

[145: Dr. Jill interviews Dr. Tom Bayne of Microbiome Labs on Advances in Gut Health](#)

Dr. Jill 0:12

Hey everybody, we are live!—Dr. Jill Live. You're back for another episode with a special guest today. Today we're talking about gut health and the top probiotics you should know about and be taking. I have a lot to say about that, which we'll dive into today. Just so you know, you can catch all of our previous episodes on my YouTube channel, which is just under my name on iTunes or Stitcher, or wherever you listen to or watch podcasts. And please stop in wherever you listen or watch and leave a review. If you're on YouTube, hit that subscribe button so that we can get this out to you and more people.

Dr. Jill 0:49

Today I have an amazing guest who's been a friend for a long time. Just thinking back, Tom, I'm going to introduce you in a second, but you were even the one who introduced me to the naturopath who ended up being in my office. So we've had this really neat... I remember where I was standing when you were like, "Hey, I know this person who might be a good fit for your office." And then it turned out to be that she's a beautiful friend of mine now, so thank you for that and for so many other things over the years. I just appreciate [that] you're an amazing human being. I love people like that who do great work in the business world and in the health world but are also amazing human beings, and you're one of those. So I'm super excited to have you today.

Dr. Jill 1:24

So for everybody listening, I want to introduce Dr. Tom. Dr. Tom Bayne is a chiropractic physician and a public speaker dedicated to understanding and improving the gut microbiome. As president of Microbiome Labs, Dr. Bayne travels around the world to educate other healthcare practitioners on the connection between the gut microbiome and many chronic diseases. His extensive understanding of supplement manufacturing and clinical experience have given him a unique ability to formulate integrative solutions for digestive and immune health. In his own clinic, Dr. Bayne has spent over 24 years helping his patients optimize their digestive health, improve autoimmune conditions, and enhance detoxification. Though he's very active in his role at Microbiome Labs, he continues to see patients a few days a week at his clinic, Pure Balance Natural Health in Glenview, Illinois, which is not far from where I grew up, Tom. So welcome, welcome. Thanks for coming on the show.

Dr. Tom Bayne 2:16

Thank you, Jill. Thank you for that intro. It's very great to be here. I'm excited to talk with you and spend some time with you.

Dr. Jill 2:19

Me too. And like I said, I just think the world of you and what you've done. I love your story. I know a little bit about that, but I want to share it with listeners. We have a lot of patients and clients, but we also have practitioners. To me, it's one of those really special stories about thinking outside the box, being curious, and dreaming big. And you've done some amazing, amazing [things]. I mean, I don't know of any other company that's made such a change in our field and really even transformed my own practice. Would you be able to share with us a little bit about your journey? Like, how did this happen? How did you start?

Dr. Tom Bayne 2:16

I guess one of the more pivotal points was actually meeting my wife. I was in chiropractic school, coming from an athletic trainer or sports medicine type of background. I met my wife, and her dad was a chiropractor. He did acupuncture, and he used botanicals and different things. It was more of a natural medicine approach to things. I'd start hanging out with her and start learning more about what she was learning. Afterward, her dad said, "I've got two chiropractic clinics," basically functional medicine clinics in the mid-90s. And he was transitioning to the business side. He was running a vitamin manufacturing and distribution company. So we went there, took over his practices, got really absorbed into the functional medicine world, and then helped him with his business and actually helped him sell his business. Metagenics had bought him in the early 2000s. So the Metagenics European headquarters are in Ostend, Belgium, which is where my wife is from. And [it's] where she grew up and where my father-in-law's company, [which] we built and sold to Metagenics in the early 2000s, [is located]. So I kind of recognized the business side of functional medicine at a very early age in my career. I always saw patients. I enjoyed it. But I really feel like I make better decisions as a businessman because of my background and practice, working with patients, and understanding pain points for physicians.

Dr. Tom Bayne 4:47

So after we sold to Metagenics, we moved back to the US and started a family practice in [inaudible] Chicago. But I always stayed active on the business side and had a few things that didn't quite pan out. I was importing some botanicals from Germany for a while and just doing a number of different things. But I became friends with Kiran Krishnan through another project. We had done a few things on

the side. He presented me with the initial information for the spores. Because he knew I had connections to Metagenics, he wanted me to sell the spores to Metagenics. So he gave me all this data on the spores, and I was blown away. Unfortunately for us, a number of the big boys that we shopped it to either didn't want it or didn't understand it. A lot of them just couldn't wrap their heads around it. Then the other ones were like, "Well, we'll just put it on the shelf next to all our other products."

Dr. Tom Bayne 5:58

It really is such a disruptive story. When we first launched the company, for the first two or three years, we only did one lecture, one webinar. When we were at a conference that we did, the title of the lecture was, "Forget What You Think You Know About Probiotics." It was just kind of in your face. It was like, "We can either do this and quietly do it, or we can go out in the middle of the playground, punch the bully in the nose, and see what happens." So we did. We went with the idea of what was happening in the marketplace in the mid-90s. You started to see products like *Lactobacillus sporogenes*. You started to hear some of these things. You had to really be into gut health to know about these things, but you would hear about them.

Dr. Tom Bayne 6:54

Lactobacillus sporogenes is actually mischaracterized [inaudible]. But back in the 90s, I remember using it and being like: "This stuff is pretty good. What is this stuff?" And it kind of made sense. But what you saw in the marketplace was that it was based on marketing principles; it really wasn't based on science. So it was like, "Okay, well, the best probiotics are in the refrigerator." Okay, well, where's the study that shows that? There isn't one. "More CFUs are better." Okay, where's that research? There is none. There's not one study that shows 50 billion is better than 10 billion. In fact, a lot of lacto-bifido-based research is actually done with one to two billion. They use the study on one to two billion to justify the 10 billion. It didn't make sense. And it was like, "Where does this end?" You know, now we've got 125 billion. Where are we going to stop with this? And what are you basing it on? And I was just as guilty, I would say. I talked in marketing talk when I talked about probiotics, "Well, you know, you need to rotate them every three months because," blah, blah, blah, blah. What did I base that on? Well, that's what my rep told me, so that's what I regurgitated. But there really was no research.

Dr. Tom Bayne 8:26

And then the last thing that is an annoying component of the functional medicine market is: "I have a research study on this ingredient, and I have a research study on this ingredient; I'm going to mix them together, and they're going to do these two things." That's not science. Especially when you're talking about biologics like bacteria, we don't know if they cross-react with each other or if they don't like each other. So you have to do finished product research; you have to have clinical studies on your finished product.

Dr. Tom Bayne 08:56

And when you look at the functional medicine space, it's almost [inaudible]. There's none. There was none when we launched. So we kind of just took the attitude of: We're going to disrupt this marketplace, and we're going to disrupt it with science. Before we launched, spores were all over agriculture, aquaculture, and veterinary medicine. The predominant probiotics that are used are for this, and the reason is because those types of industries measure results. If I give my cow this product and my cow is healthier, then I make more money, and then they can justify it. If they're just throwing dead bacteria at him and it doesn't do anything for the cow, then the farmer doesn't continue to do it.

Dr. Tom Bayne 09:43

So we were very fortunate to meet Dr. Simon Cutting, who is one of the most premier spore researchers in the world. He had a whole bacterial bank. Through different conversations with him, we were able to put together the five strains of spore-based bacteria that make up MegaSpore.

Dr. Jill 10:06

Yes. Amazing, amazing. I love hearing [about] the journey because my own journey coincides a little bit. Twenty-one years ago, I had cancer and then Crohn's disease. That was back in the early ages of what we knew about probiotics and things. All I remember is that I did not do well on any of the probiotics except Bacillus coagulans. That was the only thing out on the market then. Even as a practitioner, I was in medical school then, but I didn't know what it was. I just knew, "This one's different," right? So, it's funny, one of the reasons I've always been so passionate about your company and MegaSpore[Biotic] and all the probiotics since then is because I knew back then something was different about this. I didn't even know it was a spore back then; I just knew it was different and that it worked. It worked dramatically, and it wasn't a lot of billions. As you and I know, number one, it can be dead. These have been embryolized in amber for tens of thousands of years, if not

longer, and they still [inaudible], they work. And then [there was] the fact that all the studies on diversity were also something that caught my attention.

Dr. Jill 11:06

So, anyway, I've been a huge fan even before I knew it because I was like, "What is this thing that works so well for me?" And that was *Bacillus coagulans*. Now I'm on just *Bacillus subtilis*. It's one spore. It's your HU58. It is the one that I will give to my toughest patients, and I have yet to have anyone who has a reaction to it. Now, I'm sure there are some people who would, but literally, it's one of those probiotics that I can guarantee that they're going to do well on for even the most sensitive guts—the SIBO, the SIFO, the dysbiosis, the clostridia—you name it. There are so many things about the spores. I am just the biggest fan. And, of course, that's why your company has grown—because you have a product that really works.

Dr. Jill 11:41

So, it's neat to hear the backstory, though, because you've obviously had a really great business mind. It took someone like you and Kiran to really take it to the level [that it's at]. And I remember those lectures like, "Ooh, what is this?" But the proof is in the pudding for us who are in practice; it works!

Dr. Tom Bayne 12:00

Yes. Initially, we didn't know exactly what we had. And we each had day jobs, and this was a kind of side hustle thing in the beginning. The one thing that we understood, though, was that even the spore itself, if it's not in spore form, then it's useless. What we were noticing is that one, there were no multi-spore formulations on the market before we came along. But then, secondly, even some of the single strain products that were in the marketplace, when we'd evaluate them, sometimes there'd be 30% spore forms, meaning 70% of the product was probably being destroyed by the stomach acid, just like *Lactobacillus* and bifidobacteria get destroyed by the stomach acid.

Dr. Tom Bayne 12:55

There were so many interesting pieces to it. The first thing we did that we could afford, to be honest with you, was to have an independent laboratory just to analyze products. What does it say on the label? This one says 50 billion; how many are actually in the capsule when you analyze it? And then, how many survive through a simulated gastric system?—a pH of 1.2 for two hours, and then bile salts for 20 minutes.

Dr. Tom Bayne 13:31

So, this is a standard USP model. So we thought, "Well, let's do it!" So we took every product from the professional space and one or two from the retail space, and we analyzed them. Some of the products that said 50 billion on the product [package] actually had 250 billion in the capsule. Now, why would somebody put 250 billion in the capsule when they're only charging you for 50 billion? The reason is quite simple: They know their product is dying on the shelf. They know that they've got to have 50 billion by the expiration date.

Dr. Tom Bayne 14:06

So what was interesting is the overage—crazy amounts of overage—because of the loss of the bacteria over time. But it didn't matter. It didn't matter if there were 1 billion, like there were in some yogurts that we saw—there were just relatively small amounts. Or, we had 250 billion in a bottle that was labeled 50 billion. It didn't matter how many it was, they were completely destroyed in the gastric survivability remodel—not like 50% destroyed; they were completely destroyed. And then we did it with the spores, and they survived. So, that was the first thing that we did: Ours survives, yours doesn't. And that's all we had to go with.

Dr. Tom Bayne 14:52

And then we had been doing some vitamin K2 research, and we were doing that with a research guy at the University of North Texas. We just happened to be asking him: "What else have you got going? What other types of research are you doing?" He mentioned what was essentially a leaky gut study, and he was talking about it from the perspective of cardiovascular disease. And he's like: "I have a model. What we do is feed a high-fat, high-calorie meal to a patient, and then we monitor their blood. At the five-hour mark postprandially, we see a five to six-x spike in their LPS, and then we can test that against that. We can see if you can prevent it and treat it, or whatever it might be." And I was like, "That's a leaky gut study." I'm like, "Well, let's do it. Why not?" We had some data on the HU58; the subtilis work helped with the tight junctions and things like that. We had at least enough data to think, "Well, let's give it a shot."

Dr. Tom Bayne 16:01

What we were able to show was a 45% reduction in LPS. But in the control group, the placebo group, the LPS actually increased over time. So, there was actually more than a 70% difference between the two groups. So, basically, this proved that

one, humans have leaky gut. So, the first study that we did where we actually proved that healthy humans have permeability issues in their gut—

Dr. Jill 16:32

Was that studying the college students, that age group, or was it—

Dr. Tom Bayne 16:37

Yes. So, we fed college students a McDonald's breakfast or a cheese pizza from a gas station. Those are the two things that we found were able to create endotoxicity in healthy patients, and we were able to increase the amount of LPS that was circulating through their bloodstream.

Dr. Jill 16:58

Wow, Tom, I just want to pause it real quick for the listeners in case it just flew by you. So, cheese pizza from the gas station and a McDonald's breakfast, and you were able to take a healthy college kid and induce intestinal permeability. I just want to make sure that you're listening and that you hear that.

Dr. Jill (pre-recording) 17:12

Hey, everybody. I just stopped by to let you know that my new book, *Unexpected: Finding Resilience through Functional Medicine, Science, and Faith*, is now available for order wherever you purchase books. In this book, I share my own journey of overcoming a life-threatening illness and the tools, tips, tricks, hope, and resilience I found along the way. This book includes practical advice for things like cancer and Crohn's disease and other autoimmune conditions, infections like Lyme or Epstein-Barr, and mold- and biotoxin-related illnesses. What I really hope is that as you read this book, you find transformational wisdom for health and healing. If you want to get your own copy, stop by ReadUnexpected.com. There, you can also collect your free bonuses. So grab your copy today and begin your own transformational journey through functional medicine in finding resilience.

Dr. Tom Bayne 18:09

So, then we sent them home with a 30-day supply of the probiotic, and then [they] came back and did the same test again. Like we said, there was a 70% difference between the two groups. That was kind of the drop-the-mic moment; that was when we just exploded in growth. I remember going into a room with probably 200 of the leading chiropractors in the country in one room in Florida for the chiropractic nutrition convention. There had been a sales rep on before me, and

people were kind of [like], "ehhh." And I walked up and I said, "You know, when I was in my office on Tuesday seeing patients," and everybody just went "Oh" and sat up and started listening. And then I started saying, "And I've got this research study," and they were like: "What do you mean, you have a research study? We've never heard of that." It's like, "Well, I know, it's a thing in science; you research stuff sometimes. That's how products work; you don't just use marketing principles to do it. I know it's unique."

Dr. Tom Bayne 19:16

Being a chiropractor myself, I taught a lot in the chiropractic schools. Chiropractors are first responders; they like new stuff [and] want to be the first ones. So, for the first year and a half, we only did chiropractic shows, and then we started branching out into functional medicine shows. But it was that leaky gut study in 2017 that really put us on the map. I was in Phoenix last week doing a lecture with a bunch of doctors. I always took the approach of: I feel knowledge is power. So when I'm sitting with a patient, if somebody wants to help me with patients, then give me knowledge and give me the power I need to help that patient. I would want to be able to say to the patient: "Look, Mrs. Jones, you need to take this product. The reason you need to take this product is because this product has been proven to help patients that have your condition." That's my goal; if you're going to make me your doctor, put me [inaudible]. So, fortunately, with the leaky gut, we were able to do that with pretty much everybody that's coming into the office. Nobody comes into Flatiron who doesn't have evidence of LPS in the bloodstream after they eat a meal. So it's just the reality of the situation.

Dr. Tom Bayne 20:43

In our studies, we eliminated people who had any diagnosed conditions. So, these were what you would consider to be healthy adults. And 55% of them had postprandial endotoxemia; they had [inaudible]. So, it's an interesting thing. And when you talk about people that are sick or people that are—

Dr. Jill 21:06

And then you start looking at the data as far as obesity, cardiovascular disease, diabetes—I mean, it's all linked. In fact, Tom, I don't know if you know this, but let me show you something real quick here on my shelf. I still teach with you guys, but I've been a big fan and, of course, one of your lecturers. And I teach the cardiovascular module with Mark Houston at A4M. That was my part, LPS. So, this is the Integrative Cardiovascular [Medicine] textbook, and my chapter in there is on the gut, lipopolysaccharides, and the heart. It's so relevant; I mean, that's what

they're teaching in cardiovascular integrative medicine, and it comes from the stuff we're talking about right now.

Dr. Jill 21:44

And in there, I talk about the power of spores. And again, that's partially thanks to you because you brought that to my awareness, and I remember you having that "Aha!" when you sold the company. The same thing for me. That's why I've been such an advocate, because I'm like: "Number one, this makes sense. Number two, it works. Number three, you've got the data." So, great work because you're helping people like me go out in the world and change cardiovascular medicine.

Dr. Tom Bayne 22:07

Yes, and I hope it changes the industry. I hope that companies start being more responsible and doing finished product clinical research. I don't think you need to go out and do a bunch of studies on a B complex, but when you're talking about live bacteria, you're talking about changing the microbiome and different things like this; prove it! It doesn't cost a lot. I say this when I lecture: The future is really in the hands of the doctors now. They can control what happens in the marketplace by speaking with their dollars and only supporting companies that do the type of research that's necessary to empower them to be better doctors. I mean, it's really clear.

Dr. Jill 22:53

I love the fact, and you brought this up a couple of times, that it is so powerful: When you practice, you kind of lose your integrity a little bit if you stop practicing and go out and just... There's nothing wrong with people becoming authors, creatives, or whatever; everybody to their own, right? But I have such respect, and hopefully, I will always be someone who's in this clinic with patients because that keeps you honest. Bob Rountree used to say, "It keeps me honest." I loved how he said that, and it's true. The complexity of the human being is that we can write a protocol that works for so many people, but there's always going to be more complexity. And when we're in the clinic, we're continuing to find solutions and actually see real people. And now our climate of medicine is even more complex post-COVID, so we need this kind of curiosity in seeking science as a balance. So I appreciate that.

Dr. Tom Bayne 23:43

What was so fascinating to me is that we're talking about a leaky gut, but you've already brought up cardiovascular disease. And when we look at this whole COVID

fiasco, the people who didn't make it through COVID were people who had chronic leaky gut and had that cytokine-based inflammation.

Dr. Jill 24:06

We know the gut is such a core, core piece, in fact, more and more. Even recently, the Lyme conference started coming out with just a microbiome section, and it's like: We know the microbiome is so powerful, and the data continues to point to this.

Dr. Jill 24:18

So, Tom, obviously you and I are huge fans of spores. You guys have created some of the best products in the world; I really believe that. What's the future? I mean, you've got some of the Zenbiotics, or psychobiotics, as we call them. Is anything else on the horizon? Or, what else have you been working on that you think is going to be the next level up in gut health?

Dr. Tom Bayne 24:39

Microbiome Labs was acquired in 2021 by Novozymes. Basically, things just got so big. You've got a chiropractor and a microbiologist running a company. We had 125 employees around the country; it was just a monster. We grew so fast during COVID. I know COVID was a difficult thing for a lot of people, but we managed to grow massively through COVID. And when companies around the globe were looking at us, we obviously were checking off all the right boxes.

Dr. Tom Bayne 25:23

So we took the opportunity. We had a third partner who was a little bit older, and he wanted to get out. That's what initiated some of the conversations, and Novozymes came along. It's interesting, they're a biotechnology company. They're not a pharmaceutical company; they're a biotechnology company. They make enzymes for industrial purposes. Whatever laundry detergent you use, the enzymes in it have come from Novozymes. So they're a massive company, but they didn't do a lot in human health. So they started this human health side to their business. Right before they acquired us, they acquired PrecisionBiotics, which is an Irish company. PrecisionBiotics has some very unique cell signal molecule products, some metabolic response modifiers, and some bacteria that don't necessarily change your microbiome—they don't necessarily do what the spores do, but they treat really specific situations and are able to help people in certain situations.

Dr. Tom Bayne 26:30

One of the hero strains, in my opinion, is the 1714 strain of *Bifidobacterium longum*, and that's in the Zenbiome suite of products. It's a very unique product. It helps to shunt the breakdown of tryptophan away from the neuroinflammatory kynurenine/quinolinic acid side, a neurodegenerative neuroirritant, to the more neuroprotective side of serotonin and melatonin. That's a huge thing.

Dr. Tom Bayne 27:05

When patients were coming into the big hospitals in New York City and things like that with COVID in the beginning, they knew right away that these people had elevated levels of quinolinic acid. What's that all about? So, disrupted tryptophan breakdown is part of this neuroinflammatory cascade. The inflammation that goes along with it is kind of the brush fire that, when COVID comes in, becomes the fire everywhere. Then each of the organs gets choked off and the patient dies. Patients that had the worst outcome had high levels of quinolinic acid. We've known that forever; that's CDC information.

Dr. Tom Bayne 27:47

The 1714 strain is shown to shift the breakdown of tryptophan away from the neuroinflammatory and more towards the neuroprotective. We've been able to show that by doing that, we improve a patient's ability to cope with stress. We improve symptoms of anxiety and depression as a result of that shift in tryptophan breakdown. It's a very interesting product. When we're talking, it's like, "It's a *Bifidobacterium longum*." "So I'm going to eat this *Bifidobacterium longum* so my *Bifidobacterium longum* levels go up." No, it doesn't work that way.

Dr. Jill 28:35

It's an immune modulator, right?

Dr. Tom Bayne 28:37

This is a food source of peptidoglycans, and those peptidoglycans are going to shift your tryptophan breakdown and help reduce some of the perceptions of stress and your ability to manage stress and [not] feel anxious and depressed. So, it's definitely treating a symptom. From my approach, I sit down with somebody and say that whatever their condition is, they've been at it for a little while. There's some depression and anxiety that's either at the root or maybe it's the cause of them not being able to get better, whatever you say. But when I'm sitting in front of them, I'm seeing somebody who's in an immunological mess, and they've got some mental

health issues; they're anxious, they're depressed, and they're not feeling well mentally. Well, what I can do with that is use the 1714 strain to treat the symptoms so they feel better.

Dr. Tom Bayne 29:35

So, it's a little bit more of a positive feeling while I'm reconditioning their microbiome with the spores and making the long-term change to their immune and microbiome health that will be the long-term correction for all that. But I can treat the symptoms along the way because it might take me three months, six months, or nine months. It could take a long time to get the microbiome back where it needs to be. Some people don't have that amount of time, or they could be a lot more productive if their symptoms were more in check. I think it's a hero product for sure; it's just one of those things that's not available anywhere else; there's nowhere else you can get a food source of peptidoglycans. Peptidoglycans are interesting for the development of human behaviors. If you read about peptidoglycans, we know that there's some communication between mom and baby with peptidoglycans, and this initial development of personality traits has to do with certain types of peptidoglycans. But there's no food source of peptidoglycans; this is just a pregnancy thing. But now with these bacteria, they're covered in peptidoglycans, and so we're actually giving a food source of that.

Dr. Tom Bayne 30:59

So, it's a very unique product. That's one very interesting thing. And that's under the Microbiome Labs brand, because we're now under the Novozymes umbrella along with PrecisionBiotics. So we're representing the PrecisionBiotics branded ingredients in the physicians' market for the functional medicine balance. They also make immunity products too. They have a very interesting dead bacteria. It's dead. They're telling you right from the beginning: It's dead. There are no live bacteria in this thing. But what it does is get in the stomach, bind to *H. pylori*, and pull it out of the stomach and out of the small intestine. So, it's a different way of addressing *H. pylori* infection, which is the leading cause of stomach cancer around the world.

Dr. Tom Bayne 31:50

So, [these are] some very unique products, right? But what I love about it is that we haven't changed our scientific basis. We know what the spores do. We know that when we use spores, we're changing the patient's microbiome. We're improving the quality of the strains that are in their microbiome like a gardener would, right? You can just throw seeds on the grass every day, or you can till the soil, fertilize it, and

create an environment that's conducive for those things to grow. So, that's what the spores do; they recondition the whole microbiome and change that.

Dr. Jill 32:35

I can attest to that after 20 years on spores, and that's the only thing I've taken; honestly, it's a game changer. So, if you're listening, this is Zenbiome and Zenbiome COPE. We have them at drjillhealth.com. I'll be sure to include links for you if you want to know [about] those products wherever you're listening because they really are great. And just to summarize on your kynurenine/quinolinic acid, that got a little biochemical. You and I know exactly this pathway and what we're talking about. But for those of you listening, maybe it went over your head a little bit. This quinolinic acid can be measured on organic acid testing in urine, so if any of you have ever had an OAT test, you can look at quinolinic acid. One way you might know that you're sensitive to this or that you have high levels is if you don't do well with taking tryptophan or 5-HTP [because] you will shunt it into that pathway and create more inflammation. So these are those few people that I give tryptophan or 5-HTP, and instead of sleeping, they're awake all night, or they're anxious, or they don't feel well. So if that's you listening, this quinolinic acid pathway could be elevated, and then I would recommend the Zenbiome COPE for during the day and the ZenBiome SLEEP for at night. So, I love that you just talked about that pathway, though, because I know the effects of those, but I did know it was related to the quinolinic acid pathway, which is profound.

Dr. Tom Bayne 33:44

And we're seeing it in COVID long-haulers too.

Dr. Jill 33:44

Yes, absolutely.

Dr. Tom Bayne 33:45

We're seeing it in COVID long-haulers because of all the quinolinic acid levels; we're seeing dysfunctional tryptophan breakdowns.

Dr. Jill 33:52

Oh, that makes so much sense. Yes, it's way more common than it used to be. So, Tom, this has been so full of good information. And again, I always love learning from you and learning more about what you're doing. And kudos to you for [having] the business sense to bring this to market. If I have to think of one thing out there

in my store that's changed the practice the most in a good way, it's your products. It really, really is, so thank you.

Dr. Tom Bayne 34:16

That's awesome; I love hearing that. No, but it's the truth though. But being a practitioner and then spending time with practitioners... It's because of practitioners like you that we're beyond one product, right? If we had just been businesspeople, we would just stay [inaudible].

Dr. Jill 34:32

Right, "Let's do the MegaSpore[Biotic]"—exactly.

Dr. Tom Bayne 34:36

But there are pain points. The inflammatory bowel patients were really kind of our best teachers. But there was a need; not everybody got 100 percent better 100 percent of the time when they took the spores. So, we needed other products. And it was having conversations with doctors like you and getting what the pain points are and then thinking of things in a different way—that's how we've expanded to the whole line of products.

Dr. Jill 35:02

Yes. Well, great work. Thanks for all the good you put into the world and all the brilliance you bring. And again, you've changed millions of lives because of this. So, thank you, Tom. And thank you today for taking the time to come on and tell your story and tell about it, and hopefully in the next year or so, we'll have you back again with all the new things that are coming out. But I sure appreciate your time today.