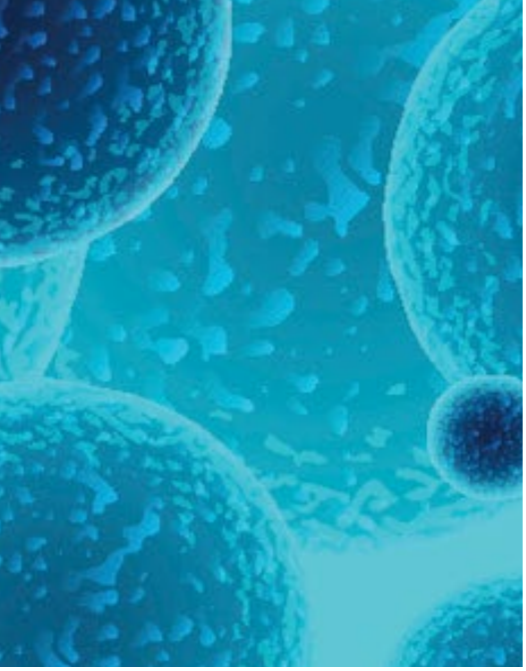
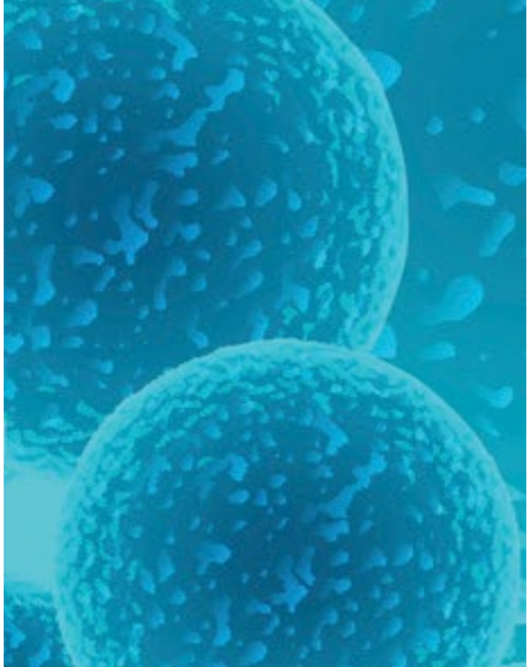
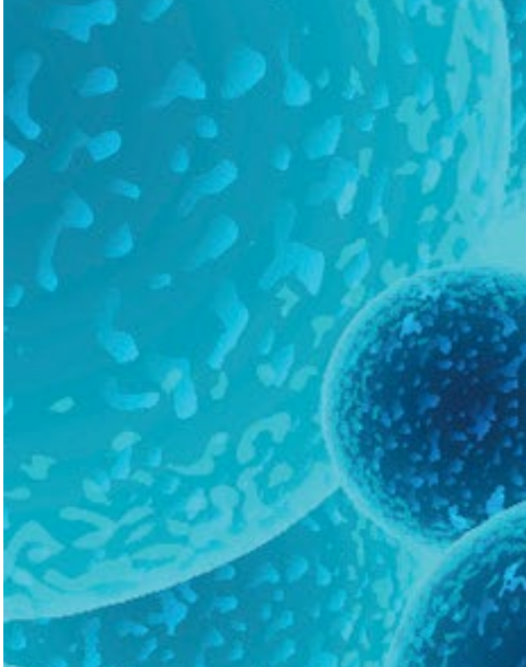

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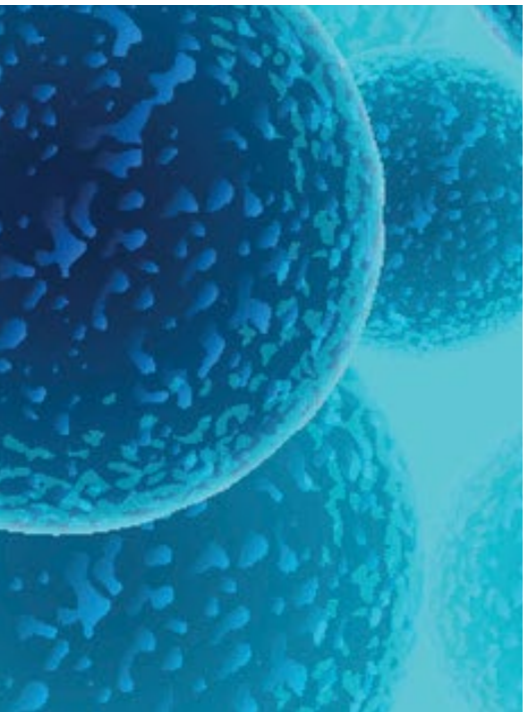
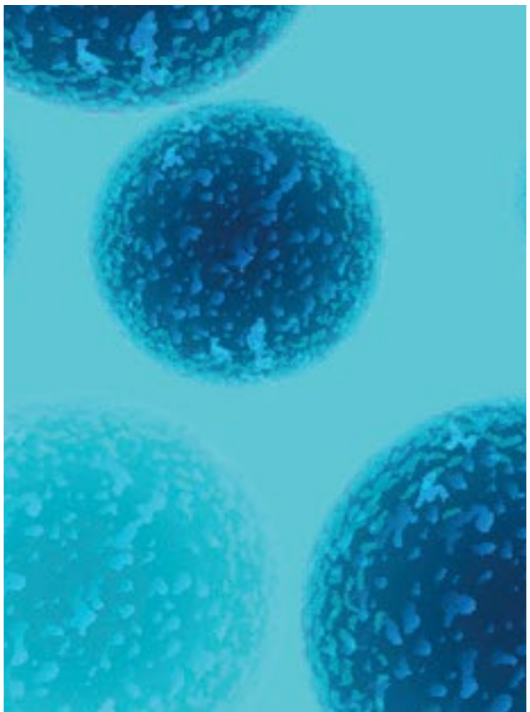
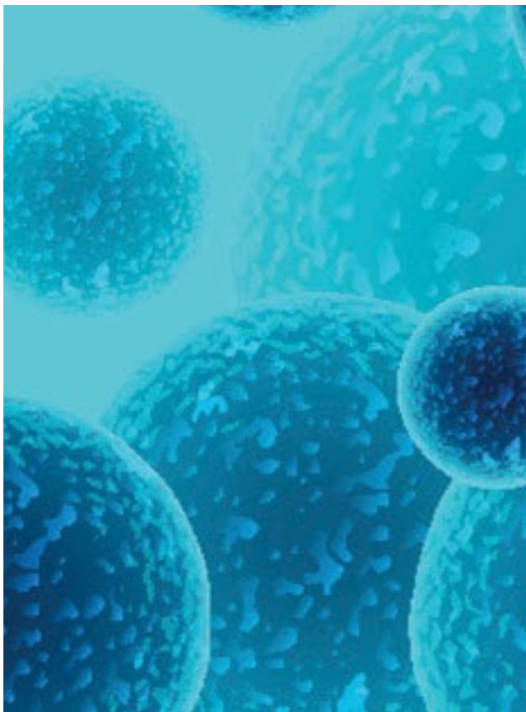

IN THIS ISSUE

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GUEST EXPERTS

- **Mast Cells and TGFB-Immune Dysfunction** from Gail Clayton, RPh, MS, CNS
  Click here to watch this interview!

- **DIY vs. Professional Inspections** from Michael Schrantz, CIEC, CMI, BPI-BA/EP
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Mast Cells and TGFB-Immune Dysfunction

Gail Clayton, RPh, MS, CNS

Dr. Christensen: This is Dr. Margaret Christensen, host of the *Toxic Mold Summit*. I'm so excited today to have my good friend and colleague, Dr. Gail Clayton, talking to us today about the immune system and mast cells and histamine, and really helping to understand the immune dysfunction that goes on with mold toxicity.

Now, Dr. Gail, besides having her own horrendous mold story, is a registered pharmacist by original training. And she has a doctorate in clinical nutrition from the Maryland University of Integrative Health, along with a master's from Bridgeport University. And she is an adjunct professor of biochemistry and clinical nutrition at Bridgeport. Now she also has a private practice, Beyondpharmaceuticals.com and also DrGailclayton.com. And she is just really an amazing clinician in terms of putting together biochemistry, organic acids, immune system dysfunction, genetics, all put together and all starting with her own story. So, welcome, Gail.

Dr. Clayton: Thank you, Dr. Christensen. Thanks for having me. I'm really excited to talk about mold illness in relation to immune function because that was like the big mystery for me when I was sick myself. I just couldn't understand what was going on.

Dr. Christensen: Well, this is a huge piece, and it's so relevant right now because now most of the country has heard about things called cytokines and immune system dysfunction because of the whole COVID virus thing. And we'll touch on that as we go through this. But we have been working together on creating an immune system module to really help practitioners, as well as any laypeople, understand in a kind of a deep dive into the biochemistry physiology and really understanding what happens in immune system imbalances. And so, we've put together some really great slides, and we're going to kind of go through those and help people understand what we have to deal with here. Let's just start here with just Dr. Gail, talking about what are the major immune modulators in the body that become affected by toxic mold?

Dr. Clayton: Well, as you see on this slide, the mold is affecting a lot of areas and a lot of systems in the body. So there's not just one solution like in conventional medicine there's a problem, and then there's a drug solution. But with toxic mold, there isn't just one solution. We have to look at what's happening in the mitochondria because the mitochondria end up shutting down. And in our immune course, we talk about, in video 2, the whole-cell defense cycle, how the mitochondria shut down to protect the cell. And then, the immune system starts becoming dysregulated as a consequence of the mitochondria going into the defense mode. And then, of course, now you've got this histamine issue because the immune system gets kind of polarized and starts releasing too much histamine.

And then, with the chronic inflammation, the

adrenal glands become very stressed and on high alert. And it's like constantly having to compensate for the excess mold toxins that are coming in. And then that causes your whole limbic system to be on the fight or flight system all the time. And then it affects your whole brain chemistry. So all of these are connected and interrelated. So a full assessment of all of these systems and looking at what we can modulate is really the answer to recovery.

Dr. Christensen: Well, that's great. So we're going focus on down here on this right lower quadrant on immune regulation and histamine regulation during this talk. And we have wonderful talks throughout this summit on brain function, on limbic system, on adrenals, on mitochondria from Dr. Terry Wahls, from Dr. David Haase, from Dr. Tom O'Bryan, from Mary Ackerley, from Annie Hopper, and Marcelle Pick talking about the adrenal hormones. So we're going to focus today on immune and histamine regulation because that's really one of the places that mold dysfunction starts. And so, just talk a little bit about this situation here because this is impacting all of us.

Dr. Clayton: Right. So when I have a client come to me, I assess everything, their whole environment. I have a whole intake form just on looking on are they using plugin air fresheners? Are they still being exposed to mold toxins? And then it's not just the mold toxins; they synergize with all of these other things that I have listed here on this PowerPoint. And then they make things even worse. And then like once the sheetrock and building materials get wet, then they leak. They actually let off even more toxic volatile organic compounds. And so now you're in a quandary of a mess.

Dr. Christensen: Well, and this is so important because, again, indoor air quality is such a huge issue. And it's one of the things that both outdoor and indoor air quality ends up impacting our lungs and our immune system inside of our lungs. And we're not going to go into that, but this was another piece of the whole COVID challenge because it was a lung issue. And so, if you were already living in a place that had very high air pollution and or indoor air pollution, that's what made some people more susceptible.

Dr. Clayton: Yeah. And one thing that people don't realize is that using fragrances and plugin air fresheners are some of the most toxic things you can do to your indoor air.

Dr. Christensen: So common. Wow. Again, the clinical symptoms of mold toxicity are vast. We can just kind of touch on each of these, but really kind of focus a little bit on mast cells.

Dr. Clayton: Yeah. Most people with mold illness end up with what we call mast cell activation disorder. And mast cells is where the histamine is stored, and mast cells line all of the mucus membranes of our lungs and our sinus cavity and our gut, all three, the whole GI tract. And that's where histamine is stored, and that's to kind of help be able to kind of cause a little bit of inflammation, bring fluids in, wash out and allow for the immune mediators to get to the site. When you're breathing in every breath, these mold toxins, that becomes very dysregulated, and you're creating a lot of cellular debris, a lot of cellular damage on those endothelial layers. And then you can see how all of that starts off affecting all of these other systems and causing all these symptoms and various organ systems.

Dr. Christensen: Yeah. So it's huge again. So we see, again, the food sensitivities, the chemical sensitivities, hormonal imbalances, everything from fibromyalgia to chronic fatigue. You can get cardiovascular issues, digestive, neurological, urinary, respiratory, immune system, again, the sleep disorders, and sinus infections. And then psychiatric is a huge piece. And throughout the mold summit, we are talking on each of these different areas. But what we're talking about here today is really the underlying immune system disturbance oftentimes involving mast cells and

histamines and understanding that piece and the imbalance of the immune system is super helpful. So tell us again about these and then we have a gift for everybody.

Dr. Clayton: Yeah. So in the first video of our advanced immune module course is going into each one of these pillars of immune dysregulation. We talk about stress, hypoxia—that's like not getting enough oxygen. What are all the things that are causing it, and what are the things you can do? And the importance of sleep. And it's not just going to sleep every night. It's the hours of sleep and how deeper sleep you get and blood sugar regulation and of course, the vagal motor outflow plays into the immune system, and how infections and food intolerance can kind of trigger like a lot of gut issues and what the immune system is doing on the immunological level that causes all of these food intolerances and how brain injury, nutrient imbalances, aging, genetic, sex hormones, how they all play into as added to the fact when you're being toxic mold exposed. Most of the time, our body is really good at kind of going in and dealing with an individual. But when you've got like a lot of them at one time, then it becomes more than your immune system can handle. And then it's basically screaming like I need help.

Dr. Christensen: So talk a little bit about, again, what are just the—— Just touch on the major mechanisms of mold illness.

Dr. Clayton: Well, in conventional medicine, they recognize that molds can cause an allergy, and they can cause an irritant effect. A lot of the irritant effects that we see is like on the eyes. A lot of times, you'll find that people they get red eyes, watery eyes, and itchy and eyelids become a little crusty. But conventional medicine doesn't really recognize the toxicity and the oxidative and the inflammatory portion or the fact that your immune system becomes so impaired that now you're at risk for lots of infections. And that's where we go into the deep dive and talk about what are the mechanisms of this and how all of these factors play in a role of making your whole immune system unable to fight infections and just chronically inflamed and how your body just becomes toxic.

Dr. Christensen: Yeah. So again, mold can act a number of different ways, both the mold itself and as well as the mycotoxin, as well as all the VOCs that come with it. And like you mentioned, conventionally, we recognize that as allergies and irritants, but the big issue that happens is this chronic inflammation that gets turned on because of immune system dysfunction that stresses out our mitochondria that makes it difficult to detox our body, and then it allows infections to happen. So let's just kind of talk a little bit about again, how does that happen when you're breathing in mold and mycotoxins? What's getting impacted?

Dr. Clayton: Well, as you can see on this diagram, you breathe it in and then the olfactory bulb, and the brain gets damaged, and then that's what sends—— It starts sending signals to your hypothalamus and then that's where your whole limbic system and your hormones are all connected right there by that olfactory bulb. And then also you end up having dysregulated hormones, and you have to really look at are the sinuses colonized. And what else are we breathing in that's adding to it because a lot of these fragrances we breathe in, they also mimic hormones and mycotoxins mimic hormones. So we're focused also on strategies of clearing out the whole sinus cavity so that we can get our limbic system and our hormones back into balance.

Dr. Christensen: Well, I've got a great talk with Dr. Donald Dennis. He's an ENT talking about all the sinuses, and also Tom O'Bryan is talking about the breach of brain barrier. So what you're saying is that the limbic system becomes attacked. And then that's what starts the whole cascade of stress hormones and inflammatory cytokines being made in the sinuses and brain, as well

as in the gut. And talk a little bit about all the hypersensitivities we see.

Dr. Clayton: Yeah. So like the limbic system on top of the brain, it's breathing in. And so, it's on high alert all the time, and that's addictive, and the next thing you know, you start losing oral tolerance. You'll start like losing your ability to eat certain foods. And I've had clients that have come to me, and they can't eat one thing. And that's the point where we have to get really aggressive, and I have to refer them to somebody that can do some IV-type therapies and really focused intense therapies on, but then you also get sensitive to chemicals. And the thing is like you're breathing in the chemicals, or you're putting the chemicals on, and our immune system has to figure out how to get rid of it because it recognizes it as not part of cells.

So you're activating your immune system with every chemical exposure. And so, with the turned-on limbic system, this is exciting it even more, and more stress chemistry is being released. And then, of course, our blood-brain barrier becomes damaged because of all of the inflammatory and immune mediators are able to cross now that really shouldn't. And even things like radio frequencies, EMF, electromagnetic frequencies can cause the limbic system to fire off more stress chemistry.

Dr. Christensen: Well, and we have a great talk with Dr. Stephanie McCarter talking about the role of the EMFs in all of this. So again, kind of the big point here is that our limbic system in the brain becomes activated, and this becomes part of the whole immune system dysfunction. And then we end up getting—we can depending on how long somebody has been exposed and their genetics, and a lot of everything else—multiple chemical sensitivity, and then sensitivities to lots of different foods. And a lot of that is histamine related, which we're going to mention here in a minute, and again, what can we do with those. So what are some of the other things that again, mycotoxins can do?

Dr. Clayton: Well, one of the modules I go really deep into talking about exactly what the mycotoxins, all the systems it affects, but today I just want to talk about the glutathione and the TGF-beta. They're kind of like a teeter-totter, and it really messes with the—— We are under so much oxidative stress that we're using up all the glutathione. And then we release a lot of TGF-beta, and we'll get really deep into explaining that whole mechanism. And then, of course, the mycotoxins have an evasion strategy. So they want to hide from our immune system and establish themselves as commensals. And so, they have a way of like pushing down the innate immune system so that they're not recognized as pathogens. And so in the process, when the innate immune system gets pressed down, it doesn't recognize other pathogens, too. So we lose our general housekeeping chores of immune surveillance by the innate immune system. And now our viral titers go up. We get sick all the time, and we're just chronically inflamed.

Dr. Christensen: And we've got a great slide that shows that. And then we're also going to jump into kind of the TH2, TH1. So again, mycotoxin exposure can impact many different metabolic systems in the body, but we're just going to kind of just touch on at a surface level the glutathione, TGF-beta, talking about innate immune system, and then TH1, TH2 imbalance and just touch on the vagus nerve and how it's important here.

Dr. Clayton: Yeah. So the vagus nerve is connected to the gut, and its job is to regulate digestion. And so, we want a proper vagal motor outflow, and when we're chronically inflamed, there's like a block to the vagus nerve. So we're losing that communication, that gut-brain communication. So now you've lost your intestinal motility. You're not creating enough gastric acid. You're not making digestive enzymes, and you've lost your protection against the liver. And so now your liver can become very inflamed, and there's

a lot of things that the vagus nerve does that's very protective. So we have to work to restore the vagus nerve function.

Dr. Christensen: And again, we have Dr. Leila Doolittle talking about that on her discussion. So the limbic system and the vagus nerve are all part of helping to regulate the immune system. And the vagus nerve gets a lot of information again, from the immune system cells and the mast cells in the gut. And that's what gets translated up to the brain. So, absolutely it's really important in understanding immune dysregulation and helping to fix it. And it's so cool. We can fix it doing that. So talk a little bit just briefly about what are the two different branches of the immune system?

Dr. Clayton: Well, we have the innate immune system, which you can see the cells on the left, and they're just basically phagocytes. They go around. I like to label them like Pac-Man. Remember that old video game? Pac-Man just goes around and just gobbles up everything. And they basically eat dead and dying cells. They eat anything that comes in the body that's recognized as foreign before they get, that pathogen or that chemical or whatever before it's able to get inside the cell. Okay. So then it bites it up and has all these nasty enzymes that liquefies it, and it puts pieces of that antigen on one of the adaptive immune cells.

And then they crank up production of helper cells, CD8 cells, and antibodies to go after and it'll go, and it'll kill the entire infected cell, and it'll kill the pathogen inside the cell. And so, they have this cross-talk. And so, we go into depth, and I think it's in video two about the innate and the adaptive immune system and the cross-talk and what happens when that antigen comes in the body. It's all animated. When the antigen comes in the body, it goes through this process, and that's how the immune system gets activated.

Dr. Christensen: So again, the innate immune system is kind of like the ground troops, and they're constantly surveilling for bad bugs, viruses, cancer cells. And then, if they find something, then they turn on the adaptive immune system, which is more like the special forces. The special forces are what make antibodies. And they're what are producing a lot of these cytokines that everybody's been hearing about. Many of them come from these T cells. And we're going to talk about T-cell dysfunction in just a second. So here's those mast cells that we talk about. Those are part of the innate immune system. That's what's releasing histamine. And again, there's many different types of innate cells, but we're going to focus on this one, and on the TH2, excuse me, the T cell polarization. So tell us a little bit about the balance between these two things.

Dr. Clayton: Well, we really want a balance between the innate and adaptive. As we get older, we just naturally have our innate immune system naturally kind of declines. And then now the adaptive immune system has to do a lot of the heavy lifting, but the problem with that is that's how autoimmunity starts. So anytime you can kind of let the innate system do most of the heavy lifting, then the adaptive immune system doesn't get turned on, and you have less risk of autoimmunity, but it's going to swing back and forth. We need the adaptive immune system because like if we get an infection, we need to clone out those cells to go and attack those infected cells to get rid of it so that the virus or bacteria doesn't kill us, but just for everyday life, we run a really good, healthy innate immune system. And there's a lot of things that you can do with diet and nutrition to really optimize that. But a lot of toxins and stuff can damage our innate immune system, too.

Dr. Christensen: And it's kind of coming back to the whole COVID issue. One, what we were seeing is the adaptive immune system, again, the cytokine production, the antibody production just going crazy, and the innate immune system being suppressed. And we have a slide about that again. So not picking up the virus and the virus turning on this big cytokine storm. So there's ways we can

modulate that. And that's what's so important to know,

Dr. Clayton: Exactly. And the people that had worse outcomes, in my opinion, the people that have worse outcomes were the ones whose innate immune system was not working well, to begin with. So now you get all the cytokines from the adaptive immune system that you see here on this slide with all these T-cells dysregulation, right here. Yeah. All of these cytokines are like going out, and now they're just causing a lot of damage on the epithelial lining of the lungs and in the heart. That's why you're hearing about a lot of heart issues, stroke, and lung not being able to breathe because it's all of those tissues lining the surface that are becoming damaged.

Dr. Christensen: So we showed in that first slide. You have the innate immune system kind of identifying what the problem is, and it tells the adaptive immune system, hey, make some specialized cells to go after that. And we call that T-cell polarization. And that's what this slide is showing that you have different ways that the T cells can differentiate. So you want to just briefly touch on what are the different forms of T-cell polarization.

Dr. Clayton: Yeah. So there's several. This is the T helper cells, the CD4 T-helper cells, and depending on what type of antigens—— So if like TH1 is secreted in response to bacteria and virus and some fungus and then TH2 cells are made, and those cytokines are made in response to parasites, allergies, and any like when we're breathing in mold toxins, that gets like excreted. And that's basically when you have a TH2 polarization, it always has to do with the hollow spaces of the body. So like the sinus, the lung, the gut, the bladder, those types of areas are where all the T helper two cells are pretty localized. And then the Th17 is basically the autoimmune pathway, but we use those Th17 cells in our gut because that's when pathogens enter our body, and we have to activate those Th17 to kill pathogens on our food.

And then we have the T regulatory cells, and that allows for tolerance to our food. Okay. But with all three other polarizations, we're going to have T regulatory cells produced because it's going to say, whoa, hold off. Don't like make too much. It's a way of regulating the inflammatory response and reigning in the inflammation. And so, you've got this interplay between all four of those. And then the bad thing is that you can trigger one of these polarizations and it should come back to normal, but sometimes they get stuck, and they start self-stimulating. You can't get out of that loop without help.

Dr. Christensen: So, in other words, depending on what type of pathogen it is, whether it's a virus or bacteria, that's more likely to turn on the Th1 cells. If you have mold toxins, antigens, allergies, as well as parasites, that's going to trigger Th2 cells. And we see that a lot. And then Th17 is produced with a lot of inflammation and autoimmunity, and the T regulatory cells produce particularly something called TGF-beta. All of them produce a little TGF-beta, but that's what slows things down. So we're going to talk about TGF-beta because a lot of people have heard that as something you measure in mold toxicity, but they don't understand what it is. And then we'll talk about how the T cells are impacting histamine and mast cells because that's such another big topic. So just tell us a little bit about what is the benefits of TGF-beta, and why are we trying to make it?

Dr. Clayton: Okay, so TGF-beta is a T helper cell. It's a regulatory T cell. And it's always secreted with inflammation, and we need it. So whenever we get wounded, it's there. It brings all the materials to the site to repair the wound. It helps bring collagen in, and it restores tissue strength and integrity. It helps protect the heart and the epithelium, and it's activated by free radicals. Okay. So we absolutely have to have TGF-beta, and it allows for tolerance for our foods. Now, when we are chronically inflamed and mold toxins

you're breathing in, that's like extreme amount of inflammation. Now, the TGF-beta—— I mean, the body's in stress, and lots of TGF-beta is secreted everywhere. And so, it can cause fibrosis and scarring because it's bringing in all of this collagen and all this repair material. And you'll see people that have like cysts all over. Fibrocystic breasts, as an example of too high of TGF-beta. You're going to get diseases of the lung, heart, liver. You've heard of people getting like scarring of the lung tissue, fibrotic lungs, too much fibrosis in the heart and the liver, uterine fibroids, scleroderma, and even neurofibromatosis is basically TGF-beta gone wild.

Dr. Christensen: Wow. So again, TGF-beta is supposed to be normally produced in a healing circumstance. It helps to again bring in all the components to help heal tissue, but when we've got too much of it, that's when you get a lot of fibrosis and scarring. And there's a lot of different things that we can do to lower TGF-beta. And so, you can just touch briefly.

Dr. Clayton: Well, it's interesting. I recently had a client, and I talk about this case, I think, in module six, I mean video 6, about a lot of things that we're doing that, are just keeping TGF-beta high. So when you're looking at somebody that has a very high TGF-beta, you have to look at all of these things, there's things in your diet you could be eating, causing it to be high and probiotics and certain vitamins and all of that can cause it to be high. And then depletion of NAC and glutathione. We want to look in all of that. We want to look for signs of fibrosis and scarring. And then, high TGF-beta has an impact on our glutathione levels, our innate and our Th1 support, and the metabolism of tryptophan. All of these are kind of related and modifiable as well.

Dr. Christensen: So we can learn how bring down TGF-beta into appropriate ranges by working with diet and specific nutrients, and also the order in which we do those are important. So just talk a little bit about what happens when we have again, kind of chronic mold toxicity. So you've talked about the different polarizations of the cells. What do we typically see with mold toxicity?

Dr. Clayton: Well, just like here, you say this teeter-totter where you get a chronically elevated Th2, and this is the thing. Th2 polarization and you get a lot of dysbioses and scarring and all of that in the gut or in the lungs or sinuses, anytime you're chronically inflamed, that polarization can combine with the Th17 autoimmune pathway polarization and stimulate autoimmunity or an autoimmune like process that is actually kind of measurable just even in conventional labs. And we kind of talk about that in video four on what type of patterns to look at to see what polarization your immune system may be.

And the thing is Th1 and Th2 are a teeter-totter. So when Th2 is elevated, it's going to push down Th1. And then Th1 and the innate immune cells, they're kind of like first cousins. So they typically kind of go up and down with each other. So we want a really strong innate immune system, and we want a balanced Th2 and Th1. So some of the things that we talk about in the course is how to kind of block that Th17 pathway and how to kind of decrease that Th2 and how to support the Th1 and the innate so we can get immune homeostasis. If you can get immune homeostasis, I guarantee you you're going to feel a whole lot better.

Dr. Christensen: Yeah. So again, the important points that we touched on here is when you have too high of a Th2 and Th17 and a suppressed innate immune system and Th1 cells, then you're more likely to get more infections. And you already mentioned about the hollow spaces and having problems in the sinuses, the gut, the bladder. And again, this is where we see the dysbiosis. Then if you have SIBO, SIFO issues, that's a Th2, Th17 dominance usually, and then we've already touched on food sensitivities and these chemical EMFs sensitivities, but also a psychiatric component is another huge piece.

And certainly, we see this all the time. I see this all the time in practice where folks come in, and they have chronic reactivated infections, or they have a diagnosis of Lyme or one of the co-infections, and it's really if you get a good history on them, they have toxic mold exposure underneath. I just want to point out here, too. Interstitial cystitis is another common finding with chronic fungal exposure, whether it's yeast or antibiotics also besides mold. Have you also seen that?

Dr. Clayton: I've had a few clients with the interstitial cystitis, and yes, it's a common problem because it's one of the hollow spaces, and that is a very painful condition and pretty difficult to treat.

Dr. Christensen: Yeah. I meant, just have you seen the whole issue with other infections?

Dr. Clayton: Oh, yeah. You'll see high viral titers and all of that happening.

Dr. Christensen: Again, there's certain markers that we're looking for. We don't have time to go into all those, but these are just some common things that you can see on a routine blood work. What are the highlights?

Dr. Clayton: Well, the on the things that are high, the thing I want to look at is high eosinophils. If they're high, then that means that you basically have a Th2 process going on, and elevated neutrophils is a Th17 process going on. And of course, all of these other ones that are listed there, they're basically a measurement of inflammation, damage to the tissue and lipids, and in cell membranes.

Dr. Christensen: And then oftentimes we'll see the low fat-soluble like LOD, LOA, N-acetylcysteine, glutathione, those are all measurable ones in kind of some of the various tests that we do. So that's some of the patterns that we see. And then there specific nutrients that can help bring down Th2 and support Th1. And again, putting those in the correct order can be super helpful. What are some of your favorite ones?

Dr. Clayton: Well, of course, you want to try to—— First thing you want to do is you want to see what foods are they eating that could be pushing the Th2. And a lot of times I'll be looking at their diet history, and they're having like a smoothie every day with all these berry antioxidants or taking some kind of antioxidant that's like all berries. And while berries are really helpful, if you're in a Th2 dominance, that can just kind of keep you stuck and keep that autocrine cell stimulated going. There's some things you can do to block Th2 that I have listed here on the slide. Some perilla oil, selenium, and fish oil. And then, of course, for mast cell, some polyphenols. Polyphenols are so fantastic. Quercetin and nettles and then a product called ImmunoThrive that I had developed and N-acetylcysteine, those are all really good Th2 modulating nutrients, and then, of course, there's the cheese that you can drink. They are full of polyphenols—like hibiscus is probably the cheapest and one of my favorite teas. I have people just make a pot of hibiscus tea every day and drink it for the polyphenol effect and helping to stabilize the T cell polarization.

Dr. Christensen: That's great. That's a simple one. I had thought about hibiscus tea. Yeah. So let's then kind of move into mast cells because again, we've covered the innate and the adaptive immune systems and how again, adaptive can polarize into these different types of T cells, which then feedback, and then can turn on mast cells. And you had already mentioned that these are the things that we see, food intolerances, digestive diseases, lots of allergies, and chemical sensitivities. So those are all signs and symptoms of mast cells. And what are the things that mast cells release?

Dr. Clayton: Oh, well, mast cell release—— The main thing they release is histamine, but it also releases a lot of other inflammatory cytokines. And then, the interesting thing is mast cells can cause the Th2 to release more cytokines that stimulate mast cells. So then they get into this light little dancey loop, but it stimulates

leukotrienes and platelet-activating factor. So now you're going to see high platelets, and that will activate Th17.

Dr. Christensen: So again, for people who are interested in understanding more about the whole process that happened with COVID, too, that's a whole lot of what was going on here is that you have this mast cell activation and a micro clotting going on, platelet-activating factor as well. So you can see how air quality issues and mold might predispose people to having more serious infection challenges. And so, tell us what this is.

Dr. Clayton: Well, okay. So this is like a depiction of a mast cell, and you see those little Y structures, those are IgE. The mast cells can become preloaded with the IgE, that's the antibodies. And then you can see those little green things with all the little spikes on it. Those are the antigens. They're coming in, and instead of it going through this whole process of being phagocytized and go present to the T helper cells, they can go directly now because the mast cells are lining your sinuses and your gut.

So the antigen comes in, and the mast cells are already preloaded. The antigen touches it, and now those granules fall off, and all of that histamine is released, and that's what's causing the massive inflammation and sinus congestion or like severe abdominal pain. Some people can be bent over with pain. Yeah. And here's the slide that we had made just kind of putting some—— There's so many symptoms. I tell you, people have like mystery illnesses. They go to the doctor, and every time they have a mystery illness, it's almost always mold because look at these symptoms here. It is just massive. Everything has gone—— Anything that could go wrong is going to go wrong.

Dr. Christensen: Yeah. So again, this is mast cells that you said that, like in the previous slide, had been preloaded or pre-triggered with the antibodies now stuck to the surface to what they've been exposed to in the past. That's the adaptive cells told the mast cells, hey, get ready next time this comes around and boom. And this is where we see again, all the sensitivity in migraines and psychiatric symptoms in the SIBO, SIFO issues, and even things like psychosis and bipolar and schizophrenia, which we have Mary Ackerly and others talking on, and then, of course, all the respiratory issues and skin issues. So it's a huge piece. And it's just important to again, for any of the practitioners to know that there's two major pathways. So if you just very briefly touch on those two pathways of how histamine is metabolized.

Dr. Clayton: Yeah. So in video 6, I go really intensely into the whole metabolism of histamine and all of the different factors, but basically, histamine is metabolized by two pathways. So in the gut, we have an enzyme called diamine oxidase, and we abbreviate it DAO. And there's a lot of factors that can determine whether you have sufficient DAO. And we get more into that, but here I just listed a couple of things that there could be some genetic issues that maybe you're not making enough DAO. And then maybe if you're B2 deficient, which is the co-factor for DAO enzyme and dysbiosis, it can impair DAO production.

And there are DAO enzymes available that you can take to kind of help support the metabolism of histamine until we can get that working right again. And then the rest of the body, intracellular and in the central nervous system, there's an enzyme called histamine and methyltransferase that breaks down histamine. And that requires proper methylation. Some of you may have heard of MTHFR and B12 and folate, which is involved in the whole methylation process to break down histamine. And in that pathway, we have several vitamins and minerals that we have to have onboard in order to break down histamine properly, which we listed here.

Dr. Christensen: Well, it's interesting because you also taught me kind of how to use riboflavin

or B2 in all this, and I've already been using some of these other things here. But again, these are important factors when we're dealing with histamine with clients. And I know that we have a special histamine assessment form. And do you want to just kind of briefly mentioned that? So that's part of your gift for doing this topic.

Dr. Clayton: So when I was putting together video six about looking at all of this, I mean, all of the little details that you have to look at, I was quite overwhelmed, and I thought, I think I just need an assessment form just to like organize my thoughts. So I made this massive assessment form, and I started using it in my clinical practice. And I'm like, this is amazing because as you go through each one of these pathways that I teach in video 6, you'll understand all of the mechanisms and everything.

And then when you have it on this form, and it's checked off, it helps like organize your thoughts and hone in on a particular mineral or a particular enzyme or a particular area of like what could be causing it because it's not just—— Either you can't break down histamine, or you're releasing too much histamine. So maybe it's not really a mast cell per se issue. Maybe there's other factors that are just causing lots of complexes and irritating those mast cells in the gut to release too much histamine. And so, all of those factors are taken into consideration, too, for example, like do you still have a gallbladder? If you don't have a gallbladder, you are trickling bile, and that's causing a release of excess histamine. So what can we do about that? So I made this massive histamine assessment form.

Dr. Christensen: Yeah. So, I mean, this is a huge issue, the whole histamine challenge, and what to do, how to treat it, what to use, what medications, what nutrients, et cetera. For those of us who are the clinicians in the international society for environmentally acquired illness, this is one of the frequent topics on our LISTSERV about how to deal with, again, these super sensitive patients and high histamine levels, et cetera because we see this so commonly. We also have Dr. Neil Nathan describing the hyper super sensitive patient and his approach. So there's lots of different over-the-counter things we can utilize, prescriptions as well as natural botanicals to help squelch the histamine. And we have mentioned some of those already in various different talks. And Dr. Nathan goes through some of these as well.

Dr. Clayton: Going back to that, when I get a super sensitive client, and I assessed everything, I have to use a combination of all three of these pillars here. And one of the interesting things is when they are super sensitive, you have to think about the cell membrane and the cell membrane damage and the calcium and the sodium. Okay. Yeah. Here's the slide you were going to talk about next. But the potassium and sodium pump or the osmolarity, just like fixing the osmolarity of intracellular and extracellular, can be huge. And that's why potassium, just something simple as an increase in potassium, can help stabilize that cell membrane.

Dr. Christensen: Well, and that's again a huge piece, and we had put together kind of an immune system introduction for when the whole COVID thing happened. And we were talking about cell membranes and the integrity of that, and how important that is. And we have Dr. Kelly McCann talking about these phosphatidylcholine and other things, and you taught me all about tocotrienols, which is a form of vitamin E. So again, we've already mentioned all of the important things that you should stop doing or change to help improve cell membranes because that is also very related to the whole histamine issue that we just mentioned. So I just wanted to have you just briefly comment on niacin because you really taught me about niacin and look at all these different symptoms that are impacted by when you have niacin that's deficient.

Dr. Clayton: Well, this is the thing about niacin

is so critical. People are scared to take niacin because they've heard about MTHFR. It makes you like under methylate, but that's typically not the case in low doses and with mold illness. And the way that the mitochondria is connected to glutathione production and the way the—— and into killing of pathogens of the innate immune system, that whole triad there, which I go through, I think in video 4 of the course explaining this whole oxidation-reduction and niacin becomes depleted in the tissues and in the mitochondria.

And so it basically donates this proton to help make glutathione. It's needed to help the innate immune system and help to clear out tissue debris, help restore mitochondria function. And so, a lot of times they're niacin deficient when they say, oh, I can't take B6, and that's a whole another biochemical pathway.

And niacin deficiency is going to show up in a lot of ways. We call it the 4Ds: dermatitis, diarrhea, dementia, and death. It causes a lot of psychological issues. And so, I go into that deep in video 4, talking about how to assess that.

Dr. Christensen: Yeah. So niacin is involved in the energy cycle production in the mitochondria. And so, it is going to impact many different symptoms. And I just started taking extra niacin myself, and it made a huge difference for me and my fibromyalgia and some of my fatigue issues. So that's great. So, where do we start? I mean, this is a big ball of wax. What do we do?

Dr. Clayton: Exactly. Well, in medicine, you always have to find the triggers and remove it. I mean, you can throw supplements at a problem all day, and it's not going to fix it. In conventional medicine, the doctor walks in with his prescription pad. He can write prescriptions all day, and it's never going to fix the problem until you remove the problem first. So, of course, you have to remove yourself from the toxin exposure. I just had a client last week, and her and all her family are having all these issues. And I said, I think your toxic mold poisoned, and sure enough, she did the test. Boy, she was out of there by the weekend. She says immediately I felt so much better. And you got to remove the foods that are causing inflammation.

You got to remove the toxic products in your life, clean your air, indoor air quality, get rid of carpets if they're like old and massive, fix your gut, and retrain your limbic system. So that's got to be the very first thing you do.

And then you can focus on repairing the gut. That's where you want to focus on fixing anemia and blood sugar problem because that's going to affect your oxygenation and being able to restore your tissue and cell membranes, and we go into how to restore cell membranes in the course.

And then, of course, then you want to restore the immune function, and we have special specific things that you can do to assess what kind of polarization you're in, what's going on with your inflammation, what tests to look at, what tests to order, what do those test results mean, and how to get back into homeostasis.

Dr. Christensen: That's great. So remove, repair, restore, and again, for folks wanting to—— Who don't have a practitioner near them, or even for practitioners who are just trying to learn, Gail and I last year tried to put together a very beautiful but simple presentation on teaching folks the different forms of diet and different simple techniques to clean up our environments. And as well as again, learning a little bit about histamine and cell. So that's what's the mold detox diet, and that's also available as part of the mold summit as an upgrade. And then it also comes if you end up getting the whole advanced immune module series—this will come with it. And it's an amazing resource. So Gail, how many hours did it take for you to do the——

Dr. Clayton: The immune module?

Dr. Christensen: Yeah, do the——

Dr. Clayton: It is like my teaching job and seeing

clients, but this has been a full-time job for over a year. Yeah.

Dr. Christensen: So we gave you today just really a taste of what happens to the immune system in toxic mold exposures and understanding this imbalance between Th1 and Th2, and the histamine and mast cell response and how to get those things under control. And that's the way we can heal ourselves and Gail, that's how you healed yourself, right?

Dr. Clayton: Right. And the immune system is quite complex, but when I designed this course, I really wanted it to be simplistic enough for even the layperson to watch it. The videos are professionally done and animated. And I think that really concentrated in learning that there's a lot you can get from this because honestly, most people can't afford to see people like me or Dr. Christensen or some of the other professional doctors that she's had on the mold summit that actually help people recover. And there's a lot of things that you can do on your own. And it's just having the information, knowing where to go. I think if I had had this before I had changed careers because I changed careers because I was looking for answers. I couldn't find anybody to help me.

So I had to become the type of practitioner that I couldn't find. And so, from all of my years of my journey and the mistakes I've made and what I've learned along the way, I put together this course, so you don't have to go through all of that like I did. If you get the course, and I think if you purchase the transcripts and study it—we have about 60 handouts that's going to come with it—I think that you can really kind of do a lot of the things. And I've had some laypeople watch it, watch some of the videos, and they thought it was very understandable and easy. No one said super easy, but they said, yeah, I kind of had to study those videos a few times, but it was so fantastic. They didn't mind watching it over and over.

Dr. Christensen: Well, thanks, Gail, so much for your expertise and your knowledge. I mean, you've taught me so much about really understanding how to approach, especially the difficult, challenging patient who's already seen a lot of other practitioners and is stuck. And so, I think this is a really beautiful step by step way we can go through this. So thanks so much, Gail. And where can people find you?

Dr. Clayton: You can find me on my website, DrGailclayton.com. That's D-R, and then my first name G-A-I-L, Clayton, C-L-A-Y-T-O-N.com. And then, of course, you can join my Facebook group. You can find the link on my website, where I'm there all the time and entertaining my followers.

Dr. Christensen: Thank you so much, Gail.

Dr. Clayton: Okay. Thanks, Dr. Christensen.

DIY vs. Professional Inspections

Michael Schrantz, CIEC, CMI, BPI-BA/EP

Dr. Christensen: Hi. This is Dr. Margaret Christensen, host of the *Toxic Mold Summit*, Toxicmoldproject.com. And I am so excited to have an amazing indoor air quality professional, Mike Schrantz, from Environmental Analytics talk with us today. And Mike is one of the founders of Environmental Analytics, and his company really offers this comprehensive indoor environmental quality assessing not just for mold inspections but also VOCs and other things, a wide range of environmental assessments for residential commercial, and also the medical sector.

So, he's got a lot of experience in those things—twenty-three years of active indoor environmental air quality and building science. And the building science experience, we'll talk about that in a minute. Okay. That's really super important. And he has been involved in over 4,500 different projects around the globe. He's a certified indoor environmental consultant. He's got accreditation through the American Council of Accredited Certification and carries lots of other multiple certifications in environmental fields.

He is one of the indoor air quality professionals panels with Surviving Mold and also is a founding board member of the International Society for Environmentally Acquired Illness or Iseai.org, I-S-E-A-I.org, which we have a bunch of amazing founders and faculty people, and again, members on this summit because I think it's such an incredibly important organization. And Mike is the host of the IEP Radio, which is a free educational resource for patients, clinicians, and IEPs, that's Indoor Environmental Professionals, covering a wide spectrum of topics, everything from microbial remediation, sampling, and many interviews with some of the leaders in functional and diagnostic medicine. So, welcome, Mike. I'm so excited that I got you on here.

Mike: Thank you for having me, Dr. Christensen.

Dr. Christensen: Okay. And so, we're going to be talking today about both home assessments, what people can—— Some of the testing that's available for homes and some of the pros and cons of that, and then really calling in a professional and what a really quality professional should be looking for. But I think we can start with just—— Let's start with how do you have somebody assess their home or somebody that you're going to go and look in their home? What kind of history do you have them take on their house, and what are the things that you're telling them to look for around their house?

Mike: Certainly, when someone's first reaches out to us, it's not much different than a client intake that a clinician does give. You find out why are you calling me in the first place. Well, I have a mold exposure concern if we want to use that. And then certainly it is a history of the home. What can you tell me about the home that you know has occurred or areas that you're suspicious about? All of that information ends up leading into trying to figure out when we ultimately step foot in that home or perform a virtual consultation, what are

some of the tools, what are some of the things we think we're going to run into as an inspector?

Dr. Christensen: Okay. And we'll talk in a minute about what again, looking for quality inspectors and how to find them. But a lot of times it's hard to get people to even think about having somebody come in their home or have an inspection or whatever. And so, there are a few tools that are kind of DIY tools that yourself—— So can you mention a little bit about those and talk about maybe some of the pros and cons and also professionals also use these as well or some of them, and so maybe you can talk about them?

Mike: No, absolutely. I think DIY is a fair topic. My personal opinion, DIY testing can be a good option for some people, especially for those who are kind of on the fence regarding their exposure, or to be honest with you, in my experience, DYI sampling ends up being really useful when there are spousal challenges. The classic case of the husband or the wife who's not on the same page, and they're not willing to spend money to have a professional like clinicians we work with certainly come out in the field. So there are various types of DIYs. Probably the two most popular methods are either ERMI sampling. People know these as dust samples. ERMI stands for Environmental Relative Moldiness Index. We can talk more about that in a little bit. And also, Petri dish or mold plates to some that you can get. Each has their pros and cons.

And I think the takeaway, and I'm happy to dive into some of the details of those is that they should be used as an initial step to get a better feeling of, do you really think something's going on in the home? In other words, you wouldn't leave it to the homeowner to diagnose and treat themselves. You wouldn't leave them to diagnose and treat the home because there are a lot of times what we find is yeah, maybe they can identify an obvious mold problem underneath the kitchen sink cabinet, but there are other areas, there are other challenges, number one, that they might not be able to identify and two, how to fix them. So DIY ends up being a great starting point and certainly happy to talk to you more about some of the DIYs.

Dr. Christensen: Okay. Yeah. So let's talk a little bit about those. I mean, I think you made a lot of good points that again, oftentimes, I'm telling folks, hey, I want you to take home these mold plates, and we can talk about also the quality of those. That's also super important if you're going to be doing them or using them. And the second thing is getting some dust sampling because that can tell you a little bit more about the history of the house and what's going on, and that can often lead to again, maybe having a more professional assessment. So why don't you just talk about the difference between using the mold plates and then using ERMI sampling? And then we'll also talk about air sampling, but it's usually what the professionals do. Although there are some now home air sampling kits, too, so maybe you might touch on those first, too.

Mike: Sure. I'll do my best. Mold plates for starters, we'll talk a little bit about what are the pros and cons. First of all, it's easy to enter the market with those. They're relatively cheap, and there are laboratories out there that offer these kits for a relatively affordable price. Petri dishes are challenging because they are limited, as are all testing methods. They're limited for the reason that they don't identify non-viable exposure. So if you have a mold spore that's viable or able to grow on the ager that you happen to have on that Petri dish, and there's usually multiple agers that you could use that help invite growth of various species then it will grow. The problem is that the studies indicate there's a lot of fragments and stuff that are also present that are not going to be—— That are not viable and won't grow.

And so, you end up missing something in the case where a Petri dish sample may be comes back with nothing on it. You start to wonder, well, maybe it's an old source because my clinician

is also saying they still think there's exposure. Maybe there's some symptom that you're basing that off of. The other thing to consider is that with mold plates, even if it does come back positive, a lot of folks that I'm working with who have collected them don't know what's normal for their home. It's not about a mold-free environment. As I'm speaking, I'm breathing in mold spores, mold fragments, mycotoxins, bacteria from the outside. So it's not a microbial free environment. It's more of a normal microbial ecology, which varies from home to home, from situation to situation.

So on settle plates or Petri dish samples, I think the takeaway is that you can look for trends if you suspect that a master bedroom might be an area of exposure and upon getting the results back, the master bedroom shows almost an order of magnitude higher result than the other areas of the home. That might be a yellow flag for the occupant to go, hey, you know what? We need to take a look at this further. When you switch to ERMI samples, the downside to those right off the bat are price. Compared to Petri dish samples, they're relatively more expensive. The other issue is the challenge of interpretation, which I'll get to in a second, but the whole point about ERMI samples and I want to clarify something about that is that you're taking a look at the history. What was in the air is the argument to be made.

And ERMI uses a process called QPCR or Quantitative Polymerase Chain Reaction, a tongue twister, and it looks for DNA. And so, it can identify fragments. It identifies viable and non-viable, which gives you a bigger picture and in a more forensically picture of what exposure may be occurring in the home. The challenge, I think, and something that I really was wanting to talk with you about today. I think one the biggest challenges with ERMI sampling is really the misunderstanding about how these samples are actually being used in the field. Many professionals like myself would agree that when you're doing an ERMI sample, you're not supposed to be using the graph. Even the EPA came out with a letter that says this is for R&D purposes only. However, there has been other professionals, other clinicians—a lot of folks know Dr. Richie Shoemaker—and there's other pioneers in the industry that have used their own metric that are well known to say, hey, if your ERMI score is over a two, or if you have an ERMI score, and it's this score below as kind of a clinical indicator of whether or not this environment might be safe or unsafe.

The problem is that beyond the scores, they're not always correct—nothing's 100%. So somebody can come in and get a good score, but yet, which would they think there's no exposure, but yet every symptom, every biological marker, maybe it's a urine analysis, maybe it's a blood marker, maybe it's NeuroQuant, whatever it may be is indicating exposure and perhaps in that home. You have to be careful as a homeowner not to overanalyze or conclude a result.

Conversely, I've seen a number of ERMI samples where the client shows us what they think is a high ERMI, but upon further analysis, looking at the individual mold species in their physiology, comparing that to what we would expect to find in their home if they had no water damage, that ERMI score doesn't accurately portray an exposure. Actually, their home looks relatively good. So these two samples, mold plates, and ERMI, I think, again, are great tools. If you have the money, I'd love for somebody to do Petri dish samples and an ERMI to give you a better picture of not just presence, but current activity and go from there.

Dr. Christensen: Well, that's usually what I have my clients do is I'll say, hey, I want you to get ten mold plates. And, by the way, we have a very quality lab that does the mold plates as one of the sponsors for this summit because you can't just go to Lowe's or Home Depot because you really want to have the right agar, that's the gel for these things to grow on if you're looking for the right species, but I like to send people home with both

mold plates, as well as an ERMI sample. And so, the mold plates go into the different rooms and different bedrooms, maybe in the laundry room. And one may be in the middle of the kitchen so you can see, yeah, like you said, how many things are growing, and there's no houses that's mold-free. That's important to know.

And then the sampling, the dust sample, it lets you know again, do you have also some of the bad species, the bad guys, like Stachybotrys or Chaetomium, which actually are hard to find on those mold plates because they're very heavy species. My understanding is they're on the ground so that you're not like waiting to find them in the plates, and they don't stay up in the air very long. So those two things can be useful or helpful to help point somebody to the direction, yeah, you've got a problem.

Mike: And I think if the patient, client understands that this is really just a cursory screen of the home, and they don't think that they're going to—— They don't come into that with the expectation that they're going to answer everything with those samples, it ends up being a great tool for many of the clinicians out there who again, are working in very challenging situations where they're trying to get some evidence numerically to justify diagnosis and treatment. I think it's always been a fine balance of saying, okay, that's enough now. We need to go into additional further inspection with a professional.

Dr. Christensen: Absolutely. Well, I had a fascinating conversation with Dr. Donald Dennis. He's an ENT in Atlanta who works with all these really sick sinus clients. And he actually uses those, the agar plates to tap the clothing of the people when they're coming in and using a nasal swab. And to put on that agar plates to see what grows really off their bodies, not just in the environment. Well, great. Let's go ahead. And I want you talk about again, what does an—— Actually, before we get to what an indoor air quality professional should look at in your house, just tell people what should they be paying attention to, windows, rooflines, all that kind of stuff, both outdoors and indoors?

Mike: Sure. I think again if we go back to the model of whether it's a home inspector who's got the eyes, the knowledge, the experience, or the homeowner, he certainly has your common places to look for. Whether it's underneath the kitchen sink or vanity plumbing sources like water heaters, HVAC systems that have evaporator coils. For those of you who have cooling in the summer, you'll have one of those. Nears tubs and showers and toilets, do you see evidence of water damage? These would be more of the obvious places to look and places you should look to see whether or not there's evidence of damage, which then could lead to, hey, do I have a hidden microbial source? Or you might even be able to see it at that point. The less common areas are a bit more challenging, and it goes right back into the issue of where do you draw the line between an initial assessment kind of a do it yourself to kind of get a better feel for your home versus saying, all right, we need to bring in the professionals.

But a few examples of that are take, for example, ethos or exterior insulation finished surfaces. Some people know it as synthetic stucco or drive it. That is a wall system around the exterior of the home that in certain areas and installed certain ways has been a problem where there's been hidden microbial growth in the wall system that the homeowners couldn't detect. In fact, it's been even challenging for IEPs to detect because it doesn't present itself so obvious. There's not a water stain. There's not water damage or mold growth growing, but yet there's your client, and there's your patient getting sick. So the exterior wall system can be to look at it depending on what the system is made up of, what the walls are made up of—wallpaper on exterior walls or even in places of high humidity: kitchen, laundry room, bathrooms, and notoriously you pill the wallpaper back and eventually find microbial growth because it's not usually a permeable material.

It's the perfect environment for mold to grow or bacteria.

I mentioned earlier the HVAC system where you could have a condensate leak, but it doesn't mean that's always obvious where there could be growth. In a more tropical or humid climate, where there are HVAC systems, you might find that there's mold or bacteria growing in, on, or around the evaporative coil or nearby ductwork. Well, that's not always an easy thing to access. It may be your unit, your furnace, or coil is located in a hard reach area, or there's tape, or it's screwed into where it's not easy. But that could be one of those hidden sources that is important for people to consider.

Swamp coolers, for those of you that live in drier, warmer climates, those are very popular because it's based off of evaporation. They basically pump moisture into your home, which is cheap cooling but also can present a host of issues. Every year I get a number of phone calls in the summertime people saying, hey, I got mold growing on my computer seat. And the first thing I ask them is if they have a swamp cooler. Usually, the answer is yes. So keeping that in mind. And then, of course, roofs. Roofs are the bane of my existence, especially flat roofs. Flat roofs by design are supposed to be sealed, but notoriously there's gaps, and there's cracks. And so, those are challenging areas to look at because can you really jump on the roof and see a crack that's two inches wide?

Well, that's not the kind of crack you're usually going to have. It might be microscopic or so small that you can't see it. And then finally, the other two big, huge ones that we normally have issues with are crawlspaces. Crawlspaces I've yet knock on wood to—— I guess I should not knock on the wood, but I've yet to find one that hasn't been a problem to some degree. It's usually because it's that perfect Petri dish type environment that it's dark, it's moist. There's not a lot of air movement. It's a perfect environment for growth. That becomes an area that you want to take a close look at.

And then finally basements, where we see basements beyond the obvious water intrusion, like an old home with a basement that they didn't really protect the walls on the outside are things where we see moisture barriers being improperly installed. And we've seen this before, where you can't see the evidence on the living side of the basement, but upon further investigation, they open up, remove the drywall, and there is a moisture barrier right up against the drywall. And there is a ton of mold or bacteria growing that wasn't obvious to the occupant, but it was only my understanding of the building construction that they were able to end up finding it.

Dr. Christensen: Wow. Yeah. Again, for homeowners, there's a lot of good resources in my eBook. I have a lot of resources, different websites of different quality, mold inspectors that can take you through what are the areas in the house that you want to think about, but you really hit the big ones. Again, flat roofs are a problem, but also roofs that have lots of peaks and valleys. And it can have flashing issues also around things like the windows, the skylights, and also again, exteriorly when you to look at your windows, and you want to look at stucco again like you said, it's a big problem. Drainage around the house and away from the house. And those are all things to talk about. I live in a house that has a crawlspace and the house where I got really super sick in a very nice, very big, expensive neighborhood it was the crawlspace that was full of stuff.

And we had air conditioning ducts running in the crawlspace that was sucking all this stuff and blowing it around the house. And nothing obvious. And basements and improper installation. And like you said, wallpapers. I remember I was at a motel one night, and I just could not sleep. I felt gas. I felt awful. And we'd gotten there late, kind of late at night. And when I went in the bathroom the next morning, I could

see that the wallpaper was peeling off the wall and there was all this black behind it. And I'm like, I'm out of here. And I didn't pay for my stay. So, yeah. So those are really good tips for folks to use. So why don't we just start with what the overall big picture is that anybody is going to want to do when assessing a house, and then we'll get into the DIY?

Mike: Absolutely. So just like anything else, just like clinicians do, usually there's a client interview or intake of information. And as you can see on the screen, you're looking for history, past water leaks, past intrusions, remodel efforts that might've affected plumbing or other issues, and certainly client areas of concern. So this kind of happens technically before you step in the home. You could do it different ways, but that's what I do normally. Once you have that information, you're always open-minded, but you're starting to formulate a hypothesis. It sounds like a science experiment. And it kind of is because you're walking into the home, and you're saying, okay, I know they have these concerns. I'm going to be looking around for other things, but I definitely need to focus on these ideas and see if any other ancillary things make sense. When they're doing the visual assessment, again, it's kind of like what you see.

You're looking for evidence of water stains, water damage, growth. Are there suspect odors? Even the occupant activities in the home. They're tracking in mud everywhere, and it's getting in the wood and the carpeting and the flooring, and that could be a potential source. You're paying attention to what's going, what's being tracked in, or what's otherwise showing that there might be more of a microbial source beyond that evidence. And then while people are doing that assessment, it's not uncommon for a home inspector to also have real-time machines. And so, when we talk about that, I want you to think about TVOC meters or Total Volatile Organic Compound meters, particulate counters. Those sorts of devices that inspectors will use to help guide them. Maybe there's a problem——

Dr. Christensen: And we have a great slide on that, that you're going to go to into detail.

Mike: Absolutely. And the takeaway is that you can use these tools to kind of help locate a problem that might not show itself visually. I think finally when you get done doing all that, what I do with my clients is I sit back down with them. We review the history. We review the visual findings or real-time measurements. And then, we begin to discuss what questions still remain. And, obviously, where there are areas that are obvious, maybe there was a significant leak or flood where sampling might not be needed, fine. You don't need sampling, but there might be a number of other areas that are suspect in that now you need numerical evidence where you want it. And that's when you talk with the inspector and the inspector talks with you about the different options for sampling.

Dr. Christensen: Okay. Well, great. Let's talk about again quality assessment. If you're having a professional, what are the tools that they should be bringing? Yeah.

Mike: Absolutely. I want to show that picture or the slide you're talking about real quick. I was talking to everyone about that basement and that plastic. There's an example of what I mean on the upper corner. They had to open up this wall in order to find the problem, but it was otherwise hidden. And you're right about the window flashing. I mean, wind-driven rain, there's all sorts of things that don't present itself visually. And where does the homeowner draw the line in cursory observation before they hire a professional? Because most people don't just want to randomly tear, open their house on speculation alone. In terms of tools and things of that nature——

Dr. Christensen: Well, wait a minute. You have some great pictures. Let's see that.

Mike: I'll go back. Let's enjoy them.

Dr. Christensen: Yeah. And the HVAC again. Show this HVAC picture here.

Mike: Yeah. Okay. So we talk about microbial growth in ductwork, and there's two ways, of course, that can happen when you inject moisture-laden air, or if there's otherwise a condensing issue where moisture is accumulating in the ductwork. It's not if you're going to have microbial growth. It's more of a matter of when and how much and that sort of thing. So that picture that you see on the lower right there is an example of ductwork of a picture taken on the East Coast. It was kind of a chronic problem of continued moisture. There was a nearby fresh air inlet. Ductwork that was connected intentionally from the outside to bring in fresh air, but they weren't conditioning that humid outdoor air. So in their ductwork, they had hot, warm moisture-laden air mixing with cool drier air. And the result was long-term buildup of moisture, and that picture kind of tells the story.

Dr. Christensen: And how did you find this? I mean, did use a camera to get in there.

Mike: There are various tools and borescopes, and that sort of thing are usually helpful. But in this particular case, it actually wasn't me. It was another colleague of mine who is so used to this being a chronic problem. They walked into the home and one of the first places they actually looked at was inside of the ductwork because it was just an odds thing. It's kind of like if you have a crawlspace in the home versus a house that doesn't. If it has a crawlspace, you're going to be looking at it. It's one of those low hanging fruits, but in Arizona, the truth of the matter is you might not find this because we're not dealing with the same moisture issues you guys are.

Dr. Christensen: Right, got it. Well, great. And then I have Mike McNatt, who's going to be talking about again, air quality. And then again, kind of what do you do for something like this and what are some of the options, and do you rip out a whole system? Do you rip out all the ductwork? What are some of the options that you can do? What about fogging with H2O2 and some other things to help clean this up because that's a big problem. Wow. Fresh air is supposed to be good, and then it's creating that problem.

Mike: Everything can be done in a good way or in a bad way.

Dr. Christensen: And another big issue is air conditioners that are too big for a house. And so, they're cycling very frequently and letting the humidity level get pretty high. Yeah. All right, fire away.

Mike: Yeah, no, sure. This is good. So you'll have to forgive me. I'm borrowing from some slides from last year's conference, but there's good stuff here. We talk about tools and techniques. What you see in front of you right now are certainly basic tools, obviously, flashlight, infrared camera, moisture meter. All these things make sense. I got to be honest with you. A pair of eyeballs and a flashlight have gotten me 90% of things in terms of an assessment because you're looking for things that are not so obvious, and it just takes years of experience, I think, to get it. No one's perfect. I include myself. Particle counters, manometers that test for pressure differentials. We're looking for pathways. Oh, my husband doesn't think that there is something coming from the crawlspace.

Is there a way that we can show a pressure differential between crawlspace and living space to show that yes, in fact, air is moving from the crawlspace into the living space? There's a tool that you can use for that. An inspector may or may not show up with something like a combustible gas detector or a hydrogen sulfide meter. I mean, if there's a gas or odor complaint, they may very well, but that total volatile organic compound meter, TVOC meter, some companies will bring that out if there's even any suspicions of chemical exposure concerns or even microbial where it's more of a VOC concern.

These devices allow inspectors to kind of look at a full spectrum. It's not going to tell you a specific contaminant or a specific name, but it'll give you a range. And just like a particle counter, just like a Petri dish, just like multiple samples taken through a home, you can look for trends. Wow. Every single time I go back into the master bedroom, the VOC meter kicks up a thousand times higher, to use a convenient example, than the living room, and that might prompt the investigator to say, we need to look at the—— We need to be more intrusive, or we need to spend more time in the master bedroom. These are a few of the basic tools that you might have them run into.

Dr. Christensen: Okay. And I just wanted to come back to something that you said. You were talking about pressure differentials, and this is also a big concept because we were talking about again if you have a crawlspace or even basements that if you are creating negative pressure inside of your house when you turn on your bathroom fans or your kitchen fan or even your air conditioner comes o, and it's pulling, it's sucking the air in, you can create negative air pressure. And that's what can pull again particles and fumes and VOCs and whatever up from the basement or even just through the flooring and or through the walls as well. And this is where positive pressure ventilation also is helpful. I'm saying this, like, I know what I'm talking about.

Mike: You're doing a hell of a job, I admit.

Dr. Christensen: It's amazing how much of HVAC I've learned in all of this and learned about HVAC systems because this is such a common and hidden place where things are going on that you don't see. So great. So these are some of the tools that again, a quality inspector should be having: at least a temperature and humidity meter, a particle counter, a moisture meter, and infrared camera, and a flashlight. And then if you're doing more chemical inspections, then that's what some of these ones on the bottom are for. Is that correct?

Mike: Absolutely. And in general, it definitely boils down. But yeah, I think you've nailed that on the head. The one thing I want to just add to your comment, and I think you made great observations, is it is understanding building science. Beyond understanding the construction of the home, it's understanding pathways. And I think that's what an inspector needs to know a lot about. I was lucky because, at 16, I was learning about airflow patterns. I had no thought that I was going to be an IEP at that time, but I was working for an air conditioning company. It's so critical that you understand pathways and driving forces.

You could have duct leakage to do just what Margaret was saying about creating pressure differentials, which is it pushes air or pulls air. Even a strong wind can cause differentials. Your house isn't a bubble. In fact, if it was a bubble, and it was sealed every time you shut the door, your ears would pop. So you have pathways. A lot of times, they're microscopic, hard to see, but when you add them all up, your house is very much communicating with the indoor-outdoor environment. And that's why it's important for the inspector to figure out where are those pathways, where are those driving forces so they can help prioritize, even locate, contaminants in the home, and how to address them.

Dr. Christensen: And when you're talking about pathways, you're actually talking about pathways of air movement throughout the house.

Mike: Well, when we say pathways, just to be clear, it is a hole. It's a crack. It could be a large hallway. That's a pathway. It might be microscopic, or it might be something you can walkthrough. A driving force is what either pushes or pulls a contaminant one way or the other into the home. And when we normally talk about driving forces, it's a lot of what you said. It's air conditioning systems is the number one driving force of contaminants. It's directly designed to do that, not the contaminant part, but the air movement part.

There's leakage of the ductwork. And then there's also the again, there's environmental conditions, heat differentials—it's hot outside, it's cold inside. You're going to have air that wants to migrate towards the inside of the home. It's critical. And I think that's why we're hitting on this point for the IEP to understand these things. Because without that, they may dismiss an exposure that you, the listener, and your doctor is screaming from the mountain tops I think I'm having an exposure from this area.

Dr. Christensen: Right. That's so important. All right, well, show us what else you got here. This is great.

Mike: You asked earlier offline about just more advanced types of sampling. And I wanted to just give a couple of quick examples. You can kind of help tell me if how far you want me to go, but there's a big difference between identifying a microbial source, identifying a source location, and or identifying exposure. And so, obviously, this is not meant to be exhaustive. I just wanted to give you some popular examples, but when somebody takes a tape lift or a swab of an area that they think is microbial in nature, they're not really directly addressing exposure or telling you your house does not reflect normal fungal ecology, or this is what you're breathing. They're saying, I think this is a growth, and I want to identify it. That's typically the limitation of that type of sample. When somebody is trying to identify a source, meaning I think there's a mold source, as an example, in a wall cavity in my master bedroom.

There are a few different ways to confirm that or validate or get evidence of. One is a wall cavity sample, the picture on the bottom here where my cursor's at is an example of actually me taking a cavity sample from underneath the kitchen sink cabinet. But you can apply that to that wall of concern. Maybe it was the window flashing that you mentioned earlier, Margaret, that you suspect was leaking. And you wonder if there's mold inside of that wall because you're trying to justify having the need to remediate that area. The other methods that they have as a newer technology—— Well, it's been around for a while. It's just not widely used as much is called mycometer. And it's not a plug. I just want to say the technology is it looks for fungal enzymes. It's a less intrusive method of sampling near that same wall. You're not drilling into the wall. You're just sampling near it to see if there's evidence of fungal enzymes coming from that wall.

Beyond that, you have the tools that you kind of already mentioned earlier, borescope, or cameras. In certain cases, you might even open up the wall. The challenges with the latter two is that with opening up a wall, there's certainly the exposure and cross-contamination concerns. So it's about doing it under containment and all these other issues you run into, lead, asbestos concerns. When you do a borescope, the problem with that is—— First of all, I'm sure there are really good borescopes out there, but the version I have, it feels like I'm looking through a straw. And so, it's very limited in terms of its field of view. The other thing is that mold doesn't always present itself like a perfect picture. Certainly, there is a lot of mold that has that classic black or gray, brownish, greenish color, but a lot of mold can blend into the natural building materials that it has been growing on.

And you may not be able to detect that. So my concern to your audience would be that they understand the limitations of a borescope. Maybe it's like, well, let's start with the borescope. Let's see if we see anything. And if we do, then that kind of answers that question. But if we don't, then you have options to pursue it further. It's like, well, do we want to spend the money to do a cavity sample? Or are we at that point where we want to remediate? Or should we stop? Because this wall doesn't have a lot of history and let's focus our attention elsewhere on other bigger areas like the crawlspace. So that's an example of source location.

Dr. Christensen: Got it. Okay.

Mike: And then, of course, finally is we have already briefly touched this in the Do It Yourself version, but when we're looking to address exposure in the home, and that's kind of a loaded statement, so I'm trying to keep it simple. We are, as an IEP, trying to determine whether or not the home reflects normal fungal ecology, not mold-free, but it's reflective of your outdoor environment. That would be normal fungal ecology. There are different tools to use. Most people understand air sampling, and I'll let you flush out the questions on those later, but there's different types of air samples people can collect. It gives you an idea of what's air bowing at that time that they sampled. And what a lot of people are learning more about are dust samples.

We touched on that with the ERMI dust samples. It's not as popular. It's growing in terms of its understanding. People that are doing more DYI, they're not as familiar with it. There are fewer IEPs, in my opinion, that really understand how to use ERMI samples or QPCR analysis because we're technically not taking a dust sample off the floor as that picture on the lower right would indicate by that template you see. A lot of folks are taking dust off of elevated surfaces like the top of that piano in the picture right next to it, or off of the classic tops of the picture frames. But these are different methods is the takeaway that people can use, that people have a lot of knowledge and experience with to determine whether or not there appears to be a source in the home or whether or not things have been resolved and now your house reflects normal fungal ecology.

Dr. Christensen: Okay. And then let me just make one comment, too. One of the things that I've learned in all of this is that, for example, these pictures over here on the left, it's obvious you can see something is growing through, and you're actually just identifying what it is. That's what you're saying. And my understanding is that when you can see something visibly, it's like the tip of the iceberg that behind that, you can have ten times as much in the materials growing as you're actually seeing visibly. And one of the reasons you don't want to spray it with bleach or whatever is you're just going to bleach it, but you're actually not getting rid of it. And you can actually provide more moisture for it to actually get worse and grow because you get ten times more than you're seeing.

So that's just identifying whatever it is. The source location you talked about, this was using things like a borescope. So you're actually poking a little hole into a wall and getting a sample of some sort and something that you can actually—— A scope you can actually visualize, but they can be very limited in view. I think about doing laparoscopy, but with a laparoscope looking in somebody's belly, we can move it around a lot easier than you can do it inside a wall. You need a camera that bends. So that is another way, but you can actually take some samples from indoor walls, but again, that becomes more expensive. And you want to think about a good history over that. And then, the most common types of sampling that is done traditionally by standard inspectors is air sampling. And I'll take an air sample from outside and an air sample from maybe various rooms inside the house. And then the dust sampling. We can also talk a little about mycotoxin testing now that you can also do with dust samples. Do you want to comment on that a little bit? That's a very new technology.

Mike: Yeah, sure. Listen, it's challenging. I used to collect mycotoxin samples. I used to back before Dr. Jack Thrasher passed away. I had been working with him and Dr. Hooper from RealTime Labs on taking dust and actually air samples. We were doing high volume to try and get an idea. Here's what I can say about mycotoxins. I think what makes a good IEP is that they're always a student. We're always learning. The problem is entry to the market. We talk about costs, and what is the value? What are you getting for the sample? And here's the concern I have. I understand that

from a clinical standpoint, doctors are using, some, are using urine analysis, whether they're using that lab or another to determine or get an indication that there might be exposure. However, despite the arguments that can be made about diet and is it stored, is it recent, does it show recent?

Assuming that there is an exposure, the problem is it's not as easy to do mycotoxins sampling in the home. I don't mean by virtue of the opportunity to actually collect one. I know it's available. The challenge is, what's normal for that home? Just because you find mycotoxins in the home, does that mean it's coming from in the home or outside of the home? So if we're being completely transparent here, as an IEP, and that's important because it might be a different focus for clinicians, as an IEP, I currently have very little use of a mycotoxin sample in the field. Don't get me wrong. If my boss or the clinician says, collect one. Guess what we're going to be doing? But the takeaway here is I can't honestly look you in the face and say, yeah, we found I positive count of a Gliotoxin or ochratoxin A, and that must mean you have an indoor source because here's my fear.

Do I really want to send my client on a ghost hunt, looking for a myco—— Using the mycotoxin sample as the metric when in the end, if we somehow had a crystal ball, if we could somehow go back in time and look at this, we found out that those levels were just normal for the home, and it's normal background. We go back to what I said earlier: all molds, mycotoxins at one point in their life cycle originate outside. If it grew in your home, like underneath the kitchen sink cabinet, fine. There's no argument, but what I'm trying to get the audience to understand is that you really need to ask the inspector that if you're going to do a mycotoxin sample of the dust, fine, but how do they separate what's coming from outside versus inside? And what you might find is that they can do control samples outside to give you a positive solution of doing that. But then you start to wonder how much money are you asking the client to spend? And is there another technology they can use to determine whether exposure is going on without doing the mycotoxin analysis?

Dr. Christensen: Okay, well, that's good. And the folks I know in my area who use the mycotoxin testing, they're taking it from the air conditioners. They're not just doing random surface sampling. They're actually doing it in the HVAC system.

Mike: Right. And it's still a question of, did it come from the outside or did it come from an inside source?

Dr. Christensen: And that's a good question. And I have Dr. Matt Pratt-Hyatt speaking, who has developed or been involved in and dealt with a lot of mycotoxin testing, kind of talking about all the different, various sources of testing, and so we'll go on there. All right. What else do you got for us? Okay, so the big thing here is that again, an environmental assessor is probably—— I mean, they're always going to do air sampling. They may do it. Again, if you have some obvious sources, they may do some identifying with swabbing or tape lifting, and then plus or minus looking inside cavities. So what else do you got?

Mike: Well, I think when it comes to an assessor, again, a part of what makes an assessor good is the ability to educate and weigh the results. It's not just about sampling, of course. I mean, even the history if someone says I had outdoor water flood into my home, you're already going to, in a lot of cases, on industry standards, you're going to remediate that wall where sampling wasn't even taken. So it's a good IEP who can listen to the history and say, okay, this is under this type of a leak, like a category three black water leak. We don't even need a sample unless, of course, you want the documentation, but then it's also about interpreting the results. And I think that a good inspector is going to be able to weight the pros and cons of each like, yes, this result came back bad, but keep in mind that this is how we sampled it.

And this is what it can tell us. Here's what it can't tell us. The sample came back negative, which is good news, but please understand that it doesn't detect mold fragments. So you could have an exposure. It's not about disqualifying everything. It's about being honest with the person who's paying the bill and saying, here's what this data indicates. And it's either supporting that there is a source or there's not. And then, of course, coming up with a game plan. Finally, it's reports with recommendations. One of the biggest complaints I hear other than what I just shared with you from hundreds of clients I work with is that an IEP will do sampling for you. You'll spend the money for it. And then when they hand them a report, it's kind of more of a finding's thing. We found this. We found that but there's very little interpretation, and there's even less recommendations. I feel like that's kind of like showing up with a clinician and the clinician saying, well, I think you have Lyme and then walking out of the room.

Dr. Christensen: Okay. So now what we've talked about it has been that these are the things that you want to think about as a homeowner, looking around your house for obvious sources, maybe some not obvious sources, some do it yourself kind of sampling that you may want to consider such as mold plates or getting the ERMI PCR testing, looking at the dust to figure out, should I have somebody come in here? And if you're super sick, I just tell people, get somebody to come look at your space. And then we talked about some of the tools that a good inspector needs to be bringing with them, what they're going to be thinking about, what they're going to be asking about the history of the home itself. And then the inspection itself and the findings, whatever that they're picking up. And then you get a report, and now what do you do?

Mike: Right. So with the report, obviously, what you're hoping for is recommendations that help either address or remediate the source or conclude that there's not enough evidence to support further action. So in simplistic and an example, if someone gives you a report and it has recommendations, typically, the next step is hiring a company to execute them. And if it's in the case of a mold remediation project, you're reaching out to third-party companies to get bids, to tell you what they think it would cost to do that work. In the simplest forms, that would be the next step.

Dr. Christensen: Yeah. And one of the things that you commented about earlier is that a lot of times, with some mold inspector people, they'll say, well, this is what we found, but they're not giving what the recommendations are.

Mike: Right. Yeah. Sorry, not to interrupt. I think that the takeaway on that quick is just the audience here just know that when you hire an IEP, we go back to what's in a good IEP? What are your expectations? You need to have an IEP that's not just going to give you a report with their findings. We found mold here. We didn't find mold there, but their interpretation of what it means and of course, a report with recommendations because if not, you'll end up being frustrated with a report that you don't understand that you spend a lot of money on, and then you start questioning why maybe you should have done a little bit more Do It Yourself samples to start with for that price. So it's really important that the inspector is going to help you from start to finish. And that includes that report with recommendations.

Dr. Christensen: Yeah. So I would definitely recommend that, especially if you're really sick. Again, you want to work with some quality folks. So let's talk about a little bit of the challenge of getting quality inspectors and what you're doing with ISEAI to help educate where the science is right now because kind of the standard inspections and how you all were trained is maybe 30, 50 years behind what we know from the science and just some things that you were telling me earlier before we started recording. I want you to comment on that a little bit.

Mike: Absolutely. As a brief intro into what work ISEAI is doing, what I can tell you is you're right. A

lot of the basic platforms of certification for folks like myself, cover fundamentals, which are key, the differences is that we're talking about a higher level of thinking, dealing with lower exposure concentrations that traditional mold inspectors, the old dogma of thinking would normally just pass off, dismiss as not an issue, which can be very frustrating for multiple reasons.

The problem is that currently, there's not a college if you will, that offers a course for IEPs who have a thorough understanding of chronic illness and exposure concerns. So in transitioning to what we are doing out there in the industry, there are other organizations that are doing great work, but a big one is ISEAI, which we talked about earlier, International Society of Environmentally Acquired Illness. A couple of quick things. First of all, quick and easy. If you're looking for education and what to look for in an IEP, there's a convenient document called Finding the right IEP to assess your home if you go to Iseai.org.

Dr. Christensen: Which is I-S-E-A-I.org.

Mike: That's right. Thank you. And go to the get help page, click on it. You'll find that document. It kind of gives you more of a cleaned-up version of what we've been talking about, but other things that ISEAI is doing, first of all, they have an educational tab which has a wealth of audio and video information—free resources that you don't have to be a member of ISEAI to acquire. And again, you have some of the best-known leaders in the field. There's many of them talking and interviewing and talk about topics anywhere from certainly chronic illness exposure to the environment. There's also modules. I want to give a shout out to Caleb Rudd in Australia, who's helping with ISEAI develop modules, I should say, both for clinicians and IEPs to take that are attempting to tie together that relationship between the health of the body and understanding it and health of the home.

Because there's a lot of synergies, and that's the whole point is being able to work together and saying, well, how far do we go? How much do we need to clean? Are they still having an exposure? And honestly, it's going to be huge because I don't know of any other organization that's putting together this educational program. That's something that's going to be debuted in the future. I don't have exact dates for you, but there's something there. And then finally becoming a member. Honestly, again, it's not a plug, but if you become a full member of ISEAI, you have access to LISTSERV and forums where some of the most brilliant minds——

Some of you, which are listening right now, have the ability to have real-time conversations. So to that IEP, that's out there listening, you have a tough question. You're not sure about maybe a testing approach, or maybe you want to ask a medical question, but you're not sure how to ask it. You have not only access to that, but the environment that ISEAI has created is one that is open and respectable so that you don't have to worry about judgment. You don't have to worry about asking what you might say is a dumb question. There are no dumb questions. We are learning, and there is a sharp learning curve when it comes to chronic illness and exposure. ISEAI gives you that ability to tap into some of the brightest minds just by becoming a full member.

Dr. Christensen: Well, that's great. It's so important. I think what's unique about this organization again, is that we're bringing together leaders in the field of indoor air quality and environmental resources, everything from understanding electromagnetic fields, as well as air quality, as well as mold and also building materials and VOCs and really also starting to work with—— Hopefully, we'll have a lot more of the building biologists join this group.

So we have, again, the doctors of the homes and buildings and commercial buildings, et cetera working with the clinicians and like myself who are in this field, dealing with chronically ill and sick people that we know really, all the chronic

illness that we're seeing is environmental and environmental related. And I've just learned that like 70% of all illnesses, air quality is a huge component of that. So as we bring together the kind of great minds on both sides and allow us open dialogue and allow us to learn, it's just really amazing. So anyway, thank you so much, Mike. Tell us a little bit more about how we can get to your website and then your radio program.

Mike: Sure, absolutely. As it relates to the radio program, it's IEP, the letters I-E-Pradio.com. If you go there, you'll find a bunch of free, not just videocast podcast; we're on pretty much every social media platform, iTunes, Sound Cloud, all of that. You'll find a lot of educational material that get into very big topics, anything from post-remediation to remediation and techniques to interviews about things to consider when renting or buying a home. We just got done doing an interview about duct cleaning, HVAC cleaning, which will come out probably in less than 24 hours. And we also talk about other important things like contents cleaning and the studies. And that's the whole point is it's a platform for you to go learn and hear it from the horse's mouth, hear from the people that are making the claims. There's also a page for references.

A lot of people are saying, well, you're saying all this information, but where's the evidence? Where are the studies? Go to the references page. You'll find it. On environmentalanalytics.net, that's my company name; you can learn more about me. It's tricky. I don't ever like to promote myself. However, if maybe you're in a situation where you're looking for a second opinion, if you've had sample data collected, but what you're faced with is a challenging financial or logistical or whatever situation, we do offer not just boots on the ground, but more importantly, virtual consultations. And we would never want to replace boots on the ground assessment with a virtual or a phone consultation, but there's a lot of folks out there that just need to have another resource they can trust. That's one way you can get a hold of us. We'd be happy to kind of look at your information and see what we can do to guide you

Dr. Christensen: Well, that's great. Yeah. Doing the remote consultations can be very useful, and you have whole questionnaires and everything that you send out ahead of time and ways that you really get to help your clients assess from far away. And hopefully, I like that all the folks out there watching this, that they show this particular interview to their indoor air quality person that they want to work on their home because I think we are all working on educating one another.

So thank you so much, Mike Schrantz, from Environmental Analytics and IEPradio.com, and one of the amazing founders of ISEAI.org, International Society for Environmentally Acquired Illness, which I'm so glad to be a part of, and to have so many different colleagues to vibe out with on all of this stuff and learn from one another. So we'll look forward to whatever additional information that you have. Thanks.

Mike: Thank you very much, Dr. Christensen.

Immediate Relief for Anxiety

Trudy Scott, CN

Dr. Christensen: Hello. This is Dr. Margaret Christensen, host of the *Toxic Mold Summit*. And I am delighted today to have food and mood expert, Trudy Scott, who as my guest today, she helps to educate anxious individuals about nutritional solutions for anxiety. She's known for her expertise on the use of targeted individual amino acids, and that really offers hope for immediate relief from anxiety. We're going to get into that. And how also she's really very knowledgeable in the whole area of pyroluria. We will touch on that, which is a special form of social anxiety, as well as the harmful effects of benzodiazepines.

She's the author of The *Antianxiety Food Solution: How the Foods You Eat Can Help You Calm Your Anxious Mind, Improve Your Mood, and End Cravings*. And she's been the host of the *Anxiety Summit* now, six different summits over the past number of years, which has been an amazing online educational platform for both consumers and health professionals and has been dubbed a bouquet of hope, which I love because I'm all about hope. And that's one of the things that I've tried to bring forward in each interview.

And she helps to educate health professionals again, via the Anxiety Nutrition Institute, and she's sharing a current research and practical how-to steps. So that's great. Trudy's just totally passionate. I've heard her speak before about sharing the powerful food mood connection because she's experienced the results firsthand and finding complete resolution of her anxiety and panic attacks. So, welcome, Trudy. Thank you so much for joining us today.

Trudy: Thank you, Dr. Christensen. And yes, I'm all about hope as well. And I'm thrilled to be here on your summit. I had the opportunity of tuning into the last one, learned a lot from you, and the experts and my community absolutely loved it. So I'm really thrilled to be here talking about the anxiety aspect. I will say that I'm not a mold expert, but I do work with a lot of people who have anxiety. And then I have them work with someone who has mold expertise. So I'm bringing the anxiety aspect to this summit, and I'm really pleased to be here and to be sharing.

Dr. Christensen: Well, that's so great. And I'm just excited because, again, this new summit has updated many of the talks that I did the last time, as well as I have about ten new folks, including yourself, and so I'm really excited to bring you here because anxiety is a very common presentation in toxic mold. So first, why don't you give us a quick overview of how you use amino acids for anxiety, and how you actually got into doing this work?

Trudy: Yeah, so I got into doing this work because of my own anxiety. I was working in corporate America under a lot of stress, and started to get increasingly anxious and developed social anxiety, had panic attacks. I remember that first panic attack. I had no idea what it was. I had no idea where it was coming from, and it was very

unusual because I'm an outdoorsy person. I'm a world traveler. I have backpacked through Europe for a number of years. I met my husband on a cliff face, and we rock climbed, and I always climbed and spent the night on a portaledge in Zion National Park. I was an adventurous person. I wouldn't have called myself timid or anxious, and I had no trauma in my life, but it was my biochemistry.

And I had this, what I call this perfect storm of factors that changed my biochemistry that caused the anxiety. I had gluten issues and leaky gut and adrenal issues and low progesterone and heavy metals. You name it. Fortunately, one of the things that has not ever affected me is mold. So I'm really appreciative of that, but I had all of these factors that were changing my biochemistry and causing low serotonin and low GABA and causing this anxiety. Long story short, I figured out this working with various naturopaths and various practitioners, put all the puzzle pieces together, used some of the amino acids that we're going to talk about today. GABA was one of my lifesavers and eliminated the anxiety.

I went back to school to become a nutritionist so I could share this information because I see more and more people with anxiety, and it seems to be an issue in their late thirties, early forties. That was when it hit me when my hormones were starting to change. And because of the work that I—— Because what I experienced and using the amino acids, I took a deep dive into this area because they are so amazing in terms of giving quick relief, quick, effective relief, and it allows you to address the underlying conditions. And, of course, if mold toxicity is one of those underlying conditions, as you know, it takes a long time to remediate, to recover, to heal.

And for some people, it takes a long time for them to even figure out that it is mold toxicity that is one of the root causes of their anxiety, but what the amino acids do and these are individual supplements that are taken as precursors to your brain chemicals or your neurotransmitters, like serotonin, like GABA, like the endorphins, those give you relief from your mood issues that also help you make those diet changes because it stops the cravings and the addictions that are driven by low levels of neurotransmitters. And it just gives you that hope right away. So you start to feel a little bit better, and it makes it less overwhelming because when you're dealing with something as severe as mold toxicity, it can be terribly overwhelming.

And it can be, for some people, there's a lot of despair because they're losing attics in their home. They may be losing their whole home, their home household. They have to move home, everything. So there's a lot going on emotionally. So there's the emotional aspect of what they're dealing with, but then there's also the fact that the mold is triggering some of these brain chemical imbalances, and some of the other nutritional deficiencies that we see with mold. So it's a great opportunity for people to start to feel better pretty quickly.

Dr. Christensen: Well, you touched on a lot of really important points, and one of them is sort of the perfect storm. So usually when we see these illnesses, it's not just one thing it's. It's multi-factorial. And there have been a number of different exposures or toxins in the standard American food supply, genetic modified foods, lots of antibiotic use, things like EMFs, too. I know that you told me before that you had been working on lots of computers and all that. So it's never one thing. And what you described is sort of that whole toxic bucket, a problem that just filled up and spilled over. And when you just start to empty that little by little, but I love the fact that we can use these amino acids very targeted initially because you're absolutely right. Sometimes this is such an overwhelming issue for folks to even just wrap their head around. They don't even know where to start. So that is just a great. So maybe you can start out talking about the connections

between mold toxicity and anxiety and low mood.

Trudy: Yes. Whenever I do these interviews, I like to go and look at some of the research. And I remember when your first summit came out, I wanted to go and look to see what kind of research there was on mycotoxins and mental health. And the research has been slow coming as you know. I looked at papers as long as maybe five or six years ago and a lot of the papers even denying that it's even an issue. So that in itself is interesting, but we are seeing more and more research. I looked at one paper called the *Effects of Mycotoxins on Neuropsychiatric Symptoms and Immune Processes*. And they talk about—— I'll just quote a few things here. The presence of mold and dampness was associated with the prevalence of depression and emotional distress. So they are recognizing that.

But then they're also, and you'll see this. They're unclear whether it's due to the adverse effect of the mycotoxins itself, or the emotional and the financial stress of what you're dealing with. So there is still this, and I think it's probably both. It is likely both. The other thing in this paper they mentioned about is this loss of sense of control, and that can trigger anxiety and depression, but what I haven't been able to find is a lot of research talking about the actual direct impacts of toxic mold on the various neurotransmitters, and maybe you've come across some of that?

Dr. Christensen: And it maybe not so much directly in terms of neurotransmitter mimic, but we certainly know that the mycotoxins create a massive amount of inflammation, particularly in the olfactory nerve and the sinus feeding right back into the limbic system, inflaming the limbic system. And then you're turning on the hypothalamus, the amygdala, and again, keeping that kind of the limbic system fight or flight going. And then because it's so disruptive to the normal bacterial microbiome in the gut, then that also, again, that's what's kind of creating the disturbances, the hormone disturbances and everything else.

So I think there is a lot more data coming out, and we have Mary Ackerley talking about some of the neuropsychiatric consequences. And I think as this area as we dive into it more, there's just going to be more and more research. And I have a lot of very personal experience on the neuropsychiatric consequences in my family and myself. So that end of six there. That's a good study, but anyway, maybe before we get into the amino acids, we can talk a little bit about benzodiazepines and SSRIs. And yeah.

Trudy: Before we do that, I just wanted to mention Dr. Neil Nathan because I know he is a new speaker on the season, and I had the opportunity to hear him at Integrative Medicine for Mental Health Conference last year, and I am familiar with his wonderful book called *Toxic: Heal Your Body from Mold Toxicity, Lyme Disease, Multiple Chemical Sensitivities, and Chronic Environmental Illness*. And I was blown away by his presentation. So I'm so glad that you are interviewing him, but his talk was called Mold Toxicity as an Unrecognized Cause of Mental Health Issues. And he talked about it directly triggering anxiety, panic attacks, depression, depersonalization, hallucination. So a lot of people will go to the psychiatrist, or they'll go to a psychologist and not even connect that it could be mold that is causing the problems. So I think it's very valuable to hear this from someone who's working with people with mold toxicity all the time.

He also talks about mast cell activation, multiple chemical sensitivities, methylation dysfunction, pyroluria, which you mentioned earlier, and all of these can be made worse by mold. And then all of these play a role in anxiety and depression. And I'm glad you mentioned inflammation and some of the other mechanisms, the gut, and the microbiome because yes, all of those definitely do play a role in anxiety and mental health issues. Something else that he said, which I really appreciated, and I think that we definitely need to

pay attention to is PTSD caused by physicians who are not a way of mold toxicity.

So the person knows that it is mold, and they know that intuitively that this is what's causing him to be sick and they're not heard, and they're not believed. And then because the doctor's saying that it's not the mold, then their families don't believe them. So now they're alone. So I think that is something that we really need to be aware of as we're going forward and hearing people. So I'm sure you've come across that as well.

Dr. Christensen: Absolutely. And we talk with Dr. Leila Doolittle about, again, the PTSD components of this, and we have a talk where we're looking at brain function and NeuroQuant imaging and the limbic system. We had Annie Hopper update her talk. And again, we're talking about the PTSD component and also, again, kind of the immune system dysfunction that happens. And we have a whole actual module trying to teach that for folks if they're interested in taking a deeper dive because how it's impacting neurotransmitters. So there's a lot. And I so appreciate you saying that because I do think that so many of our clients do end up coming to us with PTSD symptoms from going from doctor to doctor to doctor to doctor. And they've been to the best medical school.

They've been to Mayo Clinic. And they're hey, here's your antidepressant. Here's your antianxiety med, or we're going to label you as something, but we don't really know what to do for you. So thank you for saying that. I think that's huge. So again, we're going to talk a little bit about benzodiazepines and SSRIs because, again, that's the prescription that they're getting from their psychiatrist. And if we have a minute at the end, I'll talk about my own personal family history about this whole issue that's ongoing. Yeah.

Trudy: Okay. Yeah, and that's it. They go to the doctor, and they get a diagnosis, and then they're prescribed a benzodiazepine, Navane, SSRI, and commonly prescribed for anxiety, depression, insomnia. And then if these are symptoms that someone has when they've got mycotoxin illness, they will be given this prescription. And I just see it as an added toxic burden. So if we can use the amino acids or some other approaches, we're not adding to the toxic burden that folks are dealing with. And in case anyone's not familiar, benzodiazepines are a class of a drug that are used to treat anxiety, insomnia, pain, or muscle spasms and other conditions. Someone goes into the dentist, they may be prescribed benzodiazepines, and then they may actually start to get anxiety. So widely prescribed, way too commonly prescribed. Xanax, Ativan, Valium are common benzodiazepines, and we know that long-term use leads to tolerance.

That means you need more and more and more. So your dose goes up and up and up. Then you start to develop dependence. And then we have adverse psychological and physical effects that people will describe brain zaps. They may start to develop anxiety when they are prescribed for insomnia. And short-term use is typically—— The ideal is up to two weeks. That's what the ideal use of this is, short term use, but people that are on them for years and years—— I'm working with people who've been on them for 10, 20, 30 years. We've now got research showing that it contributes to dementia. There may be a connection to Alzheimer's. So there are a lot of long-term impacts, and the big challenging aspect is tapering. So someone wants to taper because they are getting these effects.

And the tapering can be very challenging in a small subset of people. There is certainly about 30% of people who have an extreme time challenging, and I've been looking at some of the research and finding those who are on birth control, they've got certain liver polymorphisms, they've been prescribed for quinolone antibiotics. They seem to make the benzos more—— The adverse effects more prominent—anti-fungal medications, alcohol consumption, and opioids. So think of how many people might fit into

this bucket, and then they are also prescribed benzodiazepines. And you talked about the toxic load earlier, and all of these things together. Now add in the mold toxicity, and you can imagine how difficult it is.

So I'm all for using the amino acids if we can, and not adding to this toxic burden. And I talked specifically about benzodiazepines there, but SSRIs, Selective Serotonin Reuptake Inhibitors, are also commonly prescribed. They're not often considered as severe as benzodiazepines in terms of tolerance and dependence and withdrawal, but there is certainly a large number of people that have issues getting off the SSRIs as well. So if we can use something else, then why not?

Dr. Christensen: Well, and there's again, data showing that long-term use of the benzodiazepines, too, is contributing to dementia issues and cognitive decline issues. Yeah. And just to circle back around, you mentioned histamine, and I had kind of meant to talk about that for a second that absolutely I think histamine release is a huge issue behind a lot of psychiatric symptoms, whether it's bipolar anxiety, psychosis as well as things like migraines, and there's a lot of other histamine related issues that what we talk about on a different talk with Dr. Gail Clayton. But I think that's an important thing to address and another way we can work on calming anxiety. So tell us about——

Trudy: You were going to share your family story.

Dr. Christensen: Well. Yeah, so I have four children, and they're all grown adults at this point. My third child is—— Well, he's a grown man, but he had his first episode of psychosis, not otherwise specified when he was nine when we were living in a moldy house and subsequently had a lot of depression issues when he was in his teens. And then multi-factorial reasons, he started having psychosis when he was in his 19, 20. It's been ten years. He's been hospitalized over 20 some odd times. He's got really severe bipolar schizophrenia. He has had traumatic brain injuries along the way. He's got Bartonella as well, and he's got severe mold toxicity, and that's part of what started all of this and probably with some genetics and all that.

And that's the passion behind this summit is I couldn't help him, and I can't help him in a system that's very broken and can't even see beyond these drugs. And so, my passion has gone into educating others and other clinicians and other parents out there to say, hey, wake up and recognize that those ADD meds which he started on, there's something else wrong there. And there are missing nutrients. There's toxins going on. There's infections. There's inflammation. And then boy, you talk about the PTSD and trauma that we've all experienced from the multiple hospitalizations and the homelessness and lots of other things. So anyway, that's my little piece of my story.

Trudy: Well, thank you for sharing, and wow. What a thing to go through, and what a way to turn it around. And I just hope that you get solutions for him because wow, what a thing.

Dr. Christensen: Well, maybe everybody watching can just do some big like prayer circles here. And I realized that I don't have control over this and it's a huge spiritual practice for me, but I so appreciate you, and I've used all these amino acids, and unfortunately, by the time that I learned all of this stuff, he was already well into his adulthood, and I could not change his behavior or his willingness nor any of the psychiatrists or any of the hospitals.

Trudy: Yeah. I hear this from a lot of my clients who've got adult children, and they've just got no control anymore. And it must be very challenging.

Dr. Christensen: So let's see. We were going to talk about low serotonin type of anxiety and insomnia and how you boost serotonin levels because I think that's a huge one.

Trudy: Yes. So with low serotonin, the symptoms that someone would experience is more mental

anxiety, worry in the head, lying awake at night, ruminating, thinking about things, reprocessing, imagining the worst, using carbohydrates to self-medicate, and with low serotonin, it's the afternoon and the evening cravings that we see. Irritability, anger issues, imposter syndrome, worry, panic and phobias, and then, of course, the insomnia as well. So this is typical with low serotonin. I have my clients do the questionnaire. I read their symptoms on a scale of one to 10, and then we'll do a trial of tryptophan or 5HTP and see how they respond. And the trial is done there and then. So they might say, yes, I worry a lot. I'm worried about this discussion I had with someone, and I feel very irritable, maybe an eight or nine out of 10. There and then we'll have them trial the tryptophan, open up the capsule and use it sublingually.

So they get those effects right away and then give me feedback. So within five minutes, they should be able to say, yeah, I'm not thinking about that anymore. Now that you ask, it had gone out of my head, and it has been in my head. I've been playing this over and over in my head and worrying about it for the last three days, but now it's gone. So that's how quickly we get results. That's a clue that yes, we need to address low serotonin, and then I'll have them use tryptophan over the course of the next few weeks in mid-afternoon and evening. The starting dose for tryptophan is 500 milligrams typically. Some people who are very sensitive may need to start lower. The other amino acid for low serotonin is 5HTP. The starting dose for that is 50 milligrams. Some people do better on tryptophan. Some do better on 5HTP.

I tend to start with tryptophan, and if that's not getting the results that we would expect, then we may switch to 5HTP. And we're going to talk about GABA and some of the other neurotransmitter deficiencies. But when I'm working with someone, I'll have them fill in the questionnaire with all the different categories. We've got low serotonin. We've got low GABA. We've got low endorphins. We've got low catecholamines, low blood sugar, and I'll have them tell me which area resonates with you the most. Which area do you want to work on first? And we do one at a time because we want to see if that amino acid is having an effect at that time. If we try everything, we throw GABA and tryptophan and DPA and everything else that we don't really know. So we'll do one at a time, very methodically, have them log their symptoms.

And then over the course of the next few weeks, increase based on their symptoms. So if they are getting results with the starting dose of 500 mid-afternoon and 500 at night, but it's not quite enough, then we will have them increase it and keep increasing until we get no further returns, and then we go back to the previous dose. And I'm going to pause there to see if you've got any questions, but then I wanted to share some research that I found specifically around serotonin and some mold toxicity, but any questions around what I just said?

Dr. Christensen: Oh, yeah. I was just going to just reiterate what you said. So again, so the low serotonin are folks who especially find themselves having trouble falling asleep. They're irritable at night. They have a lot of carb cravings, particularly in the late afternoon. They worry. They ruminate. They just can't calm themselves down and very kind of doom and gloom, worst-case scenario type of symptoms. And then you like to start those folks either on tryptophan 500 milligrams or 5HTP, 50 milligrams. And when you're doing amino acids, you're just using one at a time. Now, I had a question about I tend to just use 5HTP rather than tryptophan because I guess maybe I'm dealing with people with so much gut issues that if you have a lot of clostridial toxins in the gut or bacteria, I know you can turn the tryptophan down the kynurenine—I can't even say that—pathway, which can also create neuroinflammation. So, is that something that you've seen before?

Trudy: No, it's not something. And I'm aware that Dr. Schole from Great Plains is not a fan of tryptophan for that reason. And I've worked with a number of people who have been—— I've been working with them using tryptophan, and then down the road, they say, oh, I did this organic acid test, and my quinolinic acid was high. Should I not be using tryptophan? And we haven't seen a shift. I have looked into the research extensively because I am concerned about the kynurenine pathway and the conversion to quinolinic acid, which is neurotoxic. And what I've seen is that it's definitely more of an issue with inflammation, as you say, but if there's enough vitamin B6 on board, it does not seem to be an issue. But I think with all the amino acids, it's a matter of trying it out. The caution that I have with 5HTP is that it can make some people feel wired, more wired, and there is one study that shows that 5HTP can raise cortisol levels. So that would be a caution with using 5HTP when we might see cortisol high. Now, I have had people with high cortisol and do fine on 5HTP, so I think it is very individualized.

Dr. Christensen: Well, there's so many different factors, again, that are involved in metabolism from genetics, again, to levels of toxic exposure to your detoxification pathway. So yeah, we don't have enough data yet on exactly what to use when, so I like your approach just one at a time and seeing if it makes a difference.

Trudy: Yeah. So the study that I pulled—it was a 2019 study. And earlier on, I'd said I was trying to look for some of the research on toxicity and mold and specific neurotransmitters because I like to understand the mechanisms. And I know there's the gut and there's the other mechanisms that you mentioned—inflammation as well and everything else. But I found this one paper was called The Role of Neurotransmitters Serotonin and Substance P, which is a pain in your transmitter and anorexia induction, Following Oral Exposure to the Trichothecene T-2 Toxin. And I'm not a mold expert. So did I pronounce that correctly?

Dr. Christensen: Yeah. That's right.

Trudy: These are found in cereal grains, and some of them are Fusarium and Stachybotrys, which people may be familiar with, but what they found is elevations of plasma serotonin and substance P, which is the pain marker and this corresponded with the anorexia. So this happened when people were exposed to these types of mold. So this tells me that someone's been exposed to this kind of mold, and they may have high serotonin levels. So you may use tryptophan. Someone may score on the low serotonin questionnaire with all these symptoms, but keep in mind that you can have the same symptoms if your serotonin is too high. And now you're giving someone tryptophan, and they may feel even worse. So that's why I like to do the trial because straight away you can see if someone is—— if it is working for them.

And interestingly enough, I have discovered that for some people, collagen can actually lower serotonin levels. So say some susceptibility that using collagen and gelatin can lower serotonin levels in certain people, and it's because collagen does not contain any tryptophan, and all the SSRIs studies were done with amino acid formulations that did not contain tryptophan, so they could forcibly lower serotonin so they could study the SSRIs. So I don't know if this would work in the situation, but I have had added a blog post on this collagen and how it could lower serotonin. And I had some people comment, a number of people now, saying they suspect they had high serotonin. They used collagen, and it lowered their serotonin, and they felt better. So this is where looking at the actual top of mold, and the mold tests are really valuable.

And then also, in this instance, it may be valuable to do platelets serotonin testing. The plasma serotonin may not be the best test. It is a clue, but the sort of the one that I would find most valuable is platelet serotonin testing. And this case, maybe it's worth doing to see if someone does have high serotonin and then possibly using something like

collagen to lower it. This is all speculation. It's just something that I came across when I was getting ready for this interview. And I thought I would share it to see what your thoughts are.

Dr. Christensen: Well, it's very interesting. I don't do a lot of neurotransmitter testing. I mean, I'll look at organic acids for those. Again, I do it more from a questionnaire standpoint, from a symptomatology standpoint to address this. And I think this is all unfold in areas of unfolding data and education and in terms of, for example, for the trichothecenes. My question is, well, okay, what else was going on in their situations and if they had trichothecenes and what else do they have? What other mycotoxins do they have? Do they have zearalenone, which is another really common one? And so, anyway, well, thank you for bringing that new data. I love it when my speakers have new things to teach me. Let's talk about how low GABA and how it can lead to both anxiety and poor sleep.

Trudy: So the other big root cause of anxiety is low GABA. And with low GABA, it's more the physical anxiety. So you'll feel tension in your body and your shoulders. A lot of people that I'm working with, you'll see them really [inaudible]. They may have pain issues. The insomnia is common with low GABA. They may have this desire to self-medicate in order to relax. And the common thing that we'll see with self-medication with low GABA is alcohol. So at the end of the day, they've got to have a glass of wine to relax, and that's their drug of choice. It can make sleep worse. It damages the gut lining. It depletes us of zinc, magnesium, vitamin B6, and using GABA as a supplement can boost those GABA levels.

So GABA stands for gamma-Aminobutyric acid. It's both a calming neurotransmitter, and it's an amino acid, and we use it as a supplement to get those levels up. Now, there's a lot of research on GABA. There's also a little bit of controversy about whether it can actually work. Does it cross the blood-brain barrier? Can it actually work? Does it only work if you've got a leaky blood-brain barrier? And we don't know all the answers. There seems to be more and more research saying that it works in the gut; it works via the vagus nerve. It works on our receptors throughout the body, which is why we see that physical tension dissipate. We've got GABA receptors in our muscles. We've got it in our endocrine system. There's a lot of research now on GABA helping with diabetes. So we've got a lot of receptors in the pancreas.

So the research on GABA is growing. Interestingly enough, there's a new study on GABA and theanine and how this combination helps with sleep and anxiety. So sometimes combining GABA with theanine can help. Sometimes combining GABA with tryptophan can also help if there's a sleep issue. But as I said earlier, it's good to do one at a time and then start to combine. So not to do them initially together. This particular paper talked about GABA and theanine improving sleep and anxiety. And the great thing is that too much GABA can—— Sorry. The bad thing is too much GABA can make you too tired. So a lot of people will hear about GABA, go to the health store, buy 500 milligrams of GABA, 750 milligrams of GABA, and it's too much. So I like to start with 125 milligrams of GABA and then build up from there.

And again, the GABA, like the tryptophan is taken on an empty stomach away from protein and doing a trial based on the questionnaire to determine what is going to work for you, and if it is going to work. So how bad is your physical tension, and how bad are your cravings for alcohol or whatever you use to calm down and then doing a trial of GABA and seeing what kind of reaction you get. Now, some people with sleep issues find that using more at night will work. So often we will have someone using maybe a GABA calm, which is a sublingual GABA during the day, 125 milligrams, maybe one or two, three or four times a day. And then maybe going up to 500 or 1000 milligrams at night, if their sleep is bad. The clue that it's too much is waking too tired. And a

lot of people will say, if they've taken too much without knowing that they should be using so much, they'll get like a nice and tough flush. So that's a clue that it is too much.

Dr. Christensen: Okay. So again, GABA can be used, especially for folks who have, again, a lot of muscle tension, as well as sleeping and those who want to self-medicate with alcohol. That's a biggie. I know personally that GABA has been something that was super helpful for me to take. And again, you mentioned that little controversy. Does it get to the blood-brain barrier? No, but I mean, to me, it's like, well, wait a minute, 90% of our neurotransmitters anyway are being produced in our intestines. So why are we worried about is it getting to the blood-brain barrier or not, and it is fascinating, again, this research that is kind of coming forth, there is GABA receptors on lots of different places. So all that is super helpful. So Trudy, in light of the coronavirus pandemic and for immune support during mycotoxin exposure, do you have something to share on GABA and immunity because I think that's a really important piece?

Trudy: Yes. So obviously, stress and anxiety and lack of sleep has a direct impact on immunity. So just using what we've talked about today is going to help with immune function. But there's actually some studies that talk specifically about GABA, N-theanine, and improved immune function, which I think is fascinating. I'm just going to read from a few papers here. This particular paper called *Relaxation and Immunity Enhancement: Effects of GABA Administration in Humans*. They talk about GABA working as a natural relaxant and reducing anxiety, but they say moreover, GABA administration could enhance immunity under stress conditions, which I think is very exciting. And then another paper on theanine as a functional food additive, they talk about theanine improving the body's system.

And one particular study highlighted the use of theanine as an intervention to decrease the incidents of upper respiratory tract infection symptoms via enhancing gamma and Delta T lymphocyte function. So when I saw that research, I just thought that just adds value to the fact that we are supporting someone who has anxiety, has sleep problems with using GABA, and using something like theanine. So it's just amazing. The more work that I do in this area with the neurotransmitters and the amino acids, the more support that I see on how to help in other areas, which I think is pretty exciting.

Dr. Christensen: Well, I think again, this is incredibly relevant right now because the narrative we're sort of being given is, oh gosh, there's nothing we can do. And there's a huge amount of what we can do to help prevent infections and help to strengthen our immune systems that do involve diet and nutrients and again, changing mental and brain habits. And I love this information that you've brought about GABA and theanine, and I was going to make kind of two comments about GABA. One, about the Phenibut form of GABA, which was taken off of the market. Maybe you can comment about that a little bit. And the second thing is that I use oral progesterone a lot again for sleep disorders and anxiety, especially in the second half of the menstrual cycle because it has GABA-like effects on the brain and also can help support the adrenals. So I find that oftentimes using a combination of GABA and some progesterone can make a real big difference in calming somebody's immune system down and helping—— I mean, calming their nervous system down and helping them improve the quality of sleep.

Trudy: I'm glad you brought up Phenibut. I was very vocal about it before it was taken off the market for many years. I had a lot of feedback from folks who had terrible effects from it as addicting as benzodiazepines, severe withdrawal symptoms. And at first, I had a few actual colleagues reach out to me and asked me, how had I come across it? And I started to look at some of the research and started to see case studies

being published. But what I also found is online forums where people were using it recreationally, and they were talking about how they could use it safely, so they didn't get addicted and what to do if they did get addicted and still using it. So when someone's addicted, it's very hard for them to stop, but it was these forums talking about how bad it was.

And I thought, wow if there's this much going on, we need to know about it. So I was very pleased that it was taken off the market, and I was concerned that there was so many practitioners who weren't aware of what the issues were. And then to your point about the progesterone. Yes, I'm a big fan of progesterone. GABA was a big lifesaver for me, and progesterone support initially, as I was going through peri-menopause, was tremendously supportive, and they work together so beautifully. GABA supporting progesterone, and then as you say, the progesterone is adding that extra element as well. So yes, I'm all for——

Dr. Christensen: Great combo. Yeah. And then everything to support our immune systems, too, when we calm down our nervous system, and we get out of that sympathetic fight or flight and that in and of itself is something that helps to raise the parasympathetic tone and that boosts immunity. So great. Trudy, one of the things that is sort of not being talked about through big media is ways that we can support our immune system. And we know that air quality is huge in terms of impacting the immune system and the lung and making susceptibility much higher for folks who get exposed to the infections, with coronavirus or anything else. And many of these cities that have been really severely affected with higher death rates and stuff are cities that have been very moldy to begin with or very high humidity levels. They also have high levels of air pollution. And so, these are some of the things that we're not talking about—also, very high levels of 5G. And we have a whole talk with Dr. Stephanie McCarter on that. So why don't you just comment a little bit about some of the other things that you have become aware of around this whole arena?

Trudy: Well, I'm glad you raised that point because we're hearing about nutrient status. We not hearing about vitamin D. We're not hearing about zinc. We're not hearing about quercetin. We certainly are not hearing about reducing stress levels and supporting GABA levels or serotonin levels, which is going to improve our sleep and reduce stress levels, which is thereby going to have an effect on our immunity. So, yes, I think it's really important that we are talking about all of this and something else that you said, which I would love you to repeat is that we going to have more consciousness about what's going on around us. Would you just say that again?

Dr. Christensen: Sure. I think that again, this is this blossoming in place as Jeffrey Smith put it in his talk on GMOs has given us an opportunity all as humanity to stop and ask questions about what are we doing to ourselves to poison ourselves and really who is running everything and making the decisions about our environment and that it behooves all of us to really work from an inner level as well to make choices about what we're going to eat and what we're going to—— Eating organic and using sustainable products and all that. That's huge. And I just want to remind everybody that anxiety is contagious and fear is contagious. And when you understand that 80% of what you're watching on the news and regular media is being paid for by the pharmaceutical industry. There's a certain message that is trying to come across, and fear and anxiety is one of those. And so, I know that you are aware that again, anxiety and fear are contagious, yes?

Trudy: Yes, absolutely. And if you're watching that media, and you don't know that there's nutritional solutions to some of the issues that we're dealing with, whether it be a viral infection, or whether it be something else, then it will drive that fear and that anxiety more. So I think having summits like this, interviewing experts, we are empowering

people so they know that there are other options that they can use in order to heal themselves, to recover, to feel, to have perfect health. So I think it's really great that we're talking about this and sharing this information.

Dr. Christensen: And let's just talk a little bit about DPA for boosting endorphins when you feel sad and overly emotional.

Trudy: Yeah. So DPA, D-Phenylalanine is another individual amino acid, and it's used to boost endorphins, which are feel-good brain chemicals. So think about when someone gives you a hug, or you do something nice for someone, and they thank you, you get that lovely sort of endorphin feeling. And the connection for toxic mold issues is that this what I discussed earlier, the sort of feeling of loss, loss of possessions, loss of your home, loss of your life as you know it, feeling very sad and feeling emotional. So the symptoms of low endorphins is this crying, weepy, feeling like you need to do something to self-medicate in order to feel comforted, to feel rewarded, to feel like you deserve it.

So I've seen really good results with using this amino acid when someone is going through something like dealing with mold toxicity. And the way DPA works is it destroys the enzyme that breaks down endorphins. So, in essence, you end up with higher levels of endorphins, and I don't use LDN in my practice, low-dose naltrexone, but it seems to—— I've been looking at some of the research. And there seems to be some sort of similar mechanisms. So it's working on the endorphins, possibly in a same way that LDN is used. And I know LDN is used a lot in the mold toxicity. Is that correct?

Dr. Christensen: Yes. And it's used in a lot of different things. It helps with gut issues. It can help with autoimmunity. It can help with an overstimulated nervous system. We have Ray Solano kind of addressing LDN. We have a couple of different of the practitioners on this summit talking about LDN, but I haven't ever used D-Phenylalanine unless it's been in a combination of something, but I haven't ever used it purposefully. What kind of dosing are you using?

Trudy: So you've probably have heard of DLPA, DL-Phenylalanine, and that's more available. You can certainly buy that over the counter and a lot more companies make it. And the starting dose for both the DLPA and the DPA is 500 milligrams. And again, it's dosed in between meals, and it can be used—— The DPA can be used any time of the day—first thing in the morning all the way through night time. The DLPA, because some of it converts to tyrosine, some of it converts to—— It supports catecholamines.

It can be a little bit stimulating. And when I first started doing this, sometimes we would use DLPA. At times, we'd use DPA, but I found that the DPA is definitely more effective for endorphin support. And then we don't have to worry about the L part of it, which is a little bit stimulating. And certainly, with the population that I work with who have anxiety, we don't want to give them something that may trigger the anxiety or make them a little bit worse. So the DPA on its own is fantastic. There's a product. Can I mention a product name here?

Dr. Christensen: Yeah.

Trudy: Yeah. There's a product called EndorphiGen, which has made by Lidtke, L-I-D-T-K-E. They're the company that I use for tryptophan, which I found to be more superior to other tryptophan products on the market. I've just been using it for many years and haven't had any issues with it, and they happen to make EndorphiGen, which is the DPA product as well. And the description that I give people is they just feel like it's a hug in a bottle. They just feel so good using it. Again, we like to use it—Open it up—For some people, it tastes like dark chocolate and when they put it on their tongue, and they get that effect right away. For others, they say it's too bitter. So it really is a taste thing, but it's a really nice amino acid. And certainly, for someone who

has a chronic illness, whether it's mold toxicity or some other kind of chronic illness, and they can't exercise, they're not able to boost their endorphins that way. So this is another way to get that endorphin boosting.

Now, the other thing that goes with the boosting endorphins is getting enough of the amino acids. So sometimes adding in a full spectrum amino acid blend can be helpful to help boost those endorphins as well. The big caution with that is making sure that amino blend does contain tryptophan because of some of the controversies around tryptophan. Some of the amino acid blends do not contain tryptophan, and in that situation, you're going to end up depleting serotonin in the same way that you would deplete it using gelatin or collagen. So just a little caution about that.

Dr. Christensen: Interesting. Okay. Again, so for folks with low endorphins, a lot of sadness, low mood, great loss to kind of the depression, the stress, there's grief piece, the DPA or D-Phenylalanine, and the other one, the LDPA, I think?

Trudy: DLPA.

Dr. Christensen: Well, I'm going to have to try those with folks. Again, it can be very helpful. Again, you like to take it in between meals and starting out at 500 milligrams, and you can do it also in smaller doses by opening the capsules and taking them. And I like that it tastes like chocolate for me.

Trudy: I love the way you summarize it. I think it's so great. My community loves that when people summarize because there's so much to hear and learn.

Dr. Christensen: Oh, well, that's great. Well, why don't you share a story, a client story for us before we close?

Trudy: Yes, I'm going to share a client story, client colleague story. I gave her some guidance. She's actually a colleague of mine who had severe mold issues and is now advocating. You may know her, Mickey Contini. When she was going through this, she shared how her anxiety was so bad. And then I came back off. I helped her. And then I came back afterward and asked her to describe what was going on with her. And one of the things that she described was this, and I'm going to read it to you. Heart pounding, my face was red. I was sweating. My thoughts were racing, and I felt like I was going to die. So this is a very common feeling when you have anxiety and a panic attack. And she thought: I wondered if I was having a heart attack.

My husband took me to the ER several times with panic attacks, heart palpitations, thinking it was the end, but I knew I was far from okay. I just knew something was wrong, and I didn't know what. So this was happening to her before she discovered that she had mold issues, and I can totally relate because I never ended up in the ER, but I thought I was going to die when I was having my panic attack. It was the most terrifying feeling. And I had no idea what it was. So this is common. This is what I hear from a lot of my clients with anxiety and with panic attacks. So she discovered that there was mold. She started to work with someone to remediate her house, but what she shared with me is, and so she contacted me, and I said, well, what are your symptoms?

And she described this. And I said, well, GABA is probably going to help. Tryptophan is probably going to help. DPA because she had a lot of emotional feelings because of what was going on with what she was discovering with her possessions. But she said, as I started tearing my house apart for remediation, I started using GABA calm like candy. At the beginning, I had to have a lot more than I do now. So when you first have the severe anxiety, you may need much higher doses and GABA calm, which is the sublingual GABA that I use, it takes me down a notch. And I feel my shoulder coming away from my ears, and I get closer to relaxing. So the nice thing about

these amino acids is you may need more of them initially when you're going through the severe anxiety, but then as you start to recover, you need less and less. As you start to remediate, as you start to do all the other things that folks are going to hear about in the summit to get rid of the mold, to start to recover, then you use less and less.

So the amino acids are ideally meant to be used short term. They give you that initial relief. They give you that hope. They give you that feeling that things are not as overwhelming. They're not as bad. You can feel less emotional about it. And it enables you to deal more easily with everything that is going on because it's a big deal going through this and remediating and going through this whole recovery process, working with doctors who may not believe that it is actually an issue and then finding someone to work with. So I just love them for that reason.

Dr. Christensen: Well, that sounds great and such, again, a hopeful note to end on and again, what I like to reassure folks is that even if you can't immediately move out, and a lot of people, they don't necessarily even have to move out depending on where they are on the spectrum of severity. But just working with changing our diet and using some basic nutrients, we can take enough of the toxic load off of our body that many symptoms will improve even before you do remediation or whatever. So I just say clean air, clean food, clean water, and a clear mind. Working on those things in very simple ways can be— That's what makes it so simple.

So thank you for really bringing in the role and the value of using amino acids, especially kind of right up front if one of your presenting symptoms is some severe anxiety, some of these psychiatric symptoms. So Trudy, where can we learn more about your work?

Trudy: So my book, *The Antianxiety Food Solution,* is the sort of Do It Yourself. I'm all about empowering my clients so they can do it themselves if they want to. If that's too overwhelming and you need support, I've got a home study course where I'll walk you through how to use the amino acids. My Facebook page, Trudy Scott Antianxiety Food Solution, is a great community. We have great discussions there. And then, I have the Anxiety Nutrition Institute where I teach practitioners on how to use the amino acids. And then, of course, as you mentioned earlier, I've got the *Anxiety Summit 6* coming up in November, and the theme of the summit is Toxins, Meds, and Infections. And I look forward to having you speak on the summit, talking about mold toxicity. So thanks very much for having me today.

Dr. Christensen: Okay. Thank you so much, Trudy. We certainly appreciate your expertise and really your concise way that you're explaining some very big concepts and very practical, doable, implementable ways. And I think that's what many folks need when they're in the middle of the brain fog. So thanks so much.

Trudy: Thank you.


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