come down.

You know, we had do you know Neil, Nathan and, Eric. Oh. I forget the guy who worked with them. Now I forget his last name. They ran a big clinic at Santa Rosa.

They've been doing DPS calculation for 20, 30 years, and they did a whole thing comparing ours to what they're used to saying. They said it's as good or better, but the beauty of it is you're getting the body to do what it's supposed to do.

And so turning that up to this trigger of two is turning up the, intracellular formation of the antioxidant and all these molecules. So, in fact, if you're doing Killshot with the MSA or DPS, you're not getting into the intracellular stores.

The only way they can get out of the cells is through inter of two upregulation through, because within R of two comes synthesis of glutathione. We bring in liposomal glutathione.

And you just help that. But another of two is bring in synthesis of glutathione on an activation of all these enzymes to dump things into the blood. In fact, if you really strongly upregulate are of two, you'll see the blood levels come up for a little bit as the transport mechanisms clearing the blood or trying to keep up with it.

And then when you stop, it'll go down below where it was before. So at some point you need, you know, to turn up, you know, squeeze the sponge of the cells, get them into the blood.

Just for our listeners, talk a little bit about the NF, our Nrf2 system and the kinds of things you use, I guess morphine and other things like that for up regulating it.

I know how important it is. Yeah. So it out of two is a stress response trigger in the cell and it's located, in the cytoplasm and there's a pair of proteins and of two and it's held in place called something called keep one.

Keep one has the one. Keep one, keep one like it keeps it in place. And so it's got these sensitive dye files on it. I files are very sensitive to oxidative dative damage or electrophilic damage.

Elect electrophile are like reactive oxygen species in that they pull away electric electrons electro files. But that would be, any of the metals, various environmental toxins, all toxins.

And so, if you have a buildup of chemical or oxidative stress in the cell, you oxidize these die files and it releases Nrf2, and it goes into the nucleus and it activates transcription of a family of genes.

It has a promoter region called the antioxidant response element. And this family of genes includes intracellular antioxidants like glutathione, like superoxide dismutase, die reduction and all of the things that go with them, like the transferase is the transporters, different, things for cleaning up old proteins, molecular chaperons and all these clean up the cell and lead to cell survival under these stress conditions.

Now over age, just like telomeres go down, the activity of air of two goes down. So and Nrf2 is inducible meaning under stress it induces. But it also has a rhythm with which it naturally goes in and cleans up the cell.

In fact all these proteins, it used to be called housecleaning proteins before they subsumed them all within this

whole chemo protection system. And so over time, this rhythm with which it gets induced goes down.

But we can bring things into the system which induce it to turn up, transiently. And these are things like, or lipoic acid, sulforaphane, in fact, quercetin.

And we'll hit on Cristin a bunch of times in this talk because it does so many different things for us. So the general class is you've got the sulfur molecules like the sulfur vein, isotopes, elements like you get from, wasabi.

And then lipoic acid is the one I use the most. And then the polyphenols. So the polyphenols would be, like EGCg, or extract, quercetin, resveratrol and, and, and to a lesser extent, all of these have this effect.

And interestingly, you know, we think of these as antioxidants like, oh, like podcast antioxidant, great tea extract, antioxidant. They're actually little free radical generators.

But they don't have collateral damage. And they're light but effective at changing that confirmation of of keep one so that Nrf2 translocated and upregulate all these good genes.

Right. Well, that's that's a great explanation. And so you, try to upregulate the, these systems. Maybe we should talk a little bit about, your your longevity.

We'll put a protocol. Yeah, yeah.

Nrf2 Activation and Cellular Cleanup

So, you know, it kind of looks like a star, David. You know, there's these six points around it, and at the top is Nrf2, Ampk. And we're going to start there for even a couple of months.

And, like we have a program now, we call the bio age reversal program. And we, took 44 people through this program. And we did age diagnostics, epigenetic age clocks all before and after.

And we've done some sear markers as well. And, in the first month, we're focusing on Nrf2 with, glutathione on and, we used little cat's Claw to try to address some of the latent, viral activity and trying to turn up the cleaning, up of the system.

And, we do it. This you know, we do the honor of two up regulators with the, with the bio flow modulators as a dose. And it's something called liver sauce.

And so you've got traditional beer here. Yeah. No. Great. Now it's like A1 sauce for your liver. And so it's, traditional bitter compounds like gentian and myrrh and, and dandelion root, to turn to bile flow along with, these polyphenols and sulfur based, upregulated Nrf2 and Ampk.

And in the nanoparticle format that gets in and gets absorbed and peaks in the blood between 20 and 30 minutes. So it activates all this flow, couples it to bile.

And then a half hour later, we come in with a binder mix. You know, the file silica, the charcoal, the clay, the kidneys and, and carry that all away.

So we do that for a month, then we switch over to, doing the same, what we call push catch, like activate and then bind. But now it's a little bit more, Ampk focused, and we'll do that for another month and add in and a D precursors, we use nicotinamide mono nucleotide liposome and some membrane builders.

So, in this, in this, longevity wheel, the mitochondria is sort of the center of the focus and the mediators of everything are the membranes, membranes on cell membrane, the mitochondrial membranes, endoplasmic reticulum, the Golgi.

They're the communicators that talk about everything. And they get all damaged by, the reactive oxygen species toxins. And so we're moving at toxins. Then we're trying to activate.

And becae this is a big one these days, you know, I talked about it at a forum, and, David Perlmutter followed up right behind me talking about it as well.

And Ampk is pushing us into lean metabolism. It's what happens when we water fast, when we carb restrict, when we do keto diet, when we exercise, it's saying, oh, we're using up the available energy.

Let's mobilize fats and make ketones out of them. And thus we're going to mobilize fat soluble toxins. Let's mobilize like a g glucose. Let's turn up, glucose transporters and go into a lean metabolism.

And so we do that for another month and then focus another month on membranes, and nad and so this is to get the, you know, the poise of the system back really tight, you know, and it's so effective when you do these things.

In fact, just that first month protocol, we had a guy named Chang Wan use this system for looking at a fatty liver, and he got 82% resolution of fatty liver in 1 or 2 months, just doing this kind of a system.

And so I didn't interview doctor one, and I don't know. Yeah. One. Yeah. At that time he did 100 patients and he's got 800 that he's ran through this since then.

And so we're gonna get that together and publish it. So you see, you know, this ability to move in to clean metabolism and, and, you know, one of the things, you know, when the toxins go in, they'll hit the telomeres.

And there's different toxins that do that, you know, the most. And probably cadmium is the worst. Arsenic and lead right behind that. Tobacco is really renowned for that.

I think as we look more and more these, even if we look at like mold toxins, we'll find there's a lot of telomere attrition from that leading to mitochondrial dysfunction leading to cellular senescence, leading to the propagation of those spreading, the the spreading fields of inflammation that are recruiting everything else into that.

So we want to be able to, when we're choosing these compounds, be able to address that already accumulated damage. And, you know, that load of senescent cells that we have.

And in the our choice of the compounds, you know, we use a lot of question because it's a good answer of two upregulated great Ampk activator stimulates mitochondrial bias genesis.

And it's as analytic as well. And so we did find at the end of this three month period that, the beta galactose days, which is in a well, it's a marker of cells that are releasing it, meaning you're breaking down, senescent cells that the beta galactose it is had gone quite a bit up.

And then we want to follow up after we stop in a couple of months and see it come back down. So that was really exciting to. Did you make. Yeah yeah yeah yeah.

Which infinity you know and a lot of these things you know we're still working out what's ready for prime time and what's not. And you know and where are we going to measure it.

You know, what does it mean to measure it in plasma. You know, because it doesn't mean the cells are high or low, but it means something. What does it mean to measure it in red blood cells?

Do we have that assay wound up? Where should we measure Ampk? Certainly not in plasma, but maybe in the in the early days for sure. Yeah, we're definitely in the early days on that.

You mentioned training. Did you get pre and post? Yeah we did. We got print post.

The Longevity Wheel and Bio Age Reversal

We got a nice very highly significant reversal on the the new in poem algorithm, the original Horvath algorithm. And they've got another one, I think out of Yale.

They're going to run on that now. And so and that's in the early days. Okay. We move that back. What are the genes affected? Well, I don't really understand the, you know, and and so digging into these and which ones really mean something, but one of the really nice things, you know, we're in the age of, you know, immune, challenge.

And so we saw a nice reversal on natural killer cells, T cells and beta cells. And, you know, in their at least in their epigenetic profiles and, so, you know, we don't really do as well with them.

You do that, you do the intrinsic, which is the Horvath two age. And then you also the. Yes. One. Yes. Awesome. Changes in the T cell subsets based on their DNA methylation patterns.

Yeah. Yeah, yeah. Those are really nice. You know, it was bees t's, natural killer cells and, and and so, you know, with that, you know, Ampk, one of the things that, well, Nrf2 and MPK both relate heavily to immune function, glutathione levels, and specifically the amount of reduced versus oxidized are very strong modulators of immune response when glutathione goes down, you shift into like 2817 type of inflammatory activity in a way from your TH1 activity on your interferon goes way down, and then you bring the glutathione them back up and the interferon comes back.

And then with Ampk activation, you have activation of sting genes, as are interferons genes. And the process of autophagy comes with Ampk activation. And we know that more for my autophagy and and a particular ability taking, you know, old mitochondria, breaking them down so that you can make new ones.

But that autophagosome that's produced in, in autophagy and then it's linked together with a lysosome to break it down when you do that with microbes, virus, bacteria, parasites, that's called Zn off AG.

And it's allowing you break it down into subsets so that you can form the right antibodies to it. And so yeah. So these are huge elements of our immune response.

And then like glutathione its relationship to telomeres. The higher the glutathione the higher the telomerase activity. But it's not just total glutathione.

You've got to be shifted. The more reduced versus oxidized the more telomerase activity. So that all comes from glutathione synthase. Glutathione reductase, which are subsets of what's upregulated during and are off to upregulation.

So we see a lot of these things tying back together. And yes we got significant changes there. The phenotypic changes are amazing. You know I mean looking at changes in fatty liver composition, looking at changes in energy, brain clarity that come with these things.

You know, and as you said, you know, with the infinity analysis, we're just getting into what should we really be looking at with all these things and what compartment should we be looking at them.

Yeah. So the couple of studies, the term trial and Carol Fitzgerald study recently published results on, epigenetic age reversal measure change in. You have a do you have a number?

I'm just curious about. Yeah. No, I don't I you know, I just got these results back from them, from this three month trial. And so I'm going to meet with Ryan next week, and we're going to go deeper into them and, you know, and and then I got to break open all 44 people and say, oh, this guy went three years back and this guy went three months back, right?

Right. Okay. I didn't know what the how long are you done it? No, we we just got this stuff back and, you know, and

so we have to translate these into amounts of time and then we want to go to the second part, because the first part, you're kind of stirring up the pot to, I'm going to move all these fat soluble toxins out.

You know, I've got to try to get them out before they do any damage. But you got to have a little bit of back and forth going on there, and then you get into the the second, level of this and they're, you're just feeding, you know, feeding in and being, you know, light activity, feeding and feeding sirtuins, feeding neuroendocrine bringing in, pure astragalus sides, different, different high end adaptogen ginseng asides and looking to drive the whole thing forward.

So, you know, give them another six months on the nurturing side and look at them again. Now that we have that baseline data, their first, their three month intervention to clean up and and restore the terrain and then, you know, six months to build it back up and see where we go from there.

So and just in your overall protocols, what types of doses are we talking about for alpha lipoic acid and for, in and those sorts of things. I mean, I guess is there and local solar systems, it may be that they're lower than you might expect.

Yeah. Sometimes it yeah. You know, you know, you look at like when we're doing Kristen in the and of course, since you're at 40mg, you know, 40mg that you.

Yeah. And then you do the pharmacokinetic study and it's a 25 fold increase in bioavailability. So you know now you're 40 is a gram and it's happening twice a day.

And the other thing is, how much you focus it into a window, you're going up and you're peaking between 20. There's another peak at 40 minutes, and then 90 minutes.

You're out of the system. And it's these very high levels that are really in dosing. You know, these are all inducible things that are up to Ampk, sirtuins.

And so having everything focused in at once and having a bunch of overlapping ones. So in the Ampk product, you bring in quercetin, resveratrol, berberine, Silliman and dim, all hitting the same targets and different targets.

And so that's where you're really able to generate a lot of work. In fact, a lot of people, you see them go from some nutritional ketosis indicators. It's a nutritional ketosis in, you know, 30, 60 minutes because you're able to hit, and be gained from so many levels.

So you do that twice a day with binder systems when we're bringing in, and men, we're bringing in 100mg twice a day, we're looking at about we had to do Caco two studies on that because they're harder to get a good blood measurement off of, and that looked like about a fourfold increase in bioavailability.

So, you know, the inside walls tend to get larger increases versus the water soluble. You can also get more into the particles. So, you know, as we go, you know, we're refining you know, we've got I CPMs, or I mean LCMs triple quadrant here.

So we're trying to get all the, bio of, availability equivalencies. And one of the interesting things, when you get even a nanoparticles, you don't have them metabolized.

So like, un metabolized non glucagon, outdated curcumin in large amounts. And then you see the, the signature on the Dacian, come up. And a lot of these are much more biologically active before they go through that phase two metabolism.

So this is a proprietary, proprietary, liposomal, sort of formulation. Yeah, yeah, we're making it there. Liposomes or, lipid nanoparticles or nano emulsions and sometimes micro emulsions, everything sub 100 nanometers.

We make everything in-house. We've got, you know, one patent issued, nine patents pending on different forms of

this. You know, we do even things like, you know, making emulsions for Molson Coors is cannabis systems, cannabis beverages in Canada.

So we're we're putting this technology into a number of things. Always try to keep particle sizes a certain size. We have a lot of controls on that system.

Just trying to advance bioavailability so that we can get these, like, really powerful results. You know, we know what the, what the potential of these small molecules is.

You know, everybody in the research world knows that natural, small, small molecules have great potential, but bioavailability is what holds them back.

And so we get rapid and high blood levels in, and then we get the changes from those. And that's how it's able to, you know, move things like adiposity in the liver.

And you know 1 to 2 months just just getting so much. And right away at the same time you're measuring such sort of more conventional things like hemoglobin A1.

See you see kind of major changes with that. Yeah. You know, it it ironically we hadn't been tracking that all, all that much. And we just started doing our glucose tolerance tests.

And we see, you know, people coming from, you know, peaking up around 180 to stay in a 135, 140, you know, with those AP activators. So that was really nice to see.

And, you know, as we move forward in the beginning, you know, have a lot of money, you know, to do these larger trials. And now we're trying to bring in, you know, other groups and, and get larger trials going and, you know, just fill in all this data sets.

Yeah. Originally our strategy was everybody knows what the molecule does. We're just going to go in and show we get more in. And then as we grew the company have more money to throw at it.

Now we're doing these, outcome tests. But that's important. And I think the supplement industry in general is starting to, to realize that because there's starting to be overlap between pharma and the supplement industry, because natural molecules are sort of where it's at.

If you don't show that same not just pharmacokinetic data, but, but efficacy data, you're not pharmacodynamics. And yeah, the endpoints of the studies, you know that we're getting there.

Hormones, Delivery Systems, and Closing Remarks

So yeah, I'd be very excited to hear about the what the, epigenetic age reversal was. Do you do any telomere testing? We haven't yet. We we do want to start doing that.

And, you know, look at, you know, blending so different things, you know, adaptogens and the stragglers products at the same time along with all these.

And so, you know, there's various intellectual property around that. We got to be careful for sure. Yeah. So, you know, get to that. Let us do it. Well, yeah, I mean, you could you could, I guess you could put the molecule in one of your overall systems.

Yeah, that would be interesting. Yeah. Or. Yeah, I think that would. That would be a great way. Great way to go with it. You know, and I'd love to team up with them and get some of the data around that.

Yeah, because it might well be synergistic and see, I'm sure it would be synergistic and. Yeah. And that that would be helpful. Well, I mean, it's it sounds like you're on a real pathway towards a very comprehensive approach to, to

age reversal.

Let me ask you, are there any other things that you want to talk about? Tell us about that you're that you're involved in. Before we wrap it up, yeah, I mean that that about hits it, said we just we just got into hormones and that's been that's been a lot of fun.

We do. We did a female system over the counter with nano, DHEA and pregnancy alone and some modulators like crazy in the dam and some, adaptogens. And we found, you know, the nanoparticle because it it's comes in un sulfate.

It can go into testosterone like that. And so, it's been really it's been really great watching, even middle age, you know, premenopausal women and then menopausal women, you know, refilling their baskets with, with that.

And for men, we we did a nanoparticle, nanoparticle testosterone that's going out through college pharmacy and we're really excited because it transdermal, you know, it's a sublingual.

We did transdermal, progesterone works, which works great, but the sublingual will take you say you run in like 3 or 400, take 12 15mg, you'll go up through 2000 to 2500 and then come back down and come back down to baseline over about 3 or 4 hours.

And the idea is to go up, activate the androgen receptors and get down so that you stop suppressing LH and FSH so that your testicles still make the natural amount.

They're going to do all the things that they're going to do, not have the testicular atrophy. This is incredibly yeah, that's quite similar to a test.

So I guess essentially the, the nasal delivery system that, pharma. Oh, yeah. Exactly. So come in and then go way early in the. Yeah. And especially in the younger men who have had maybe TBI kids that are lowering their testosterone to give them the androgen activity without having the contraceptive effect of doing like constant sipping injections.

I'd be interested to see if you're because I mean, you know, they have mechanized progesterone and you've used to transdermal before. I'd be a sissy. Yeah, I don't know.

You would be able to speak to this more than I would. You're talking about nanoparticles. That's, I presume smaller than a micro progesterone. Could you. Yeah.

Get a, you know, a more effective progesterone at a lower dose? Yeah. We're using eight milligrams right now. It seems to be enough. And when you look at the peak.

Yeah, you look at the peak progesterone. Yeah. Yeah. In a transdermal, you know, some people will double that and stuff, but it, like, really chills you out and makes you sleep.

And when you watch stuff like there's a peak in about, 100 minutes that goes up to about, well, this in the peak, we did 20mg, it went up to about 20, I forget, is it, nanograms per deciliter, you know, grams per.

Well, yeah. It came down and then went back up and came down and then went back up. And then after about 12, 18 hours, it's back to running. You know, about one, but it goes transiently.

So we have people put it on night. It goes through some really high peaks. It really works. Well, it's truly dissolved. And it's in these nanoparticles, they're about 3040 nanometers.

You do that topically and they really run in. So we'll do that with test two. But we did the topical because they're a supplement company. We can't do a sublingual. We have a sublingual.

And there's people already been using that for changing. And Mitchell, you know, there's a guy treating intermediate cancer with it. And, the sublingual has to be gone through, pharmacy.

But the topical really blew our minds, so. Oh, I know the other reason you're using that such a low dose is because you can use up to 20mg topically, right?

I think that that's the the magic number is up to 2% and ends to be up to about 20mg, but 20mg. So people are doing 20mg every day. We're too tired. So when you're measuring this, those peak levels, is that you're using LC tandem aspect to. Yeah. Is it actual. Yeah.

We just send them in to access labs and, and okay. You send them in to access those. And we couldn't even do saliva because it blew out the. Yeah. No saliva.

That's a whole nother discussion. But yeah, yeah. Here's a blob. I'm just curious because I do a lot of hormone optimization. Of course. Whether or not you can get actual progesterone levels that high or what your metabolite profile is, because the progesterone is metabolized into many things and a lot of them are act like 17 hydroxy progesterone.

And then the sleepy component is, is the pregnant alone that you get. Yeah. And you know, so if you can do it with such a small amount of progesterone, that's really interesting.

And usually you don't get the sleepy effect when you use it topically. You more. Yeah, you get it when you use it orally. So I'm curious about that as well.

We should talk a little bit more about that. Yeah. It's yeah it's stoney and and and sleepy and it's just no doubt and everybody's like man this that's great.

So we're going to do metabolites with Frank naught. Right okay. He does 24 hour urine collection. It does all the metabolites. He doesn't dry down. So we want to find out more what was going on.

But it was really relevant blood levels you know in the in you know, for a couple hours after the dose. So, you know, we'd stopped at six and it was up at 20.

And, you know, between there and, you know, 12, 18 hours, it comes back down. So it, you could do more than once a day if you want to keep it up there.

But, you know, it really does the trick. Very, very interesting. Well, I'm glad we talked about that. It sounds like you're doing a lot of really exciting work, advancing the field.

And I've been a real pleasure talking to you about about all this stuff and and, educating our listeners about it. It does any, any stuff you want to tell our listeners about, social media or your website or anything?

Yeah. Quicksilver scientific.com go there. Doctors, get a doctor account. You'll have access to all of our educational resources. I've done so many webinars.

I do about 1.5 hour webinars. I think we have 40 or 50, online for the doctors to access. The consumers can get accounts and get, access to some of our educational material.

We do some direct to consumer on social media. There's Doctor Christopher Schade on, on Instagram. You can tell I'm that, social media guy. There's Dr.

Chris Shade, doctor Chris Shade. I do, a podcast series, and that's a website. And then Quicksilver Scientific on Facebook and Instagram to follow what we're up to.

Well, great. Well, thank you very much for taking the time to speak to us. And, look forward to seeing you at, one of

the conferences soon. Absolutely.

Thank you.