it became clear and clear to me, you know, from my mentor, one of my mentors, Dr. Joe Pizorno, that environmental toxins were a huge piece that was underappreciated, at least in the conventional side of things, and even in research.

So I think, we have abundant evidence that these environmental toxins are pernicious and in many, many ways, across the, I mean we're in a chemical soup really, You know, if you look at, not about heavy metals for a long time, but mold and mycotoxins, VOCs, you know the forever chemicals are here, more about glyphosate.

So I think we know that these things are damaging, But where the gap is to answer your question is like, we don't have a whole lot of evidence on what you can do to, help patients that have these exposures.

Other than the obvious of like trying to minimize exposurs, that's very difficult to do. Symptoms are only part of the story. I'm Dr. Drew Kidder. I am Dr Emily Hernandez.

And on the healing terrain, we explore deeper systems influencing clinical outcomes from toxic burden and microbial imbalance to the foundational factors that drive resilience and long-term health.

Well, hello and welcome everyone. My name is Dr. Drew Kidder. I am the VP of Education with Cellcore Biosciences and Biotidin Botanicals. And I'm joined by my colleague, Dr Emily Hernandez, our Director of Healthcare Practitioner Education.

That's always a mouthful. But we are super, we get excited for every single one of these Healing Terrain podcasts. But today we're super super excited to unpack some science with you and really kind of get a little bit of a view behind the curtain, if you will, of the science that has been occurring behind-the-scenes with Cellcore.

And, you know, I will just put it out there. We have really over the past year, Spare no expense you know in will certainly have them maybe allude to what has been invested in some of this clinical research but we are super excited to have today's guest who is dr christie adamo leading researcher in integrative and functional medicine and a partner at ovation lab i'm sure many of you are familiar with you some location labs work work Chris really has been a principal investigator, if you will, on more than, and you can correct me if I'm wrong, something that I saw was around 30 clinical trials and has authored over 100, some people shoot for one, peer-reviewed publications with really a particular focus on natural products heart and passion for this industry, biomarkers, and what I love is translating emerging science, if you will, into meaningful clinical outcomes.

That is so critically important. So today, again, we're gonna get that peek into the science looking at what clinical research is revealing about what we love with cell core and biocide and detoxification, gut health, mitochondrial function, and really including some of the exciting research that's underway around Cellcore's bioactive carbon technology.

So Chris, welcome to the Healing Terrain podcast. Yeah, my pleasure. Thank you for the intro and look forward to our chat today. Yeah. So Chris, kind of a leading question is, as I said, you've spent a large part of your career trying to bring greater scientific rigor, if you will, to integrative and functional medicine, right?

When you look at areas like detoxification, gut health, mitochondrial health. Where do you personally and professionally think that the biggest gap exists between what we believe clinically as practitioners and what actually demonstrated through research and the research that you and your team have done.

Yeah, that's a great question. So, you know, I've been around this field for a while and I got into it because I had benefited, like so many others had benefitted so much from it myself, really around the lifestyle medicine.

That's how I kind of got in to this was that University of Maryland School of Medicine for about 20 years and was

really into exercise and nutrition. Those are the two big areas and they're important.

I have seen you in the gym at conferences. These are helpful, right? But I think As I got a little further along with this, I started to realize that there were, you could be doing those things and still not anywhere near thriving.

And it became clear and clear to me, for my mentor, one of my mentors, Dr. Joe Pizorno, that environmental toxins were a huge piece, it was underappreciated, at least in the conventional side of things, and even in research.

So I think, you know, we have abundant evidence that these environmental toxins are pernicious and in many, many ways, across the, I mean we're in a chemical soup really, if you look at, not about heavy metals for a long time, but mold and mycotoxins, VOCs, forever chemicals are here, more about glyphosate, So I think we know that these things are damaging, but where the gap is, to answer your question, is that we don't have a whole lot of evidence on what you can do to help patients that have these exposures.

Other than the obvious of trying to minimize exposure, that's very difficult to do. So there aren't a lot a products, and I thin clinically we see people do get better.

We've seen that with Cellcore and with some other strategies. But the science wasn't really there, but it's going to be there. It's actually underway right now.

And I think Cellcore has the opportunity to play a leading role in this. We've got a number of studies that are either finished or are underway that we can talk about today.

So Dr. Ramley, I have a kind of follow-up question to that, right? Because we know as clinicians, having been in the trenches myself for now over 25 years, we throw out that word detox and detoxification.

And it gets used in our industry in an integrated functional root cause, foundational medicine, very loosely. But Chris, follow up question is, from a clinical perspective, how do you actually define detoxification?

And really, I guess, more importantly, on the clinical side, how you measure whether detoxication is actually occurring? Well, you can look very simply, although probably incompletely, at levels in the blood or levels of the urine of specific toxins.

And that's typically what's done in research. We're going to talk about a study we're doing today. not the whole gamut, but a large gamet of different toxins.

So that's one way. But then you got to look at also, you know, what are the patient's symptoms? I mean, when are you seeing in terms of how are they doing?

And you what conditions are improving, What symptoms are I improving? But classically, it has been looking and, hair, blood, urine, stool, like what's being excreted.

And obviously it's a little bit more complicated than that, But that is one of the ways that we're doing that. It's great that you mentioned that, Chris, because I think, yes, seeing things change on labs, but kind of bringing it back to the clinical pieces, a lot of times we don't see those changes happen right away.

We see changes in symptoms, so I just think it's so important to put all of these pieces together, especially as a clinician, understand the history, the symptoms and how the systems are changing, plus the labs.

It's not using just one, it's using the combination of the whole picture. Obviously, knowing that we can get some changes in the labs and the hair, urine, blood I think is extremely valuable to practitioners, to patients themselves.

But yeah, I love how you mentioned, you know, looking at both what people are symptomology and how the the lab's are changing. Yeah, I can tell you, you know, this is an issue in research more generally.

I mean, historically, we would look at treat biomarkers and we know that some of them are probably not, they're not really telling much of a story at all, but that's how drugs get approved and that how things get, on the conventional side.

But there has been a more general movement towards what we call patient-reported outcomes. Essentially, how is the person feeling? You know they are not defined by our biomARKers.

How are they actually doing? How they, what things are moving with them? So the ideal is to combine both when you can. Both the markers. I mean, the reality too, I'm sorry.

The reality, too is that a lot of these studies are, they're controlling variables, which is great. But when you try to translate that to clinical practice, it's hard to control the, in fact, we don't and can't control some of those variables.

So, you know, seeing how the actual results kind of in the lab kind actually translate to the clinical practices I think is huge. That's what I'm excited about the practitioner study we're going to talk about later, because that is totally real world.

Yeah, absolutely. I love the fact that you bring up, sadly, as I refer to it as chasing biomarkers, it's much the same way. And I've talked about this more and more, and even on this podcast, how everyone is in tune with their devices, right?

Their watches, their rings that are telling us how we should feel. And it's the same with biomarkers, right? Because biomarks, whether they're not changing, but someone feels better symptomatically, their symptomatic expression changes, on a lab they may not look like they are getting better yet.

Or the opposite is true, that there are shifts in biomakers but the patient still isn't feeling the way they want to feel. tying all of these together, that's why I love utilization of surveys, looking at assessment forms, because those are in the patient's words or them noting on a scale of one to 10, how are you actually feeling?

So when you as a practitioner or a researcher can look back and go, okay, well, these are changing, but you also said that you went from this level to this, level is incredibly powerful.

So let's talk about some of this amazing research that guys are doing. We've been teasing everyone, so why don't you tell us a little bit about some of the actual clinical studies that have been going on behind the scenes at Cellcore and Biosciene.

Sure. Well, I can tell you we've done a series of studies, and so we either, Innovation Lab, we'd be the lead some these, or we're going to some my colleagues at universities to lead them and even people I didn't know, but we reach shop take because they seem like the right place to do it.

And this has been everything from looking at the raw material, the bioactive carbon, to some of the finished products, all the way up to the protocol level.

Because again, that's where we feel is most relevant. We need to understand sort of what's happening mechanistically. That's what we've done with some raw materials stuff.

we need understand what is happening with individual products and then these are used in clinical care typically as protocols. So we understand that too.

So the first one that was done was a preclinical study. This is currently under review, so the study's been done and going for peer review publications on all of these we'll talk about today.

We know how important that is too, to sort of get the word out and get to credibility. So this looked at some of the bioactive carbon formulations and looked, I mentioned before, lead and glyphosate as two common and really damaging toxins.

And this study found that some of the humic dominant formulas had dramatic reductions, you know, in both lead and in glyphosate relatively quickly. So very excited about that and what it means.

You know as I, as to brush up before our discussion today, I looked at there's really nothing to get rid of glyphasate right now in the published literature.

It's one of first studies that shows that something we can do can help get rid of these toxins. Those are two very different types of toxins too, heavy metal and glyphosate.

So we're very excited about that and we should be hearing word about the publication pretty soon. That's huge. And just for the listeners, I may actually ask a question for Drew.

Can you just give us a quick run overview of the humic and the fulvic, just real quick for people who are listening and aren't quite sure what we are talking about.

Yeah, great question, Dr. Emily, because people may just be tuning into this one because they want to see the science behind it before they tune into other podcast episodes.

But we refer to our bioactive carbon technology, our unique extracts of humic acids and fulvic acids. And if you are not familiar with humics and Fulvics, they are, in essence, organic acids, the result of biological decomposition of Organic matter, we like to say plants and all of those in nature through biological decomposition that leave these rich deposits in the soil.

First of all, the primary deposit is called humus. I kiddingly sometimes say not hummus, that wonderful Mediterranean dip we like to use, but humus, which is this deposition of this organic matter in soil.

From that humous, we can further extract humic acids and fulvic acids. Humic the acids are a large chain carbon structure. And from that, humac acid, you can extract fulsic acid much smaller.

Oftentimes we talk about how based on their size, based their energy, if you will, they have different utility. Humic acids tend to work more in the gut, similar to a lot of conventional binders that people may think of, things like activated charcoal, bentonite clay.

They act as kind of a sponge, if you will, absorbing toxins and toxicants in the digestive system. But fulvic acids are naturally smaller. Sometimes people say they're naturally nano-sized particles, not adulterated in a lab to be, you know, nano.

they have the ability to move more systemically. Hence, some of the research that we're looking at why you saw shifts, Chris, in some the studies that you did utilizing more humic-facing products versus fulvic-facing.

So hopefully that gives people, as we are talking more about bioactive carbon and humics and fulsics, you know, what they are and what what we do and we were proving they do through your research.

Amazing. Well articulated as always, Drew, and thank you for that, even from my perspective. I can tell you it's a perfect segue into fulvic. We saw humic in that study.

There's another study done with the more fulsic dominant formulas. This was done by colleagues at the University of Memphis that do a lot of nutraceutical work.

And this looks specifically at how can these, the fulpid dominant format, impact mitochondrial function. Again, this is one of the farthest upstream influences on health across the board.

We often think about it for energy and vitality, but darn near everything is impacted by how our mitochondria are functioning. That was the goal of this study was to see how, again, in cell cultures, fulvic could impact mitochondrial function.

And not to get too technical, but this used state-of-the-art seahorse technology that is how we measure what we call mitochondrial respiration, one of the ways to see how mitochondria are doing.

And with the fulvic, there was a pretty dramatic increase in mitochondrion function that we saw on this. So that was exciting. What the researchers did was they said, all right, let's see what are some of mechanisms here.

Thinking might have been, well, this may be throughout the day of stress. It actually was not. which is, I think, very interesting because there are lots of antioxidants that are out there.

The biocarbon seems to be working through other mechanisms that can probably complement oxidative antioxidants and reductions of stress, but it's actually quite exciting to see that this is some other kind of mechanism that's working there, so Lot to, you know, these are the two.

This one's also under peer review right now. By the time this airs, it may be published, we'll see. But this gives us a lot to work with in the human studies that are also underway as of time of recording.

So did they look further into the mechanisms? Do they know anything about it yet or is that for further studying? That's gonna be for further studies.

So, I mean, we can think about what that may be. I suspect that again, there may have been some detoxification occurring with this, and that was not really assessed through oxidative stress.

We don't really know, that's what further study are gonna take a look at, including one of the ones that we have now that looks at pretty much every mechanism under the sun, this is in human beings, so we're gonna find out more in the next phase of study.

I think this is really, it's super exciting from a mitochondrial perspective, right, Chris, because we look at the fact that we know detoxification as a process is very energy dependent, requires a lot of mitochondria function, a Yet we also know that our mitochondria are very, very susceptible to toxic burden, right?

So, you know, this is really exciting that, what you and your team have looked at that isn't just that antioxidant capability, but what are those extracts of fulvic acids really doing to support the mitochondrion?

Yeah, it's a pretty bad cycle when you're immersed in these toxins. It's negatively impacted mitochondrial function. Mitochondria are needed to support our own detoxification pathways, which is why it is so critical.

If I can, I could take that and run to the human studies that we're doing now. Love it. So, uh, we're doing a study of the biotoxin binder, a product, which has some of back of carbon and some other, Uh, ingredients too.

And we'll looking at that, how it impacts true diagnostic testing, Which is known largely for its measure of biological age, making we've all seen it.

You get a. a four-year-old and two four year olds and they may have very different health, you know, and that's because their biological age is different, but there's a whole bunch of other things that are possible to look at with the true diagnostic testing.

So this study, we enrolled 60 adults And more than half of them are finished with the study at this point in time. So this is great. This is something we're going to have results.

People are tolerating it. We haven't seen the results yet, but I do know that very few adverse events with a biotoxin binder. You get some anecdotal feedback as you go through these studies too, people seem to be doing well with it, so we are going find out more.

But we may find, Emily, to your question, what are the mechanisms that are underlying some of the improvements in mitochondrial function that we've seen?

Amazing. It's always nice when you can have, again, what's going on under a microscope, but then apply it to what is happening in the human body. I think for me as a clinician, that's what I always find the most valuable.

Well, and I personally, I think it's cool because we talk so much about, you know, as you're saying, Chris, looking at chronological age versus biological age, no different than we really in our space over the past several years have been talking so heavily about the difference between lifespan, right, the number of years we live in health span.

the number of healthy years, and that it's our desire in this space to help people live that long, vivacious health span and shorten the gap between healthspan and lifespan.

But what you're saying through the true diagnostic testing and studies, that's a pretty good population, 60 people that were looking at how we truly are impacting health span.

How we're improving their biological age. That's compelling to me. Absolutely. Even on the conventional side, there's this term of compression of morbidity.

It fits pretty well. I mean, I think we're all looking for more than just not being very sick at the end. We want to thrive throughout the life. But this is something we understand.

It's not just the number of years, to your point. And it's how you are living those years. And then another one we're doing now is mentioned, kind of teed it up before, so we'll stop the tease and just talk about it, but this is a practice-based study, you know, looking at people who have elevated toxin levels, and then how do the protocols help?

So there's the bind and drain, there is the biotoxin binder and drainage activator, some people are getting that, others are the foundational protocol.

And we are going to look at, this using Mosaic's toxic testing, a lot of different toxins, you know, that we're going to look at and see how are these interplay?

What's the inter play with these? You know? And then also, what are the what the individual symptoms? How does their overall physical and mental health change?

how does there energy and vitality levels change. So we are going learn a law from this. And to Emily's earlier point, this is like this real world. This is not the tightly controlled conditions.

It's not in the metabolic ward. No one lives there. There's people out living in a real-world and really excited to see all this rolls out. Yeah, that's great.

I think I was just looking at like almost 60 different markers on the mosaic environmental tox burden profile. So yeah, quite a bit of markers to be looking.

Oh yeah. Yeah. And this includes some of the biggies, you know, the Glyph of Satan, some these other ones that we talked about before. For sure. So I have a question for both of you.

And I would love to hear this from both, you know, Dr. Emily as a clinician, right, your perspective, and then Chris, as, a researcher, but also what I really respect about you is you walk the walk, this is so, You're very passionate about this because you have seen You know the impact of the world that we live in right and as i like to say we can't avoid the exposures.

And we cant live a bubble right we could do as much as we and within our power to mitigate the damage or mitigate i should say the exposure is but. What are we long term what can we do in our lives and you're proving that so.

My question for both of you is, what would you, through specifically that study, be hoping that we answer that we haven't really been able to answer previously related to this, because you said from the very onset, Chris, that

there's not a lot out there showing what we can do to prove detox.

So clinician and researcher, what would you hope that that study is proving that, we hadn't been to show before? Emily, why don't you take a lead? I'm curious to hear your answer, so that's why.

Oh, yeah. You know, Drew, we've spoken a lot about running these big toxic burden panels. And I think sometimes we get in the weeds of like every single toxicant or toxin on there.

Do we have to use a different binder or a difference nutrient for every one? So my typical approach and what I tell my patients is very similar to what you just said.

We're never going to completely remove our exposure. Let's do the best we can. My biggest focus is how do we help your terrain help, your system work more efficiently so that that detox that bucket internally is draining faster than the exposure.

So my hope is that we find out, you know, just doing a protocol like this. That's a well-rounded, very step-by-step, there's an order to it. supporting mitochondria, opening up drainage pathways, binding in different capacities, is that going to be something that moves the needle enough to lower many different types of toxins?

Because that's typically what I say and what talk to my patients about. That's our goals, and so I'm really excited to see if that translates to the results that we're gonna see.

Right on. Well, man, I completely share those goals, too. I mean, it's going to be very interesting to see. And, you know, my sort of dovetail on those would be, one, It's gonna be really interesting, to my knowledge, this is one of the first studies of looking at a panel like this.

You know, most of the studies, including some that we've done, you know look at it at a toxin or maybe a couple of toxins within a certain class. It's going to be very interesting to see what changes we see among these different toxins together, their synergies or their antagonism between them.

So that to me is very, interesting. I think it's also going be interesting and see, well, how do these changes, hopefully, improvements in the toxins levels, married to the symptoms we were talking about.

So again, in that very foundation we spoke about before, are those, you know, when their toxin levels decrease, Are they feeling better? Again, we haven't seen, there's not been many studies on that either.

I think this is really pretty groundbreaking in those ways and others. And to add to it, one other thing as you're speaking, because this made me think of it the real life aspect of, it like we're doing either a three month and I'm participating with the practice that I am part of kind of running it.

So either the three months or the four months, like is that long enough, right? Because the reality is as that we are recruiting patients to join, things come up, right?

Like a surgery that was planned. You know, people are gonna get acutely sick. We're about to get into cold and flu season. People are going to travel.

So a new stressor comes up. How does a protocol like this fit into real world, real life? Is it gonna be long enough to see some changes? Maybe down the road we say, oh, we saw some things, but maybe if we doubled the length of time or maybe not.

But I think it'll be interesting to in context of real-life, how we see the changes happen. Yeah, that's a great point. I mean, we're also looking at, so we are looking one month or three or four months depending upon which protocol people get.

Is there any movement at one? Actually, do things get worse after one-month? I don't know. You know, like these

things we just don´t really know in any systematic way where you pool these data and look at these thing together.

So, yeah, well, what we´re gonna find out. It´s gonna be exciting. Yeah. Awesome. Super exciting. Well, Dr. Emily, I know you probably have some additional kind of closing thoughts and questions for Chris.

We could talk about this, Chris, for hours, i'm sure. But we like to keep these very, very concise and really give people some great takeaways, excitement, build on that excitement.

So I waiting to hear in the coming months the results of these studies. And certainly, by the time this is even published as an episode, we'll have all that data that's going to be publicized.

But Emily, what are your thoughts, maybe some final questions for Chris as we're closing out? Yeah, I think we've alluded to this a little bit, but I guess from the little of results that you're starting to get back from some of these studies, where are you seeing more research like this go in the future?

Is there specific gaps you see? Because I feel like once we get answers to one thing, it opens up a whole additional 10 questions that come up. So is there anything else that your seeing as you are going through this research that is kind of sparking more questions, potential more studies down the road?

Yeah, well, you know, not to get too grandiose, but I would say the fact that we're putting the common testing that We use in our field, sort of to the test here.

I think it's going to be you could say, Well, how does this impact other types of things that you look at? You know whether it is like changes you mentioned before like in the microbiome and How does that relate to other types of things?

So I think there's a lot of similar kind of systems level questions that I this sets the stage for. Because let's say that our hypotheses play out that, hey, people that are taking these, they have these improvements and these markers and some of these symptoms, but what else might be going on?

What else are we affecting? To me, I thing this whole sort of system's approach that this research supports could be broader than just what we're doing now.

Great. Yeah, that's a great point. We're looking at a lot of the toxicants, but to your point, is the microbiome changing? Are there other neurotransmitters that are changing and so forth?

So yeah, So I have a question related to that, right? Because we're talking about, you know, a lot of the markers looking, at all these metrics, so ultimately if this research continues to really support this beautiful interconnected relationship between everything we've just said, toxic burden, the gut, that the microbiome, inflammation, looking at inflammatory markers, mitochondrial function, How might that ultimately change the way practitioners think about the patient in front of them?

Do you think that's going to change how they're looking at a presenting patient? That's a great question. I would hope, and I know this will resonate with both of you, that we will start to see, by getting it published, getting a PubMed and XP-reviewed stuff, practitioners will see their patients as more than just certain biomarkers that fit a certain ICD 9 or 10 code or whatever the case may be.

So to start thinking of these broader systems and that a lot of you know, syndromes and diagnoses by exclusion, that there are things that you can do about this, so these are actionable and getting a better understanding of what's actually happening, you now, and I think even more foundational, like, these issues, whether it's inflammation or cortomotochondrial function, dysbiosis, whatever it is, they're gonna manifest differently in different people, we're going to call it a different disease, but a lot of times it the same underlying problem.

Well said. Yeah, I think that's great, especially those, you know, diagnosis of exclusion. I feel like people just get sent home and come back if you feel worse and something triggers a lab marker that tells us we should do

something about it.

Yeah, it's tough. It's not a great system, I feel like. There's a lot we can do to improve. So thank you for all the work that you do, Chris. This is very exciting.

Can't wait to see all of the published research that your doing and all their results and where things are going to go from here. My pleasure. Great to meet with you.

Absolutely. Thank you so much, Kris. And thank everyone for tuning in to this episode of The Healing Terrain podcast. We'll see you again soon on the next episode.

Bye everyone. Thanks for listening to The Healing Terrain. If this episode challenged the way you think about health and healing, please follow, share and leave a review.

It helps more practitioners and curious listeners discover the conversations shaping the future of foundational medicine.