Transcript: #466 Heavy Metals, Ionic Mimicry, and Hair Tissue Mineral Analysis with Clark Engelbert

Dr. Wendy Myers: Hi everyone. I'm Dr. Wendy Myer. Welcome to the Meyers Detox Podcast. We have a great show for you today. It's my really good friend Clark Engelbert, and I've known him for almost a decade. We were friends on Facebook, and we'd chat about hair mineral analysis and heavy metals here and there and bounce ideas off each other. And so I'm really happy that he's really taken his research on heavy metals, too, to the next level and is here to discuss a lot of different topics with us related to that. And so we're going to be talking about mineral deficiencies and how those cause heavy metals to accumulate. That's one of the reasons we accumulate heavy metals and become toxic. We also talk about how you can become mineral toxic. Certain minerals can build up to levels that cause problems in our bodies, much like heavy metals.

And we talk about how heavy metals are persistent in our environment. They never break down; our bodies can't break them down. It's similar to forever chemicals. There's a lot of hoopla and panic on the internet and in the news about forever chemicals. But heavy metals are also forever chemicals. They don't break down. They persist in our soils, in our food, in our water, in the air, and then in our bodies. So they're very, very problematic. And Clark also breaks down how heavy metals affect us. And he goes into his own personal store and different heavy metals he had and what happened when he eliminated them, how much better he feels. Now, we also talk about hair mineral analysis. Is it a valid testing tool? What are some of the issues with hair mineral analysis, and how accurate is hair mineral analysis?

There are a lot of really interesting concepts that we're going to talk about today on the show, and most importantly, why do you need to detox? Why it's so, so important to be healthy today is because of what the research it's showing about what heavy metals do to our body and to our health and our mental health as well. And I know you guys listening to this show you're worried about

detoxing your body. That's why you're listening. But one thing that's important to remember also is that our emotional trauma also causes many different health issues. The research shows that emotional trauma is responsible for 65% of physical health issues. This is what conventional medical research done by Kaiser Permanente is showing. And there's so much research to support this as well. And so if you want to be at your best, yes, you need to detox heavy metals and chemicals, but you also have to address your emotional trauma.

And this has been a personal passion of mine. After I totally detoxed my body and got myself to a very clean level, I still felt like there was just another level that I could go to with my mental health and with my physical health. And so, I did a lot of research, and I have a free masterclass you can take on this. That's fascinating. It's totally worth your time. Go check it out at emo-detox.com, emo-detox.com. Check it out. I talk about all these five pillars of mental health. I talk a lot about how sound therapy can be used to release emotional trauma from your body. I talk about all these different methods to release emotional trauma, and that little piece of the puzzle is so, so important. So check it out. So our guest, Clark Engelberg, received his diploma in hair analysis certification through Westbrook University in West Virginia.

And this is a program through Dr. Lawrence Wilson, who's a pioneer in the field of hair mineral analysis. From 2003 to the end of 2004, Clark studied nutritional sciences at the University of Arizona. And in 2016, he re-enrolled at Boise State University to further educate himself in health sciences with a biochemistry emphasis, where he studied until 2017. And in 2018, he started his business, nutritional analytics, which specializes in utilizing hair analysis or hair tissue mineral analysis to assess minerals, and heavy metals in the overall biochemistry of the body. And since starting his business, he's helped hundreds of people to regain good health and detoxify their heavy metal burden while analyzing close to 1,000 hair mineral analysis tests. You can learn more about Clark and his work at nutritionalanalytics.com. Clark, thanks for joining us on the show.

Clark Engelbert: Thank you so much for having me, Wendy. It's a pleasure.

Dr. Wendy Myers: Yeah. Yeah, I've known you for so long on Facebook. We've known in Facebook-

Clark Engelbert: Yeah. We've known each other for a while. Yeah.

Dr. Wendy Myers: It has to be coming up on 10 years maybe?

Clark Engelbert: Yeah, I think it's.

Dr. Wendy Myers: Yeah. Yeah.

Clark Engelbert: That's basically, yeah. Yeah.

Dr. Wendy Myers: Yeah. So we followed each other's work and each other's detox journeys. And because you practice using a hair tissue mineral analysis. And I do. And you've been on a program to detox yourself for a really long time. And we've exchanged notes sometimes and followed each other's work. So it's been great to see you develop your practice and you are now involved in heavy metals research.

Clark Engelbert: Right.

Dr. Wendy Myers: So tell us a little bit about your journey and why you're so passionate about detox.

Clark Engelbert: Yeah. So all of this started for me. I got into the alternative health space around 03/2010. I started to have issues in my early 20s. I'm 37 now. I started to have issues in my early 20s with anxiety, depression, and panic attacks. I was burning the candle at both ends as a young person, a young dude in college who was drinking a lot with friends and working 40 hours a week. And I had a full load at school. So that basically resulted in me having some serious anxiety attacks around that time. And I went through the medical system, and they really didn't have any answers for me. It was really pretty bad, actually. It messed with my mental state to a significant degree. I started to have these anxiety attacks.

I would go to the emergency room multiple times. They sort of knew me on a first-name basis at that point. And I never really got any good answers on what was going on. And I didn't really have any notion of what anxiety was at that point, what panic attacks were, or any of that stuff. I had been pretty well-adjusted up to that point. I was just sort of running myself into the ground. And so I went through the medical system, I went to my PCP, I went to a bunch of different MDs, tried to figure out what was going on, and no one could give me any answers. And eventually, I ended up on a couple drugs and medications for anxiety and depression in and around 2007-ish 2008.

And those medications were really helpful in the beginning in dealing with the anxiety and panic attacks that I was having. But within a year of taking those medications, I started to notice interdose withdrawal symptoms. And I was on Celexa and SSRI and Klonopin, a benzodiazepine. So I started having pretty bad interdose withdrawal symptoms, and I realized that the medications were actually making me much worse. So that sort of started me on this path, like 2008, 2009, of trying to figure out some of the underlying reasons why I felt the way that I did and why the medications weren't working. So I got into the alternative health space. I read Pam Killeen's book and Pam was actually my first nutritional balancing practitioner. Still good friends with Pam. She's amazing.

Dr. Wendy Myers: Yeah. She's been on the podcast before, too.

Clark Engelbert: Yeah. Yeah. I think I've watched those, for sure. So, Pam, I read her book, a couple other books, this book called Depression Free Naturally, by Joan Matthews-Larson, other books by Julia Ross, The Mood Cure, The Diet Cure. And

I went to a bunch of different clinics to try and solve these issues, and eventually, I had to deal with the consequences of being on those medications for so long. So I had to take them off. And I came off them around 2012 after trying many, many times to come off them. And it was not a fun experience. Coming off them with withdrawal, especially from the benzo, was pretty significant. Not only in the short-term time horizon, but the acute withdrawal effects were also really bad. But there's this thing that they call post-acute withdrawal, in which withdrawal from that medication can last for up to two years.

Dr. Wendy Myers: Mm-hmm. Yeah.

Clark Engelbert: So after that, I went up to Joan Matthews-Larson's Clinic to come off of the medications. And that's where I discovered nutritional balancing and mineral balancing. I remembered reading Pam's book, and there's a little piece about mineral balancing towards the end of her book, which is Addiction: The Hidden Epidemic. And someone had mentioned to me about hair testing at the facility that I was at to come off with the medications. And so I put two and two together, and I was like, "Oh, I'll email Pam and see what this is." So that was late 2012, 2013. And that's when I got on a mineral balancing program. And nothing else had worked that program once I got on it.

Dr. Wendy Myers: Yeah.

Clark Engelbert: So I started, yeah, late 2012, 2013 and have been doing it, been on a program since then. So about 10 years now. And along the way went through many different metal eliminations. I was dealing with not only the withdrawal effects from the medicines but I had pretty bad gluten and dairy intolerance that I developed while I had those panic attacks in the beginning. So I had tolerated gluten and dairy in most foods for all of my life until that period of time. So I thought that was definitely very weird. But as a result of being on the medications, I ended up hypothyroid.

I had really high blood sugar, and I was super overweight. I was like 270 pounds. I'm six-two, but I sit at 200 pounds now; that's a good weight for me. But I had a lot and just so many different other things layered on top of the anxiety. And so once I got on a mineral balancing program and started to eliminate metals, I just started to notice dramatic improvements in all of those parameters. And so it took me a good four years, five years on that program; I eliminated a bunch of nickel and noticed my suicidal thoughts went away, just disappeared, went through some big copper and lead eliminations, and my anxiety went away. When you have lead toxicity, and you eliminate lead, you can almost feel like you're stimulated at this low level chronically. Your stress hormones are chronically elevated. That went away. The insomnia went away. The high blood pressure went away.

So, yeah. So a couple years ago, I went back to school. I went to school at the University of Arizona for nutritional sciences, and then I went back to school here at Boise State for biochemistry because I was inspired to do this work. And after that, I started this business, nutritional analytics, which is basically a mineral balancing business in that we use the hair tissue mineral analysis as sort of the baseline diagnostic to assess people's biochemistry and then engage in mineral balancing, and the mineral balancing, the idea is that that triggers detoxification of the metals and that's where people start to heal.

Dr. Wendy Myers: Yeah. And it's an amazing screening tool; hair mineral, HTMA, or Hair Mineral Analysis as a great screening tool for heavy metals and minerals.

Clark Engelbert: Yes.

Dr. Wendy Myers: And talk to us about why it's important to look at your minerals and to test for your minerals and heavy metals using a hair mineral analysis?

Clark Engelbert: Yeah. So I feel like, with the minerals, there are a couple facts about them that maybe people have glossed over or don't fully appreciate, which is that minerals are operating at this atomic level where if you think about what they are, they're simply different configurations of electrons and protons. They sit on the periodic table and have different chemical characteristics, right? But at the most basic level, minerals are operating at this atomic level where we often think about the body in terms of this organizational or hierarchical approach where we're trying to figure out what's at the most foundational level of your biochemistry. And people think of DNA as the final boss in that regard. But if you think about what DNA is, DNA, at the most basic level, is made of nitrogen, sugar molecules, and phosphorus. And so, phosphorus is an essential element. So even DNA is made of these essential elements. So minerals, it's almost like minerals are operating on a very elemental level, even sort of below the level of DNA.

And so they're operating at this atomic level, and you could think of them as a quantum in nature where the light water and magnetism folks talk about this quite a bit in terms of light. Light is quantum, Jack Crews and those folks, and I have a ton of respect for those guys, but minerals are operating on that same level. And so that's the first thing about minerals. They're really at the most foundational level of your biochemistry. And there are a couple other ways that you can think about minerals. Minerals are also what I like to call pleiotropic, meaning to borrow a term from genetics; minerals are used for hundreds and sometimes even thousands of different functions in your body. So we know that magnesium everyone knows that magnesium is used for hundreds of different enzymes. Same thing with iron. Zinc is used 2,000 to 3,000 different times for different functions, right? And if we were to list everything that zinc does, we could easily take up two hours, right? And so minerals are not only atomic and operating at that foundational level, but they're used across every conceivable system and organ in your body.

Dr. Wendy Myers: Yeah. And I think that's why people have all these different health issues going on, and they don't-

Clark Engelbert: Exactly.

Dr. Wendy Myers: Focus on minerals. We need minerals, the most basic thing that you can do-

Clark Engelbert: Exactly.

Dr. Wendy Myers: To improve your health. And that's why people start hair mineral analysis. They start taking all these minerals and the right ones that they need.

Clark Engelbert: Right.

Dr. Wendy Myers: And their health improves so much or their sleep or whatever's going on with them. And it's just sometimes you just have to get back to basics.

Clark Engelbert: Yeah, you really do. That's a really important point that you're making that the implications of the pleiotropic concept are that when one mineral gets out of balance, 10 or 20 or 30 different things can go wrong as a result of that one imbalance. And this explains why when people come to me, or I'm sure when they work with you, they never come to you with just one problem. It's always like, "I've got digestive issues. I have issues with insomnia or mental health problems." And to give a concrete example, zinc is used by the pancreas to extend the action of insulin to synthesize digestive enzymes for GABA in the brain as a GABA agonist. So when zinc gets low or becomes imbalanced against other minerals, you can end up developing symptoms related to insulin dysregulation. Low testosterone in men is very, very common because zinc is used for testosterone, but then digestive issues and mental health issues as well. So-

Dr. Wendy Myers: Yeah. I mean, it's not a surprise that there are a lot of men that have low testosterone, and their doctors have been telling them for years, "Don't eat red meat because of heart disease," there are so many people cutting out red meat-

Clark Engelbert: Right.

Dr. Wendy Myers: Which is the most highly absorbable form of zinc, and there's a huge consequence in feminizing men and lower sperm counts, in the lower testosterone levels-

Clark Engelbert: Right.

Dr. Wendy Myers: Because zinc is needed for all those things.

Clark Engelbert: Exactly. Exactly. So when you multiply that and you understand that "Well, there are 21 or 23 essential elements," if one of them gets dysregulated, you can have

all these different problems. If multiple of them get dysregulated, which is quite common, especially in America, because the food supply is so denatured and nutrient-poor, then you can see how problems just exponentially get worse and worse and very, very quickly. And that's not even to mention that minerals, another really important fact about them, exist in a system inside of you. And the implication of that is that they all affect each other. There are these nutrient interactions that occur, and if you have, say, low zinc, a lot of different consequences or effects can occur as a result of that low zinc in your other elements.

Copper can build up, and that can cause anxiety. Heavy metals can build up because zinc sort of accesses a universal buffer against metal toxicity. But also, I was reading a really interesting paper. There's an antagonism between zinc and sodium, and sodium reabsorption in the kidneys goes up when zinc is low. So that could be one of the causes or reasons for sodium-sensitive hypertension. And it's sort of there's not only do minerals exist in a system, and they affect each other, but there are these second and third-order effects that exist as a result of one element being knocked out of balance.

Dr. Wendy Myers: Yes. Yeah. I mean, there are just so much to this and you can make a case for every mineral and the different issues that it causes and one of what's out of balance and minerals -

Clark Engelbert: Yes.

Dr. Wendy Myers: Displace metals out of the body. Can you talk about that phenomenon and how taking minerals is a really good heavy metal detoxification?

Clark Engelbert: Yes. Okay. So this principle formally in the literature is called ionic mimicry. And it's a really, really important idea for people to understand. It's that while minerals exist in this system inside of you, heavy metals are a part of that system. And when you become lower, or you have bioavailable forms of the essential elements of the minerals, heavy metals can substitute for those essential elements. And it goes a little deeper than that. Not only are metals displacing or substituting those essential elements, but they actually work in the place of those essential elements. So if you have low zinc, for example, lead, mercury, and cadmium can all replace zinc on those enzymes that zinc is supposed to work on. So the enzyme efficiency gets poisoned as a result of this substitution process, but it keeps you alive in the short term. So if you have nothing on certain enzymes, if you don't have zinc at all, you could die.

And so the body is actually using metals as a short-term adaptive mechanism to keep these enzymes that you need to actually live and exist functioning at some low level. And so that's maybe another really important idea or concept that people I don't feel like fully understand is that, I know many people know about this, but minerals are the spark plugs of life. What does that mean, though? And it means that minerals are involved in either structural components or functional

regulators of 25 to 30% of the enzymes in your body. And enzymes are these specialized classes of proteins that catalyze biochemical reactions to make life possible. And so if you think about the history of biochemistry research and if anyone's listening who's taken biochemistry 101 and had to go through Lehninger's principles of biochemistry, which is this insane textbook that gave me nightmares in school.

Dr. Wendy Myers: That you just finished?

Clark Engelbert: Yeah. Right. It took me 10-

Dr. Wendy Myers: Last year?

Clark Engelbert: Yeah.

Dr. Wendy Myers: Like waking up at night in terror.

Clark Engelbert: Yeah. Exactly. Exactly. They talk about enzymes in that book. There are a lot of chapters dedicated to the research and study of enzymes, but most of the history of biochemistry research is the history of enzymes, looking at how these specialized proteins operate and catalyze biochemical reactions. And the minerals are integral parts structurally and functionally of those enzymes. So that's also another really important point. But to understand the way that metals work or bioaccumulate, you have to understand how they're interacting with those essential elements in the first place.

Dr. Wendy Myers: Yeah. And people, because they have mineral deficiencies, their bodies retain these heavy metals.

Clark Engelbert: Exactly.

Dr. Wendy Myers: And they become heavy metal-toxic in one way because they're mineral deficient.

Clark Engelbert: Exactly.

Dr. Wendy Myers: And there are so many different reasons for mineral deficiency.

Clark Engelbert: Yes. Exactly. That's probably the reason; if people take nothing else away from this chat that we have today, I hope that they take away that point. It's those mineral deficiencies; it's not just deficiencies but imbalances. They make you much more predisposed to bioaccumulate heavy metals. And there's actually really interesting research on the mechanism or the mechanisms through which this is happening. And so one of those mechanisms is sort of ionic mimicry, but the way ionic mimicry works is that the ionic radii of these elements are similar. So their sizes are actually very similar, and there are other chemical properties that they share. Maybe they have a similar valence or something. And that's

what makes these heavy metals able to substitute and replace those essential elements in the first place. It's those similar chemical properties, the ionic radii, and the size of these elements. I was reading a paper on this exact thing, and the ionic radii of magnesium, iron, and aluminum, they're all very, very, very similar in size. So it makes it so that aluminum replaces iron and magnesium very, very readily.

And then, "Okay. What happens then when aluminum replaces magnesium on ATPAs or other enzymes that magnesium is responsible for?" You can destroy energy production in the mitochondria if aluminum replaces iron, which can destroy electron chain transport. So some of the most fundamental processes that are required to keep you healthy and well get disturbed as a result of those metals replacing those essential elements. And I always try to tell people, clients, especially my consultants, that you should think of metals as systemic toxicants where they can locally exert a negative influence wherever they get deposited, in your kidneys or your heart or your brain. But because of their ability to substitute for the essential elements in important enzymes, they can cause 10 or 20 different problems just through their ability to impact inflammatory pathways all over the body. So that's really, really important.

But another fact about metals that I think people don't quite grasp either is that metals are not biodegradable. So they're actually a lot more important as a class of toxicants than a lot of the synthetics that are out there. But there are; literally, I'm sure there are tens of thousands of synthetic chemicals being used either intentionally in personal care products or whatever, or they're just inadvertently released through industrial processes in the environment. So metals are special because not only are they able to substitute for those essential elements, but they are not biodegradable. Meaning when they get used in the environment or in industrialized industrial processes, they're getting discharged into the environment. They don't just go away. The accumulation process of those metals in the air, in the water, in the soils, that's cumulative year-over-year. And it goes back to some of the metals, I think cadmium, the half-life is like 30 years, the half-life. So for half of the cadmium to be broken down, it takes 30 years.

Dr. Wendy Myers: I know people get so worked up about forever chemicals and-

Clark Engelbert: Right.

Dr. Wendy Myers: Things like that. But heavy metals, this has been around for decades, it's not a new thing.

Clark Engelbert: Right.

Dr. Wendy Myers: And it's crazy how even in organic food, there are heavy metals. I did a show on how organic food can have tons of heavy metals. It might be chemical-free-

Clark Engelbert: Yeah.

Dr. Wendy Myers: But there's lead in all kinds of other metals, and there is arsenic from pesticide use and settling in the soil from the air lead and things like that. So-

Clark Engelbert: Right. Right. So metals can substitute for essential elements, which is maybe the most important thing that people understand. This leads to their systemic toxicity. And the fact that they're not biodegradable is also very problematic. But their ubiquity since the advent of industrialization is, I think, maybe the most important fact about them. People don't quite understand or have a grasp on why they are in the environment to such a degree they are now? And it's really because they're useful in many different industrial processes. Lead is still used in jet fuel as an anti-knocking agent. It was used in gasoline cars, which was a total health disaster for decades. But it's still used in jet fuel, right? Because it's very good as an anti-knocking agent. Nickel is used in the hydrogenation process for all of your trans fats. That's been done since they discovered the ability for nickel to be used as a catalyst in like 1915. So-

Dr. Wendy Myers: Yeah. And that's on all your fast food, all your packaged food-

Clark Engelbert: All of it.

Dr. Wendy Myers: Everything you're eating every day.

Clark Engelbert: Exactly. And that people talk about seed oils and seed oils are bad and not good for you. But metals are; definitely, I think, much more toxic, much more pernicious for those other reasons. But aluminum used in the water supplies an antifungal agent because it's very good at killing fungal microorganisms. Arsenic is used to treat the wood on decks; it helps to prevent water damage, right? And so you would just be, the ubiquity of these elements, you can't really overstate, millions of tons of these elements are being mined so that they can be used for industrial processes and through the mining those metals get in the air. Another real sort of interesting thing that I dug up in my own research is that I wanted to know, in terms of phosphate fertilizers, why are they so loaded with metals? And I was like, "Where is this coming from?"

Let's trace this back. And phosphate fertilizers have to be made from something, and they're made from phosphate rock. That phosphate rock has to be mined all over the world, deep within the earth. Well, metals are geogenic as well, meaning they're not just synthesized or anything; we're actually having to mine them from the earth. And so through the mining process for that phosphate rock, a lot of metals get bound up in that rock which gets ground down into this phosphate fertilizers. Okay. Well, phosphate fertilizers are the most commonly used fertilizers all around the world. You're getting a dose of cadmium with those fertilizers in every single pound of fertilizer that you're using on the soils. So there are interesting ways that they're transferred basically from their point sources to how they get into the food chain and ultimately end up getting inside of you through this process that we call biomagnification.

So lots of really interesting examples of that. I was always curious about mercury. Everyone would always say, "Well, mercury is in the oceans." And it's like, "Well, how the hell did mercury get in the oceans? It doesn't seem like it was designed to be that way." And one of the most important ways that it gets into the ocean is through those smokestacks, those coal-fired power plants over in China and India, which don't have scrubbers on them. And so the metals are used in those processes to burn fossil fuels and coal in particular. And it gets spewed into the atmosphere, that mercury. And it's spewed into the atmosphere as elemental mercury. And it goes up into the atmosphere, rains down onto the ocean. And there's actually an interesting process that occurs where mercury is biotransformed from elemental mercury into methylmercury by certain microorganisms in the ocean.

So elemental mercury is slightly less toxic than methyl mercury. And that's like another wrinkle with metals that gets people sort of confused is that there are different forms, different forms of the metals have different toxicity profiles. But to go back to mercury, where it comes from, and that sort of thing, the microorganisms in the ocean transform the elemental mercury into methylmercury through methylation. So your body has that capacity to change the form of metals inside of you, which is pretty wild. So if methylation pathways are broken or messed up for whatever reason, that can affect your body's ability to protect you against metal bioaccumulation as well. So the microorganisms methylate the mercury and change that elemental mercury into methylmercury. And then you have small fish eating that microorganism, medium fish eating the small fish, large fish eating the medium fish, and human beings eating the mercury and ending up with mercury toxicity.

Dr. Wendy Myers: Eating all the sushi-

Clark Engelbert: Yeah.

Dr. Wendy Myers: And the shellfish, the sushi addicts, and I'm an ex-sushi addict myself.

Clark Engelbert: Yeah. Yeah.

Dr. Wendy Myers: But-

Clark Engelbert: Hey, it's really good. We can't blame people for that.

Dr. Wendy Myers: Yeah. It's so delicious, but yeah, I still have it every once in a while; it's impossible to avoid.

Clark Engelbert: Yeah. That's-

Dr. Wendy Myers: Metals it's impossible to avoid in your diet even if you eat organic food.

Clark Engelbert: Right.

Dr. Wendy Myers: And that's the message here-

Clark Engelbert: Right.

Dr. Wendy Myers: You need to be detoxing your body even if you have all these other healthy lifestyle habits and diets.

Clark Engelbert: Yeah. Exactly. And that's basically how I coach all my clients, which is to say there's no way that you can avoid these elements. And actually, there are a couple really interesting papers I read a couple months ago on looking at a metal deposition in these remote locations around the world. And there are a couple cool, really enterprising researchers. This one guy who was a mountain climber also doubled as a researcher by day who was a mountain climber by night he took his team of graduate students 20,000 feet up on Mount Everest. And they wanted to study the snow and soil samples of Mount Everest for metal deposition. And they found really high levels of cadmium and arsenic in the snow and soil samples 20,000 feet up on Everest.

There are other really good studies looking at the Antarctic and some of the snow sheets in Greenland as well. They did a lot of this research after lead was discovered to exert subclinical effects in the 1970s. So there was a ton of research on lead, and that drove scientists wanting to understand the extent to which lead was deposited in these various locations. So there were studies in Greenland and Antarctica showing really high levels of lead. So it doesn't matter if you decide to become a monk or a nun and you try to avoid these things like the plague; there's really no avoiding them because of their ubiquity.

Dr. Wendy Myers: Yeah. I mean, as you said, all the smoke sacks and industry and countries around the world that get into the weather patterns, deposits in our oceans, and air pollution are one of the number one ways that we get different toxins and heavy metals from car exhaust. So it doesn't matter if you're living out in the woods; you can still be breathing this stuff in.

Clark Engelbert: Yeah. Exactly. And the most important thing to know is that the responsibility lies on you and your family to try and detoxify these elements because the governments are pretty incompetent. I don't know if there's malevolence involved; that's maybe a different discussion. But the FDA recognizes aluminum; it's generally recognized as safe. So aluminum is used in a lot of different products, especially food products. It's used in baking soda. It's used as an anti-caking agent, and table salt it's used in protein powders. It's used as an anti-coloring agent in candy or a coloring agent, I should say. It's used in cheese. And it's all because the FDA recognizes aluminum as safe, but everyone who has half a brain realizes that aluminum is neurotoxic.

And there was a really interesting review that I read about a month ago in the Journal of Alzheimer's. A pretty serious journal basically recognized this review and recognized Alzheimer's as basically chronic aluminum poisoning. And there was that interesting research that came out shining a light on some of the lies that were propagated by some scientists saying that Alzheimer's is related to plaques and tangles in some of the neuronal compartments. Well, that may or may not be true, but what is causing those plaques and tangles in the first place? It's aluminum. There may be other metals involved, but aluminum is the main one implicated in those degenerative neurological conditions.

Dr. Wendy Myers: Yeah. I mean, the research is clear on that. I've looked at a lot of that research as well that aluminum's responsible for all different forms of dementia, including Parkinson's and others; there are many different forms.

Clark Engelbert: Right.

Dr. Wendy Myers: And so it's one of our greatest fears. That's one of the many people that are worried about brain fog or they watch their loved ones deteriorate from dementia. And many people want to preserve their brain function, and detoxification is going to be a big factor in preserving that.

Clark Engelbert: Huge. And the thing, I think, that another thing that's really important for people to understand is there are these two ideas that make metals really pernicious besides everything that we just talked about, which is that it wasn't discovered until the 1970s that metals exert. They can disrupt function at a subclinical level, where it's not just the acute phase toxic effects of these elements that are responsible for you feeling bad. If you get occupationally exposed to a ton of lead, that's going to cause a lot of serious problems. But even at low levels, very low levels of lead and all these other elements can contribute to a silent reduction in the function of your enzymes, your proteins, your hormones, your neurotransmitters, and thus the effects of those problems which manifest as behavioral problems, lowered IQ, maybe you don't quite have as much energy, you don't fall asleep as quickly.

Those are really subclinical effects of metals, basically. And that wasn't discovered until like 1973 by these two researchers, Grandjean and Landrigan, who were just brilliant. They're world-famous scientists who discovered the subclinical effects of lead, and they were sort of the lightning rod for getting lead removed from gasoline. So metals are exerting these subclinical effects on a very low level. And some people don't even really notice that they might be metal poisoned if they come out of their mother's womb with metal toxicity at a subclinical level. Maybe they don't grow as tall, and maybe their facial symmetry doesn't develop very well, right? Maybe their bone structure is weaker. So that's, I think, really, really important for people to understand the subclinical effects of these metals. But then also there's a latency period that exists from when you're exposed to the metal to when you present with symptoms.

So this is pretty well-known. This is in a book I read called The Toxicology of Essential and Nonessential Metals, written by Nicole Coleman and a bunch of other PhDs at Berkeley. If people are interested in reading that, it's a short read but a phenomenal book. But they talk about how if you're exposed to these metals at low levels, which everyone is at this point, there's this latency period where cadmium, for instance, if you accumulate cadmium for whatever reason, there can be five or 10 years that go by before the kidney function is affected. So it's sort of very, very difficult to detect metal poisoning because it's not very obvious sometimes where you are exposed in the first place. But symptoms may show up not until five or 10 years later. This is why there are a couple good tests out there to diagnostically assess your metal burden. But this is really why I love the hair test as just a critical piece for assessing your metal burden.

Dr. Wendy Myers: Yeah. Because it's such an easy at-home test to do. Anybody can do it.

Clark Engelbert: Very easy.

Dr. Wendy Myers: Yeah, it's very inexpensive. It's an amazing screening tool, but it's really important to test those minerals as well as heavy metals. There are tests that test for heavy metals like urine and stool-

Clark Engelbert: Yeah. Yeah.

Dr. Wendy Myers: But I always use hair testing as the initial screening tool. And can you talk a little bit about the validity of HTMA? Because I think there are a lot of people that don't understand how to read hair tissue mineral analysis, and they don't understand the no-show phenomenon in hair mineral analysis.

Clark Engelbert: Yeah. Preliminary, yeah.

Dr. Wendy Myers: And you see stuff on the internet about, "Oh, it's not accurate and blah, blah, blah." Let's just blow that out of the water here.

Clark Engelbert: Yeah. Yeah. So hair testing is very misunderstood even in the literature. So there was a review I read in 2018 looking at why there was such disagreement in the literature amongst researchers on whether or not hair mineral analysis is a valid tool to assess the nutritional status of some of the elements, but also heavy metals. And part of the reason for the discrepancy in the literature, even amongst all the researchers, is that much of the research done with hair analysis didn't consider that mineral and metal deposition in the hair is not uniform like it is in the blood. So with blood testing, you can take a blood sample one time and then, five minutes later, get another blood sample from a different area, and the mineral deposition and the metal deposition in the blood will be uniform. It won't change. But the hair does change because it's a biopsy tissue, and the hair is an extension of the skin and organ; different amounts of those minerals will be deposited at different times in your hair.

So you won't find good answers in the literature. You have to understand the first principles of hair analysis, which is the first and most important thing to understand about hair analysis is that hair is a biopsy tissue. So you should think of the hair as really an extension of your skin, which is a biologically active organ. Your skin has many important thermal regulatory functions. It acts as a protective barrier against environmental stimuli, and it has detoxification functions. The hair, to that end, serves a lot of those similar functions and requires everything that other biological tissues require to live and to carry out those things. So the hair is a biologically active organ, and it's like a biopsy test. I think another thing that people misunderstand about hair is that they think that the hair tells them about the total body load of any individual mineral, but it's more about reading the entire mineral system.

And it's an early indicator of what's going on with your entire mineral system. So in this way, the hair test is like an economics test where it measures not individual mineral levels but it's measuring the balance of the entire mineral system all at one time. And so those are, I think, some of the bigger reasons why people get hung up on, "Is hair analysis valid?" There's a lot of research showing that hair analysis is actually quite remarkable and able to be read if you understand it in its proper context. It's able to give us an early indication of imbalances in mineral levels and ratios and what's going on with the entire mineral system. So it's not necessarily about reading individual mineral levels; it's always about understanding that the minerals exist in a system and that the hair test is measuring that entire system in the cells, right? But also over about a three-month period of time.

Dr. Wendy Myers: Yeah. And they can look at mineral toxicities as well, correct? Because those-

Clark Engelbert: Yes.

Dr. Wendy Myers: It can be very, very problematic and cause health issues, just heavy metal toxicities.

Clark Engelbert: Exactly. Exactly. The thing that can be confusing is that while the minerals are essential for life, any of the individual elements, in either the wrong form or in too high a dose, can become toxic in those elements. So it's not the same as heavy metals where any small dose of heavy metal is toxic. The dose for the essential elements really makes the poison because they're essential for running your enzymes and all of these other functions that exist in your body. So you're right about this; it's about with the minerals, it's about balancing them against each other, making sure that nothing is too low or nothing is too high at the same time, they're sort of like a dose-response curve for each of the elements where you can end up with a fatal deficiency, but you can also have a fatal toxic excess at the other end of the spectrum. And there's a little narrow band there where an optimal intake will lead to optimal function.

Dr. Wendy Myers: Yeah. And so, what are some of the more common heavy metal toxicities that you're seeing in your clients?

Clark Engelbert: Aluminum is by far the most common. I haven't read a test in the last 40 years where the aluminum level was in a good range. So aluminum is by far the most ubiquitous metal in the environment. It's the third most common metal in the earth's crust. So it's pretty ubiquitous geochemically. But in terms of the way that it's used in industry, metal or aluminum, I should say, is used in the water supply in many Western countries. So plus, there are like a thousand other industrial uses for aluminum. So aluminum is the most common. The most common, I would say, is probably mercury. And this might be a little sensitive topic, but mercury and aluminum are in the vaccines.

Dr. Wendy Myers: Yeah. Mm-hmm.

Clark Engelbert: So there's that. But mercury, I read a really interesting paper. I mean, I find this interesting, some people might find this horrifying, but I read a really interesting paper a couple months ago on the manufacturing use of high fructose corn syrup. And since the advent of it, I believe it was synthesized in the 1960s; they used mercury to make the high fructose corn syrup. So my generation of people, Millennials, I was born in 1984, and I think probably you guys too in Gen X, we weren't drinking soda like it was going out of style when we were younger. And so I think there is a huge exposure vector for people besides just the fish it's used in, mercury is very useful for other applications as well. But it is in the soda, like with aluminum being in the water, well let's look at it, so soda is high-fructose corn syrup plus water. So it's a combination of aluminum and mercury in a can, basically. And what's really pernicious about that soda, in particular, is that the sugar forces your body to use up minerals to process it.

Dr. Wendy Myers: Yes.

Clark Engelbert: So it's like a double-whammy where the sugar and the caffeine are depleting your essential elements while you're getting a dose of aluminum and mercury at the same exact time.

Dr. Wendy Myers: Yeah, it's so insidious. Every meal I had a coke-

Clark Engelbert: Yeah, the same.

Dr. Wendy Myers: Or decades, I mean, it was a really long time.

Clark Engelbert: I know.

Dr. Wendy Myers: Maybe it's like 20 years or something like that, but until-

Clark Engelbert: Got it.

Dr. Wendy Myers: I woke up to that, but that's just one exposure over decades.

Clark Engelbert: Yup.

Dr. Wendy Myers: I mean, there are just so many examples that we can cite that I've talked about so much on the podcast. So how do we get rid of this stuff? How do we eliminate heavy metals?

Clark Engelbert: So there are a couple general strategies that I can talk about first. The strategy that I use with my clients is called mineral balancing. And this is really a specialized form of heavy metal detox where really what we're trying to do is optimize and balance the mineral levels in your tissues. And this causes a dramatic improvement in enzyme efficiency, energy efficiency in the cells, and other parameters related to your detox pathways. And that is really the trigger that we're using to detox metals is mineral balancing. But some general strategies I think that people should keep in mind are that you want your diet to be as nutrient-dense as humanly possible. So extreme diets, you want to avoid those, the plague. So veganism, I think, is quite a bit better than veganism. So sometimes, I don't know, carnivores get sensitive like the vegans when you say, "Well, maybe vegetables aren't making you sick." I don't know.

Dr. Wendy Myers: Well, I'm vegan, Clark. What's wrong with veganism?

Clark Engelbert: Wow.

Dr. Wendy Myers: I'm telling you.

Clark Engelbert: Wow. I was going to say your brain is actually working pretty well for a vegan.

Dr. Wendy Myers: Yeah. I was vegetarian for 18 months, and then I went vegan for about six months.

Clark Engelbert: Mm-hmm.

Dr. Wendy Myers: Yeah, I could not think at the end. I could not hold the information. By the end of that six months, I was reading all that this health stuff, but I couldn't remember any of it. I don't know how much has changed, but I'm joking. But, yeah, I couldn't remember what I was reading. I was planning, I was like, "I want to get a master's degree. I want to have these goals for my education."

Clark Engelbert: Yeah.

Dr. Wendy Myers: I was like, "how am I even going to do that?" So I don't know how vegans survive. I'm sorry.

Clark Engelbert: Yeah. And the thing about veganism, before we get back into the ways to avoid metal toxicity, not only are you short on iron and zinc, B vitamins, and taurine,

but there are no sulfhydryl amino acids that you're getting, like cysteine and methionine. And those are sort of your body's first line of defense against metal toxicity. So you definitely want to avoid extreme diets. We're designed as omnivorous beings to eat plants and animals. Sometimes people have individual food sensitivities, and they have to stay away from a specific food. I find that's usually metal toxicity. But the idea is that you want to stay away from extreme diets, basically. Optimized for nutrient density.

So what we use with our clients is a modified version of paleo where we're getting a lot of high-quality meats and a lot of high-quality vegetables that are cooked. But you really want to maximize nutrient intensity. Raw dairy is phenomenal, just an incredible source of fat-soluble vitamins and minerals like calcium and magnesium. So optimizing for nutrient density is the most important thing. Number two would be just to do the best that you can in your daily life to avoid common exposure vectors for metals and stop drinking tap water. It's got fluoride and aluminum in it. There could be lead in it. The Flint water crisis showed us all how in certain municipal areas, there's lead toxicity in the water.

Dr. Wendy Myers: I think there are so many Flints.

Clark Engelbert: Yes.

Dr. Wendy Myers: There are so many Flints around that just have not gotten the news story.

Clark Engelbert: The crazy thing about Flint was that what happened mechanistically was that they started to draw on their water from a different source and the source of that water had a different pH. So it caused the lead pipes that had previously been used actually somewhat safely to leach the lead because the pH and the water were different. So there are subtle things like that that can really affect your exposure. So-

Dr. Wendy Myers: Yeah. And that same thing can happen with you or a lot of companies or municipal water sources, well used to use chlorine like LA did this, and they switched to chloramine, which is cheaper, but that can leach metals from the pipes as well. And these are things that are happening all over the place, and people just aren't really paying attention.

Clark Engelbert: Yeah. Exactly. So you want to avoid common exposure vectors like in the water. Another really interesting thing about aluminum and fluoride is that metals they're synergistic effects. They're synergistic toxic effects, I should say. So a small amount of aluminum will be toxic, but a small amount of fluoride paired with that can actually create a more toxic compound. I believe it's called aluminum fluorosilicate, has this unique ability to cross the blood-brain barrier and is more toxic than either of those elements, individually. So this is something that isn't discussed in the literature as much, and it's something

probably for future avenues of research. But the synergistic effects of metals are quite significant.

And that's how we're actually exposed to them on a daily basis where a lot of the research on metals right now is devoted to studying individual elements and their specific effects on certain systems where Sally down in Texas or wherever in up in Ohio, who's been drinking tap water her whole life, she's exposed to all manner of different metals. And those metals have synergistic negative effects that are much worse than any individual exposure to those elements. Plus, you're getting all these other synthetic toxicants on top of that. We really don't know all of the effects of all of these things on the environment and on human beings.

Dr. Wendy Myers: Yeah. I don't know how we're even still alive. It's interesting effects-

Clark Engelbert: Well, you're probably using your sauna pretty regularly, am I right?

Dr. Wendy Myers: I am, yeah. I love my sauna.

Clark Engelbert: Okay. Yeah.

Dr. Wendy Myers: I love my foot baths. Yeah, I'm just living that detox lifestyle that people need to be doing these days. Can you talk about your recommendations to people when it comes to heavy metal detox?

Clark Engelbert: Yes. So the biggest thing would be to maximize nutrient density. If you want to work with me and get on a mineral balancing program, that would be, I think, probably the best thing that people can do. The mineral balancing has these phenomenal effects on the endogenous aspects of your detoxification systems. So really, what we want to try and do with mineral balancing is optimize your own detoxification network inside of you that you have, which is much more powerful than any individual supplement that you can take. So you have an endogenous detoxification network inside of you, metal-binding proteins, antioxidant enzymes, and your hormones, which is an interesting avenue for research. But hormones send signals like adrenal, and thyroid hormones send signals to the liver to activate detoxification enzymes.

So ceruloplasmin and metallothionein, other detoxification enzymes, and metal-binding proteins are activated in the presence of your adrenal and thyroid hormones. So improving adrenal and thyroid function is a big vector for improving your body's own ability to detoxify. So that would be another thing that you could focus on lowering stress in your life, huge. Detoxification is a parasympathetic activity. It's only activated through the parasympathetic branch of your autonomic nervous system. So anything that you can do to chill out, relax, and get in the sun. If you're in a great location like Wendy's. It was on-

Dr. Wendy Myers: Yeah. Live in Mexico, and I highly recommend it to relax.

Clark Engelbert: Yes. I'm so jealous. So jealous.

Dr. Wendy Myers: Yeah. I think people don't realize when they're all really stressed out and chronically stressed out for years, they're not really not sleeping, they're not detoxing, and they accumulate this stuff over the years, and years, and years and they wake up one day, "Why am I fat? And why am I unhappy? And why can't I sleep?" And they start having all these different health issues as a result of that.

Clark Engelbert: 100%. So doing anything that you can to get yourself in the parasympathetic grounding is very good for that purpose. Getting in the sun, like sunbathing, is very parasympathetic. There's a lot of really interesting research on UVB affecting cortisol levels, so that's huge. But the sauna, the sauna space type of sauna, is phenomenal. Those are, in my opinion, the single most important biohack that you can do to prevent metal toxicity. Because you're not only getting the photobiomodulation effects from the near-infrared frequency coming off of those lights, which is optimizing your mitochondrial function. You're getting the heating effects and the sweat effects caused by those mid and far-infrared frequencies coming off of them. So blocking EMF. So these are some foundational things that you can do to lower your stress levels. I read some really interesting research on certain magnetic fields being able to deplete zinc and selenium.

So that's sort of in relation to optimizing your mineral intake, right? It doesn't have much to do with how much you're taking in but with preventing minerals from being lost. Anything that you can do will help to protect you against metal toxicity. So sauna, a lot of the things that Jack Crews and those folks talk about phenomenal, like the light exposure, sun exposure, optimizing nutrient density, getting rid of the exposure vectors, and then sometimes people go down that road of trying to do all those things, and they're sort of at an impasse and they need something more at that point, I think mineral balancing is really for those folks.

Dr. Wendy Myers: Yes. Yeah. Because you can do all these detox protocols, like you said, infrared saunas and taking various supplements and trying to make a shotgun approach to detox.

Clark Engelbert: Right.

Dr. Wendy Myers: But for sure, doing that mineral balancing I and heavy metals testing can help you with that more sniper approach too.

Clark Engelbert: Yeah.

Dr. Wendy Myers: And optimizing your body's ability to detox. It's not just going in and grabbing the metals and pulling them out. It's just not that simple.

Clark Engelbert: Right.

Dr. Wendy Myers: I mean, that's how we want to think about things, but can you explain that concept a little bit and why chelation using IV, heavy metal chelation therapy is maybe not really the best strategy for a lot of people.

Clark Engelbert: 100%. And I, that's exactly where I was going with this is that if you go back to what we were talking about with ionic mimicry and how metals substitute for minerals, and that's the main mechanism through which metals bioaccumulate in the first place, then you understand that if you just rip the metals out where they're replacing the essential elements on certain critical enzymes, then you realize, well if I just rip this metal out using, it could be a synthetic chelating agent, EDTA, EDMSO, it doesn't really matter. It could be something as simple as zeolite or chlorella or something else. If you rip out that metal and you don't leave anything at that enzyme-binding site for it to function, you can make yourself much, much worse.

And so it goes back to understanding how metal bioaccumulation happens in the first place? And it's related to mineral imbalances. That's the critical piece for people to understand. But chelating agents oftentimes chelate out essential minerals as well. So not only are you ripping out that metal, which is actually serving a purpose inside of you, an adaptive purpose, but you're lowering your mineral status even more through the use of chelation.

Dr. Wendy Myers: Yeah. Yeah.

Clark Engelbert: So, yeah. Mineral balancing is sort of like the anti-chelating method, where we don't focus on any individual metal. We're focusing on balancing the entire mineral system and reverse engineering the mineral imbalances to cause metal detoxification down the line. Chelation is the very opposite of that approach, where you're just pulling out the metals. You're targeting individual metals, which can be problematic if that metal is being used for something important to keep you alive.

Dr. Wendy Myers: Yeah. Yeah. And doing the chelation, that's not addressing chemicals at all as well.

Clark Engelbert: Yeah.

Dr. Wendy Myers: Whereas, if you're optimizing your body's ability to detox and sleep and mineralize, your body's going to be more efficient at excreting that stuff.

Clark Engelbert: Exactly.

Dr. Wendy Myers: Yeah.

Clark Engelbert: Exactly.

Dr. Wendy Myers: Yeah. So this is an amazing conversation. I think that it's really important to help people understand in a more granular way-

Clark Engelbert: Yes.

Dr. Wendy Myers: How detoxification occurs and why you need to be testing for heavy metals and making the case yet again on every podcast why you need to be adding detox to your healthy lifestyle. Because, I mean, diet, exercise, supplements, it is not enough. I mean, I can't tell you how many friends I know that are sick or that have died or had cancer or something, and they're living relatively healthy, but they're not thinking about detox, not doing stuff in regards to that because you're not getting this info at your doctor.

Clark Engelbert: Yeah. I come across so many clients who are in that same boat. They've been doing the right things for many years, and their tests sometimes will come back with high levels of metals. And I'm just like, "Don't shoot the messenger. I'm not telling you that you're doing anything wrong," but these elements are so ubiquitous it's very hard to escape them. Even if you do the right things, you do have to add that extra tier of mineral balancing using these detoxification procedures that we recommend in a strategic way if you really want to rid yourself of these poisons.

Dr. Wendy Myers: Yeah. And people get upset, too. They get upset, they get really scared about the results.

Clark Engelbert: Yes.

Dr. Wendy Myers: And I was surprised, too. I lived a super healthy lifestyle most of my life, and when I got my test results back, I had been reading about mercury or lead and reading about all these things. In reading about health, you come across articles about mercury, but I didn't think they applied to me because I was so healthy.

Clark Engelbert: Right.

Dr. Wendy Myers: And to think, "Oh, it takes some acute exposure, or I don't know what I thought it would take." But when I got my test results back, and I had super high mercury in arsenic, I was really surprised. And for me, it just sparked this light bulb that just has not gone out.

Clark Engelbert: Right.

Dr. Wendy Myers: It's just started this ball rolling with wanting to learn everything about this and helping other people discover this missing piece of the puzzle that they need to be healthy and reach their health goals.

Clark Engelbert: Exactly. And that's just on Matt Blackburn's podcast, and I basically said to him the same exact thing that heavy metal environmental pollution and exposure to

human beings is the most important human health problem on the face of the planet right now, by far. Part of it has to do with its ubiquity, but people just aren't paying attention to it. So it's so underrated. But if you really look at the details we have and go through them in this podcast, you realize that it's a much more important problem than people are aware of. So if you become aware of it, you can really have some power and take some power back in your own life to detox these things. Once you go through metal detoxification, you can feel like a different human being almost totally. So that, I think, is another really important thing for people to understand.

Dr. Wendy Myers: What are some of the metals that you detoxed over the years?

Clark Engelbert: Yeah. So I went through some pretty wild lead eliminations, absolutely insane lead eliminations. So I think over the course of my life, I was exposed to lead at a low level, but there was one event that occurred maybe 12 years ago. I was living with an ex-girlfriend at the time in an old place in Tucson, and she wanted to do a weekend project where we would scrape off the paint on the walls in her bathroom. And at the time, I was like an idiot, and she was like, "You really should wear a mask. There's lead in the paint." And I was like, "I'm fine. I'm going to be fine. Shut up, whatever." And so I was breathing in these lead fumes, these lead-based paint fumes, for a couple days doing this project with her. So I was exposed, you could say occupationally, to lead, but after that my anxiety got much worse. Lead can cause violent thoughts and criminality in some people. There's a lot of really interesting research on that, and how the metals interact in the brain is a whole nother; we could do another podcast on that. We should do that.

That would be, I think, a really fascinating episode. But so the lead was a very big one for me. Going through some lead eliminations changed my life completely. My sleep got better. I lost 50 pounds after eliminating lead. So there are a lot of endocrine effects that these metals have as well, that people should be aware of. I went through some huge copper eliminations as well. So I think lead and copper are sorts of those two metals that cause anxiety and mental health problems more than any other metals. But copper lead nickel was a big one for me. I used to have really bad suicidal thoughts. And I went through my first elimination on mineral balancing early on. You can ask Pam. She went through it with me. I'd be calling her, being like, "I feel so awful. What's going on here?" And went through the lead elimination. Or not the lead, the nickel elimination, the suicidal thoughts went away. It was really remarkable. So those are the three big ones for me. Also went through some big tissue calcium eliminations as well.

Dr. Wendy Myers: No, then the calcium can be very numbing.

Clark Engelbert: Exactly.

Dr. Wendy Myers: The body's innately intelligent; people have pain syndromes or abuse or other things going on. The body will accumulate calcium, the soft tissues just numb,

and the nervous system transmissions can transmit pain or cause perceptions of pain.

Clark Engelbert: Yeah. Exactly. Exactly. So, yeah, calcium can just make you feel like calcium's a buffering agent anyway. So it buffers you against stress. But if it builds up in toxic amounts, it can make you feel numb, and you can't feel anything. Or it can actually really affect energy, the energetic mechanisms in the cells as well. So it can make you very tired.

Dr. Wendy Myers: Mm-hmm. Yeah. It all the whole affects the minerals and the body and the deficiencies and the toxicities. It's fascinating. It's really, really interesting. But the bottom line is people just want to feel better, that's all. You're listening to the show. You don't want to detox and do all this stuff.

Clark Engelbert: Right.

Dr. Wendy Myers: You just want to feel better, right?

Clark Engelbert: Right.

Dr. Wendy Myers: But this is what you have to do. You have to do detox protocols to get there. So Clark, thanks so much for coming on the show and imparting your wisdom. I know you've been involved in the heavy metals research study, and you've done a lot of research over the last decade on this topic. So it was really a pleasure to have you on the show. So where can we find you, and where can the listeners work with you?

Clark Engelbert: Yeah. So I just wanted to say thank you, Wendy, so much for having me on. It's an honor. I've been following you for a while, and you're doing incredible work as well. So totally jealous of your business and everything that you've been able to accomplish. But people can find me at www.nutritionalanalytics.com. That's the name of our health consulting service that specializes in using hair tissue mineral analysis to set up healing protocols to detoxify your metals and cause healing. So you can find me there. I'm also on Instagram; I have been using Instagram quite a bit more lately. It's all lowercase; nutritional_analytics is the handle on Instagram. You can also find me on Facebook on the Nutritional Analytics page. Just type that into the search bar. Or you can look; I'm posting quite a bit on my personal profile, Clark Jeffrey, on Facebook. Or you can email me at clark@nutritionalanalytics.com. So lots of ways that you can get ahold of me, and I definitely still have some slots open for clients now. So, yeah, I would love to work with people.

Dr. Wendy Myers: Okay. Great. Yeah, you might be sorry you gave your email and additional publications. But yeah, everybody emailed Clark with all of your questions.

Clark Engelbert: Right. Right. Right. Right.

Dr. Wendy Myers: Well, Clark, thanks for coming on the show, and everyone, I'm Dr. Wendy Meyers of myersdetox.com. Thanks so much for tuning in to the show today. And it's really a pleasure every week to be able to have experts from around the world help to maybe give you that one last, that little key in the puzzle to help you upgrade your health. And that's why I'm doing this. So thanks so much for tuning in and taking the time. I'll talk to you guys next week.