Introduction to Mercury and Toxicity

Welcome to this episode of the Reverse Alzheimer's Summit. I'm so excited to introduce you to Doctor Chris Schade. He's the founder and CEO of Quicksilver Scientific.

He specializes in the biological, environmental and analytical chemistry of mercury, other heavy metals, and even environmental toxins. You can see why I've had him here today.

You know, from my work and from the rest of the summit that I believe that toxins are one of the primary causes of neurodegenerative disease, including dementias.

And so I am so pleased to have Chris here to describe the the ins and outs, the details and the logistics of understanding to what degree this might be contributing to you or your loved ones dementia and what we can do about it. Chris, welcome.

Thank you Heather. I'm really happy to be here. I love the subject. So you you've dedicated your life. Your life's work is really helping people understand chemical metal toxicity, more toxicity as well.

And and what we can do about it. So let's start with how you got started with Mercury. Well let's start. I was born in Bethlehem. Birthplace of Jesus and me.

No different place. Bethlehem, Pennsylvania. So I was born in a steel town. I had because, you know, everybody has a sort of origin story that goes back to their own struggle, whether they know they were going down that path or not.

But, you know, I was born in this town where there was a metal rain coming down every day. And, and then I had a very generous dentist. He every time I would go in there, I would leave with silver fillings.

You know, I thought he was given me money, you know. And, when I got all 17 of them taken out, I realized. Or my dentist realized I only had one, maybe two cavities.

You know, at the time, any time you had a crack, they would dig it out a little bit. Crack in your enamel, they would dig it out and seal it with mercury.

And so I had this massive onslaught of mercury coming into me. I was super smart, young. And then in the teenage years, I filled up with Mercury. I kind of got distracted.

And, you know, I was given to bouts of of anger. And, you know, I just wasn't quite myself. And, and, you know, I look back and I look back to everything that went on in me.

And, you know, I really was building up a big load of mercury and, you know, for a mix of genetic, and other, you know, environmental reasons, I was kind of susceptible to it.

Chris Schadeu2019s Mercury Origin Story

So fast forward through, I leave school. I was doing environmental chemistry, and I leave school because I'm like, this is kind of stupid. All you do is, you know, chase after Monsanto and pretend they're not, polluting anything.

And then I became an organic farmer. And after. And I was an organic farmer. I joke that I went out of business. Your Whole Foods came around. I was a little precocious in organic farming and, I went.

I did a couple of things, and I went back to school looking at pollution, around farming, and did that for a masters

and went for BSD. And, I was gonna look more around farming and pollution.

I was out in Illinois, looking at the University of Illinois for my PhD, and then I met this guy who was smarter than all the other guys looking at pollution chemistry.

And he was doing the global biogeochemistry of Mercury. He had a global model of all the inputs and outputs and all the transformation that Mercury makes.

And he said, hey, can you design an analytical system so I can get all my own data? I'm like, sure. And so I ran down this path of designing and patenting, a specialized testing for mercury that separates different forms.

So in people, it's so you can separate the form of mercury and fish from the form that comes from the dental amalgam. Now, the form that comes to the dental amalgam is called inorganic mercury.

The one from fish is called methylmercury. Inorganic mercury in your body is from amalgam, but it's also from the breakdown product of the fish, and they excrete differently what's going on through the urine, what's going on to the stool and the hair?

They kind of partition into the body differently and I did this and I wanted to get out of environmental. I want to get into clinical work at work on people.

You know, I was an organic farmer before trying to change health by bringing a better food supply there. And then I sort of went up the intellectual ladder and I was working, you know, around toxins.

And so I spun off and started this company and, and started looking at mercury and people. And when I got over into integrative and functional medicine, and what they were doing, this is in the late 2000, it's kind of like 2007 or so.

I started dabbled in that, and I realized they had no idea what they were talking about with Mercury. It was just this, like, you're this black box and all Mercury goes into you, and you can never measure unless you do a challenge test or the key later, and you can never get it out unless you throw key liters in there.

And, I'm like, I tried that pass and it got me really sick really quick. And then I'm like, there's no way this is how it works. You know? They don't know anything about testing.

They probably don't know anything about detox. And so I started, you know, introducing this new kind of testing that doesn't use challenge tests is just look at it as it is.

And then I had to introduce a new way of detox and started down that path with a specific binder that worked really well. And then I'm like, oh, let's go to the GI of the kidneys.

And then I had to work out how to push from the cells out and bring in things like liposomal glutathione and, of two up regulators. So, you know, I came in and really upset the applecart a lot in terms of how they do testing, how they do detox made a lot of enemies just by having something new.

And, you know, then take it, you know, we're like 14 years from when I started into that. And now, you know, we're all pretty much working from this new paradigm of up regulating different processes.

And maybe we're not just going after Mercury, we're going to bring mercury mold, some other metals, some environmental toxins all at the same time. And then even further than that, we're going to be working on regenerating mitochondria and, well, removing old dead mitochondria, this deeper layer of not just take the toxin out, take the damaged parts out and rebuild them with new ones.

And the more we've gone on, the more we see these aspects of aging that are inflammatory aspects these death of the mitochondria, senescent cells, propagating waves, fields of inflammation in your body are all related together,

and the toxin can initiate that death and removal of them and maintenance of your detox system and your inner regeneration system are two sides of the same coin.

And so we can clear and regenerate within the same paradigm. It's so exciting. Is it I, you know, being in the dementia space, I didn't want to be chelating.

People, especially women, are affected by dementia and that my dementia patients are post-menopausal. And so I worry about bone health. I worry about the risks of throwing off electrolytes and the risk, of course, of putting pressure, as you alluded to, on the kidneys.

And so in I guess I was trained around the time that you started Quicksilver and I was trained that you kill it. You use yes or DMs and then you collect urine after.

And that's how you know what the total body burden of mercury is. And then fast forward six, eight years later, I had patients coming to me saying, why would I do that?

Haven't you heard of Quicksilver? I have these tests that are great, and I'm using his products and my mercury is coming down. So then a couple years later, I couldn't even get DMPs from my IB.

And then now I had colleagues saying, well, just use the Quicksilver stuff. It works just as well. It costs a fraction of as much. And it's, so much like simpler for the patient.

They don't have to come in and get IVs. They can do all of this from the comfort of their home for a very small fraction of the price, and you don't have the risks on the kidneys and those.

And so I did it. And sure enough, they were absolutely right. I patients have so much more access now because anybody who's an hour away or has to work or has childcare, all those things, they can't come in to the clinic to do an ID now they can get rid of their mercury from home.

So the I can just speak directly from experience clinically around this.

From Environmental Chemistry to Clinical Testing

And then in our clinical trial we use your test, your mercury try tests and heavy metal tests to see where everybody was at baseline. And then again after treatment in our six month clinical trial, patients with cognitive decline.

And this is, I think, instrumental to understanding the full, basically toxic burden of these of these patients, of these participants and many, many, many of them, the vast majority of them, of course.

So when when we're talking about elderly people, they have a lifetime to accumulate these toxins. And so sure enough, we were able to see that. Now, I also learned a lot from you taking doctor Reticence Recode course.

So tell me about your relationship with Doctor Rennison and how you guys have worked together to help patients with dementia. Yeah. You know, I first started working in when I was starting in detox.

You know, first it was just sort of, a lot of Lyme, chronic Lyme and just acute, mercury toxicity. Toxicity people, and a lot of chronic ones, people have been working for a long, long time.

And so those are the first ones you're dealing with. And then we went into autism them. And so here we're trying to clear out a brain. And we have these inflammatory processes in the way.

So we learned a lot there. And then a couple of years later this guy comes to me and he wants to get on a call and he's with Dale Bredesen. And, and so we're talking about his case, and he had gone he was the CEO from, the Southern California region, and he was taking eating tons of fish.

And he was having early cognitive decline. He was only 56. He had, incidentally. And this all comes together a little bit later. He had metabolic disease.

And so he had insulin resistance, high blood sugar, fatty liver, and he had anxiety and racing mind. And so he was having all those things and he went through reticence, original, whole supplementation protocol.

And it didn't move the needle at all. And somebody suggested, hey, this might be Mercury, do this Quicksilver test, you know, go to this doctor up the road and do that.

So he sent it in and sure enough, super high methylmercury levels, super high inorganic mercury levels, poor detoxification. And so Rennison was on and he's like, all right, I want to get these numbers down.

I'm going to hand him over to you. We did all this stuff. You know, you take him and, you know, give him this whole detox regimen and then I'll pick it up from there.

And so it was about, 5 to 7 month program. It was pretty intensive. It was the basis of this new deluxe detox cube that that we made. And sure enough, we brought the mercury levels way down both the methyl and the inorganic.

And oh, lo and behold, the metabolic disease was gone, too. And the early cognitive decline was done to and, you know, handed it back in reticence like, oh my God.

And that was like the big light bulb for when he saw environmental toxins are a major, major thing. This is not just all biological decay and a need for these certain supplements to, you know, prop that up.

If you don't get the trash out, you're, you're just, you know, pissing in the wind, so to speak, with all the other stuff. But if you do get the trash out, then the other stuff really takes it all the way there.

And so, that was the one that that really, that really started all this detox into the cognitive decline world. So let's talk a little bit more about Mercury, because of course, that's where you started.

But also, Mercury is extremely neurotoxic. So can you describe like why why is it that we're worried about this. Yeah. And so you'll see one when we talk.

You know, it's hard for me to convolve a lot of things. So, you know, I talked about the early mercury and then autism. So what's the defining feature of autism?

Is neuroinflammation. And, you know, that's why they get the tics. And they look so irritated all the time in their inflammation. You have a hyperactivity of the glutamate receptors.

Now drawn into it is the activation of the microglia. These immune cells in the brain that are usually for synaptic pruning all of a sudden get recruited into acting like peripheral immune cells and releasing pro-inflammatory cytokines.

And they get in this little war with the neurons where one's releasing pro-inflammatory cytokines, it's it's damaging the neurons. They're releasing these other things that damage the microglia.

And it just keeps going. It's like getting a a team from CNN and Fox News in a room, you know, like you think they'll ever stop. No. It just keeps going.

So you got to break the whole pattern. And so there was that was a big use of CBD to calm down neural inflammation. So why does that you know, why is that correlate to mercury.

So mercury is a glutamate receptor toxin. It's an excited toxin. And so it hyper activates the glutamate receptors. So they're over firing. So what is an over firing glutamate receptor. Do.

It makes you hyper glutamate dominant which makes you sympathetic dominant. And what kind of symptoms does it give you gives you anxiety anxiety and racing mind.

And then when you wear out that depression. So the cycles of anxiety and depression and the racing mind and all of that, and that's keeping you then in sympathetic dominance and sympathetic dominance is locking off your liver pathways.

And when we talk about detox, we'll see how parasympathetic rest, digest repair regenerate detoxify is the opening. And sympathetic fight or flight is the closing.

So now we're closing all of this stuff off into our body. And you know, Mercury is, you know, was shown directly to create neuro fibular fibrillation tangles.

It's shown to to, you know, just destroy, the axon of the nerve. You know, there's so much obvious damage. You know, Boyd Haley, when he worked on that, he showed metals all have an ability to disrupt various biological enzymes.

And he had all these assays for all the enzymes. And he found mercury was the one enzyme, the one metal that could block the activity of every single enzyme.

He had an assay for, you know, it was really powerful. And when you look at it in sulfur chemistry, you know, it goes and it disables thyroid oxygen reductase, it disables gluten, glutathione reductase, or glutathione peroxidase.

Sorry. And these are cellular enzymes. It goes into displaces iron from iron sulfur proteins. So then not only do the iron so for proteins not work the free iron is participating in fent reactions.

It has a 10 billion fold higher affinity for binding sites and zinc proteins. And so it kicks out zinc and disables those proteins. So there's all of this ability to disrupt all that.

And then on an energetic level, because anxiety and fatigue are your two most common, symptoms are biological level in the energy generation. Mercury, cadmium and arsenic are, disproportionately damaging to the mitochondria.

Is the whole system around antioxidants in the mitochondria is tuned towards being able to defend against respiratory bursts with reactive oxygen species and tuned away from resistance to mercury, cadmium and arsenic.

So they damage that system. And then on the thyroid level, they blocked T4 to T3 conversion. And then on a on an adrenal level, they just burn out by having new and sympathetic. They burn out the adrenal.

So they have all these ways of lowering energy and damaging the brain. So kind of have to pay attention. Yes, but definitely want to pay attention. And I think that it's really helpful for people to understand the why, because so many dentists are like, oh no, you don't need to get those amalgams out or don't worry about the fish unless you're pregnant.

And for people with aging brains, this is critical that we understand that level of mercury. Now, you mentioned cadmium, arsenic. I also want to talk about lead.

Mercury, Neuroinflammation, and Brain Damage

So it is through, you know, how those affect the brain. And you mentioned the matrix, Andrea, how those affect the system. And then again like what to do about it.

Yeah. So all of you have four major heavy metals, you know, mercury cadmium arsenic and lead. Then you've got a couple secondaries that get into the brain manganese when it's really high.

Antimony when it's really high also gets in there and then copper when it's out of balance with zinc starts being a toxin too. But if you take the big four, they all affect the brain in a similar and a similar way led to a little different.

Mercury. Cadmium and arsenic go together because they're very sort of hydro reactive, a little more so than lead. And they're also so hydro reactive for getting them out of the body.

So the glutathione system, together with metallic thiamin and the thyroid reduction system are all pulling stuff out and within the cell buffering. So this is an important little side note.

When you upregulate the glutathione system yeah you're dragging things out. But at is cellular level you're creating resistance to the metals. So even if you never even get rid of the metals, your cells can deal with them being around.

So that system is always protecting and pushing the metals out of the cell. You know, if you're in a cell here, you have that upregulated. You're pushing away, pushing away, pushing away.

And these are the two parts of detox. You push out of the cell into circulation. And then you drain from circulation with liver to gi to stool and through the kidneys and also some through the skin, that we don't know the mechanism as much.

So when we upregulate the glutathione system, we have an enhanced protective mechanism. And it's that same system that the metals are attacking. So you're waiting to see who gets on top.

But once the metals get on top, you start losing. And so you always want to support that system so that the cells and the brain cells, all the cells can be pushing away.

But when you do support that system, you're also supporting export from the body. Now you do have to bring in a little bit of liver support. You have to make sure bile flow is moving because the toxins move on.

Bile transporters in the green River of the bile from the liver to the GI. And if that's blocked, you can't get anything out. And before we go back, how does that get blocked?

Well there's feedback. It gets blocked from inflammation. And we'll talk about inflammation being the fundamental opposite to detoxification. Inflammation blocks it.

But just being in sympathetic dominance blocks it. And on the hormone level being in in estrogen dominance blocks. This becomes a huge thing for the postmenopausal women.

And perimenopausal women. They're all in a bit of an estrogen dominance. And estrogen makes glutamate receptors hyper fire and it blocks bile flow. So it's taking that access and blocks it.

Whereas the opposite is progesterone. Progesterone makes Gaba activity, which makes you more parasympathetic. And it's bitter and it activates bile flow.

And further in the hormone world for NRF two to be up and constantly up regulating detoxification glutathione system activity, it needs a cofactor, or so it's called a nuclear transcription factor.

And there's another one that goes with it, called the XR or pregnant X receptors that responds to prenatal alarm and progesterone. So as hormones go down, I mean, I said the beginning, you know, I had these chronic mercury toxicity people, the line people.

And I had the menopausal women all like, God, these amalgams are no problem. And now I have all the mercury symptoms. Why is that? Because the hormones are declining.

And so all this stuff sort of whines together into this whole package. I'm so glad you're pulling these pieces

together, right? Because we know that dementia is a complex breakdown of the of the neurological system.

Right. And so there's a stress component. There is a toxic component. There's a nutrient component. There's a hormonal component. And we know that we need to put all these things back together.

And what you're describing is a lot of that complex interaction and why it's so essential, and also why the pharmaceutical companies can't come up with something that's going to really, really help us.

Right? Because they don't appreciate the complexity of so one hit wonders, you know, and you can't hit all these pads with a one hit wonder. No, we need we need a solution that matches the complexity of the problem.

And so I so appreciate you. So we can start now with glutathione. And I think the other thing that was really important that you brought to light here is why some people don't tolerate good at that.

So your products, what I've seen over and over again is I have to like, be the person that pulls the reins back and, like, slows everyone down because your products work really, really well.

Which means sometimes people are getting toxins out faster than they can tolerate it. So they're pushing more than they're catching and eliminating. So talk us through how people can avoid that, how they can, you know, what do you do?

I usually start low, go slow. But but tell me what advice you give to people and to providers. Yeah. So if you look at the whole throw the whole relay race out the cell, you have glutathione processes going on in there and pushing, pushing out, pushing the toxins out into circulation.

And in fact, if you give a lot of glutathione, and a lot of nerve to a regulator like lipoic acid or sulforaphane, but you're not doing the next phases, you'll see the blood levels go up, and that's the tissues going into the blood.

The tissues always have a lot more than the blood. So you have compartments. You have the tissue compartment, the blood compartment, and then the drainage compartment, which is the liver and the kidneys out in the stool and urine.

So you thrown into the blood, you're bringing that up. You need deliver the upregulate, pull those out and dump them into the bio, which means you need high bile flow.

And for high bile flow you're going to use like traditional bitters. Now we have this push detox system. We have the liver source, which pushes the the toxins to the blood and upregulate bile flow.

And it's got within it. This, bile mixture called Bittrex. It's a traditional bitters. This is why bitters were like the cure all at the turn of the 1900s.

Because, you know, open up people's biofilm that just so much is digestion, is detox. You know, it's cycling of everything. It's balancing everything.

So you have to couple the movement there into the blood with the movement through the bile. So you need to upregulate biofilm. You might use 2 to 4 Urso deoxy coli.

You you even use manual methods to push things down. Hormones. Progesterone is wonderful for that.

Heavy Metals, Detox Pathways, and Bile Flow

So it's either bitter compounds or bile salts or hormones to get that flow going. And then you got another problem. Once you get down there re absorption.

That means you need a binder to catch all that stuff down there. And the binders you're looking at charcoal

zeolites. Chlorella was an old school one and Chlorella was was great for metals because it had these sort of hydro groups on it, like glutathione like groups, but even more powerful.

And so we we made this product. This is how we got into this was the number one product. It was called IMD. And it was these silica particles with sulfur hydro groups on them.

Tons of sulfide kills. You know, it was like one little tiny 100 milligram teaspoon of this was equivalent to 70 or maybe it was 90 Chlorella. I mean, it was like so many.

And so you need those so that when the metals come out of the bile, they stick to something that you can't reabsorb or that if it's mold toxins you're looking at, charcoal is really good.

Zeolites and clays are good for some of those cases. And it's a natural. That's a molecular mimic of well call well called Cauley Stein amine or what you use for pharmaceuticals.

So those are you need some cocktail binders picking up everything. In the beginning all we used was this metal binder. Now we mix the metal binder with the everything binders so we can get everything there.

So you got a push from the blood and then you got to match that with the movement through the liver and into the GI. And there's slightly different genes. They're both called MSPs.

But the one that dumps from the from the cell to the blood and the one that dumps from the liver to the bile may have different snips on them. And so if the liver, the bile snip is a little slow or if you've got inflammation, fatty liver endotoxin in the liver, it's going to move a little slow.

And so if the cells faster than the liver the blood levels go up. If the liver is faster than the cell, the blood levels go down. But you're going to feel that symptomatically if you're getting, you know, wound up a little bit of brain fog and, you know, fatigue, anxiety, you know, any symptom, any symptomatic stuff means that the blood compartments going up faster than is being drained.

So that means you have to lay heavily on the bitters and the binding side. So slow down. Like the lipoic acid, the sulforaphane. Those are the things that push when they're slow down the blue, the time, that's all supporting the cell levels and turn up drainage.

Oh, another one for bile drainage, I forgot that. So this is really essential one, especially from all time for Alzheimer's. And any neurological stuff is versatile calling.

Thank you I yes I I'm so glad to hear you say that. And now for bile. So I think of that more orally. So oral PC and then for kind of cellular re like rebirth I think of I've asked Dr.

Colon, but tell me, you tell me more about how you guys use it and where you put it into the mix. No, I mean it, though. All of the reason PC is in there, why it's important for the bile flow.

One of the transporters, out of the cell on the channel, ocular or bile drainage side. So you've got a couple. You've got the MRP two, which moves bile salts and toxins.

You've got Baeza bile salt export particles by bile alone, and then MDR Mus positive colon. And the fastest colon is thinning out the bile so you don't get sludge.

Bile, jam up the system. And bile is a very detergent thing. It's there to be a detergent on your fats. Right. So it's also blending with the bile and mixed micelles so it doesn't dissolve the endothelium of the bile.

Track. And it's being donated from the hepatocytes all the time from the membranes in the hepatocytes. So when you run out of either choline or facet IL choline, you're going to lock up the bio flow and hold the toxins in.

So you need to get it in and it's coming in from the blood. So I will go there too. If you look back to, lipase to do you remember lipase tubule in a sense, yeah.

No, no, those were, those are used heavily. Klinghoffer used a lot of those is really wild, integrative guys. In the 90s and 2000. The PK protocol was based on on that.

Well, it wasn't just fast little coli. And incidentally, that that was made, but, you'll come back to me. It's, Division of lipid in Germany that does all the injectables.

And it was injectable faster colon. That's where we get our same injectables division. And using, it what's at the end essential. Yeah. Yes. The essential was not just fast growing.

It was fast choline and, sodium percolate. It was a biofuel. Bile salts stimulate bile flow and they stimulate activation of Ampk. Ampk moves, it increases candela killer trafficking, which is moving across the can liqueurs.

It also increases lipolysis of burning off of fat soluble. So the PCA injectable used to I mean people would say, oh my God, I did a PCV. I had to stop on the way home, you know, and I pooped green.

So the injectable is going through the liver, an increase in bile flow, any ways that you get it in there. So we use, these small liposomes to my cell size, for a little choline, either pure PC or here's a blended, PC and RV flour, which is a mega three with us, the Zanten and Toco trainers, which are your best fat soluble antioxidants.

So bringing in some source of PC. Now that's an oral. But it's you know, it's in these little. So, liposome micelles, capsules, a PC in the internal sites, you actually have to break them into fatty acids and coli and bring them in and then rebuild them.

So it is a, you know, great source of precursor juice, and it all does eventually go in. It just doesn't pick up in the blood. And when you peak in the blood, just like with the injectables, you stimulate that bile flow.

The low and slow is more building slowly. All the membranes, the mitochondria, you know, more choline for a seat of choline and the brain, whereas the rapid ones are actually stimulating more on the bile flow side, but they're also the rapid ones also get across the blood brain barrier more so every time I talk to you, I end up swallowing handfuls of supplements right afterwards.

I was inspired to get all of these processes going. So let's segue into environmental toxins. So these are the types of like petrochemicals, parabens, PCBs.

You mentioned organic farming. And so pesticides, herbicides especially glyphosate. Tell us what you've learned over the years about testing both testing for them and then getting them out.

Yeah. So as we sort of our first detox stuff is more mercury specific, you know what the blue thing in there and then the binders specifically for heavy metals, but it's still had this broad thing whenever you do Nrf2 upregulation.

And for definition, Nrf2 is a nuclear transcription factor. It's a protein that's outside the nucleus, and it's held in place by a protein called keep one.

And when hermetic stressors strike it, it's a stress response thing. Free radicals, electrophile, which is a fancy name for environmental toxins.

Environmental Toxins and Broad-Spectrum Detox

They strike that and they strike actually keep one and they release Nrf2 to go into the nucleus and it up regulates transcription of all the chemo protective genes.

These are genes for antioxidant activity like blue diamonds, superoxide dismutase with their corresponding

enzymes glutathione peroxide, ascorbic peroxide and the reductase is that keep them cycling.

You know, quenching free radicals and come back in coming back in like little time reductase, fixing protein damage with gluten reduction and thyroid toxin, and activating detox with the Bluetooth Ioannis transferase in the transporters, UDP group, urine acyl transferase, sulfur transferase, all this whole family and any of these toxins, you're going to have to go through some mixture of phase one, phase two, phase three, the transport out.

Phase two is the conjugation. Phase one is this activation. Certain compounds needed. Certain compounds don't. But they're all upregulated. When you do Nrf2 upregulation.

And so doing this instead of just going in with like DAMPs does, one thing really only is go for the metals and make it PMA, push them into the kidneys, possibly damage the kidneys.

Joe Mercola has a whole story about this. Blew out his credit and clearance doing all that DMPs, you know, for years he's just crawling back and getting that regenerated.

You know, 30 years later. So when you do enter of two upregulation, you get, more. And then as we went, we got deeper within our of two upregulation. We got deeper into AMP k.

AMP k is what we get when we do fasting keto diet carb restriction which makes us turn up like well it makes us reach for more energy. And that's mobilizing glycogen for more glucose increasing glucose transporters, decreasing insulin resistance, increasing sensitivity, and mobilizing fat to make ketones.

And when you mobilize fat, you mobilize and other toxins and more. You know, I don't know what's most important, but very importantly, activating autophagy.

So you go in and you take damaged mitochondria and you break them down and you turn them into fats and amino acids. You reuse those. And then the flip side later we'll talk about is regenerate them through mitochondrial biogenesis.

But this, you know, bringing both of these Ampk and that are of two together. Why. Well, not just because one's getting environmental toxins and one's taking bad parts and turning up fat soluble momentum.

But when Ampk is high enough to, it's easier to rise to the surface. It up regulates more. And the two of those are clearing all this junk out of your system.

And so the more we brought all that together and then increased the breadth of our binders and, and coupled together Nrf2 amp gate and bile flow, once you get all that going at the same time, you have a much more efficient way to get out, and you're pulling all the different environmental toxins at once.

And you don't have to be more like laser shooting. I mean, I hit the metals now I'm going to hit the ball. Now I'm going to hit the petrochemicals. You're bringing all of them down.

And so you can go ahead. You can do testing like environmental testing at Great Plains Lab. You'll see a number of different petrochemicals in there. Petrochemical derivatives, mold testing, bit of a crapshoot.

A lot of people just look for the markers that the mold is in there. But even if you don't test, you're pulling all of these things out. I mean, it's nice to know, be able to cut off the sources, but of the, you know, let's just say there's 10,000 toxins out there.

Let's just say there's a thousand, because tens overwhelming and through. Sounds like the 10,000 year old egg. We can you test for, you know, 30, 40. You know, it's like you're always going to miss something.

So, you know, if you have the money, test for as much as possible so you can remove yourself from different exposures. But there's a soup of toxins out there.

And the more holistic your detox is, the more you're going to drain all these things out. Right. And then once you've drained them out, they've done some damage, like you mentioned Jim McCollum, what was going on there.

And so when we can measure this is also nice because we can kind of see when we're quote unquote done. But as you mentioned we live in a toxic state. So we want to have some maintenance space detox support going forever.

And we can do this through diet and sweating and keeping our gut moving. And through all of breathwork, there's lots of different ways to naturally enhance detoxification without even having to take a single pill.

But then, probably because of the world we live in, we want to use a little extra support and we want to shift focus when we get to a certain stage towards regeneration and healing.

The damage that was caused by the toxins. So tell us about how you guys do that at Quiksilver. Yeah. So, you know, to speak a little bit to the long term and to the regeneration long term.

You know, if you're in corporate, in bitters, in your encouraging bio flow all the time, and taurine is another thing for, for bio flow, encouraging that bio flow is it's always going to help that.

And PC encourages bio flow and is a constant regeneration. I mean, one of the things that Ed Kane, one of the original PC therapy, you know, you know, Patty Kane for the PK protocol.

But you know, the real mind there was Ed Kane and, you know, he would talk about how fast alkaline, you know, make cell cultures live almost indefinitely of you always replacing the phospholipids.

And so that's a long term therapy that you could do along with bitters. Now back to the regeneration fast. Colleen is going to limit it's going to be doing bio flow.

A lot of the damage along the way is to membrane. So it's going to be constantly repairing membranes. And if you you know, have some of these high end membrane bound antioxidants like in a thigh and as the Zanten, the different, you know, Lutyens is and then lycopene, and took a train all the higher.

Those are going to help a lot with the PC. But then we need to turn up to inactivation. And central to that is an add levels. All right. So NAD levels are crucial for anti-aging.

So we know about sirtuins. Let's talk about an Ampk which we talked about for starting this. You know what policies and autophagy. Well, that's beginning this clarification of your metabolism.

But then that's going to also enable sirtuin activation.

Regeneration, NAD, and Mitochondrial Repair

A lot of the things will do both, but you have to have enough NAD for certain activation. So sirtuins get activated when there's enough oxidized NAD, you know, what is certains do so Chileans are codifying you into they're bringing up a lot of these what we call anti-aging genes, and anti-aging proteins.

So show tunes in the fox host their deacetylase is that take a lot of proteins into this active, phase. And these are proteins that stimulate a longer life.

There's sort of, dietary restriction, memetics, the you know, when you're dietary, you know, calorie restricted, you move into this more pure phase where you lower inflammation, you're working on your bodily fat, you're not accumulating, you're keeping very clean metabolism.

Because, remember, way back in the ice age, we were programed to Ohmygod foods here. We actually inflame when there's a lot of food. And that helps us have insulin resistance and helps us build on fat.

And when the sirtuins and the Ampk are there, then you you go out of inflammation and you stop accumulating fat, and you go more to burning very cleanly.

We want to be on that side to reach a healthy old age. I mean, think I mean, I mean, you must have taught in this a lot about type three diabetes, which is insulin resistance in the brain.

So as long as we're ever on this sirtuin NAD Ampk side, you're going to be keeping your NAD pools on the oxidized side, you're going to keep your sirtuins active, you're going to keep inflammation low, and you're going to burn clean, and you're going to live longer and better.

And so, so two and activators like, you know, resveratrol, quercetin. Terry's still been, curcumin to help with both tunes and keeping the inflammation low and keeping NAD levels up with either nicotinamide mana nucleotide or nicotinamide ribose side.

That is key. And we talked about when mitochondria are bad, when mitochondria are bad, they it's first it's a membrane potential that they lose. So the membranes get damaged.

And that's why they're not they're making free radicals more than ATP. And they may have been damaged by toxins all kinds of things. And so they sit there just kind of like spreading inflammation.

And if you get too many of them, then the cell goes into senescence, it stops growing. So you want to get rid of those. And so it's the process of autophagy that's getting rid of them.

And how do you know the good ones and the bad ones. You get markers that accumulate on the bad membranes. And you take them out of them. You break them down into raw materials.

You reuse the raw materials. But the flip side is mitochondrial biogenesis, rebuilding more mitochondria and hopefully getting to more mitochondrial density that is sure to inactivate it.

So you have to have the need to activate the tunes to rebuild more mitochondria. So all this stuff goes together. But the phospholipids, the NAD and the sirtuin activators is the regeneration and keeping the system humming.

Excellent and so critical to brain health, clearly. So because I want to make sure that everybody knows how to find out more about Quicksilver, more about you.

I always learn so much, and I know that you guys have a ton of educational materials on your website, and out there for both providers who are listening, and then also for, for patients.

So let us know how we can find out more. Yeah. Go to Quicksilver scientific.com and get yourself a practitioner account. Sign up, throw in you know send in your license.

Quicksilver Resources and Closing Remarks

And that enables you to get into the practitioner portal. And in there is all our education resources. You know, of course there's technical sheets on all of the different products.

There's technical sheets and protocols. Here's how we line up products. And importantly for education. There's all of my webinars. I do hour and a half webinars, I don't know, there's 30, 40, there's, you know, presentations I've given at a forum, autism one.

There's just tons and tons of material in there. And there you can get into, account reps and that can put you with our clinical team. You know, we only have a couple, so we're really just disseminating educational information.

We have a clinical team that can answer questions. And there's just you can just dig in and eventually all this all come together and be like, it's not a million supplements.

There's a couple of concepts, and you can hit that, you know, with a lot of different supplements, to open up, you know, all these pathways and then support the regeneration.

And once you see all that, then, you know, you're going to have low compliance people. You're going have high compliance people, you know, okay, you got the mango protocol over here.

You you got three things. And you know, once you understand all that you can on the fly, make adjustments for your different clients, individual license and the women's needed.

Phenomenal. Thank you so, so much for joining us. And also, thank you for just doing this work in the world and making this accessible to, practitioners so that they understand what's going on and then also making this all accessible to, to patients, most importantly, so that they can see the benefits and, and, you know, live their healthier, more optimal lives.

So appreciated. Well, thank you. I'm blessed to be able to do it.