Introduction and Dr. Blandu2019s Background

Welcome to another episode of Mycotoxins, Mold, and Chronic Illness Summit. I'm your host, Dr. Ann Shippy, and today we get to speak with one of my heroes, all time heroes.

He is Dr. Jeffrey Bland. He began his career as a professor of biochemistry. He's been involved in numerous academic institutions. He's the founder for the Institute of Functional Medicine.

He's a prolific writer, speaker and educator. And his current focus is through big, bold help for immunoregulation to enhance immunity. And he really is one of the most brilliant, curious people that I've ever met, the way he reads and synthesizes information and puts it into language that we can all understand and implement and been such a gift for me and my life.

And just welcome, Jeff. I'm so happy to have you. Well, thank you. Ann, you know, our friendship and collegial relationship goes back quite a few years now.

And I can tell you, because of people like you, that I'm still in the field at 77 years of age. So thank you very, very much. It's a real great privilege to talk with you about a topic that for me actually goes back to the seventies, which is this whole field of clinical mycology, so to speak, from a scientific perspective.

So I'm anxious to have a little repartee with you. Oh, that's all so fun. Where would you like to begin? Well, let me take the listener viewer back to the centuries ago and and run up from there.

And I want to talk about February 1692 to May 1693. Now, that's a little bit of time to go back to those dates because they represent in American history a very interesting issue that has been discussed in probably everybody's school learning sometime, and that's the so-called Salem Witch trials.

And, you know, there was a very, very interesting discussion that's gone on now for hundreds of years as to what led 20 women in Salem, Massachusetts, to be convicted of being witches and ultimately to be killed.

And the there is still debate. But one of the interesting possible contributors was that we year the winner of the prior to the witch trial for years that were very damp and wet in New England.

And we know for a fact that individuals at that time would store their grain through the winter in places that were not, you know, thermostatically controlled and humidity controlled like we can do today.

And even today, it's still such a problem, right? That's exactly right. So there was a very strong suggestion that potentially there was more that had been growing on this grain over the winter months and that that led to what's called ergothioneine poisoning.

Now, what is a ergothioneine? ergothioneine are a class of chemicals or within a class of chemicals that we can just call indoles. There are very, very members of family are very psychoactive.

And in fact, members of this family ultimately went on to the development of progressive psychoactive drugs in the 20th and 21st century that are derived out of the chemical structure of these molecules.

And these molecules are basically mold metabolites that they're produced by specific types of mold after just being one. And that then can result in the accumulation of the secondary metabolites in grain that's molding.

Salem Witch Trials and Early Mycotoxin History

And as you said, we're not free of this problem today. We have it. Even though we have a lot more technology in grain production, we still have problems with maybe lower levels, but sometimes clinically important levels of the psychoactive compounds.

Especially in some of these periods of time where we're having the heavy rains and the flooding and that kind of thing. I've heard people in the food industry saying that they wouldn't touch corn during those seasons because of it or or sometimes if it's super dried and they also have a lot of mold.

Yeah. And I think that this is a really interesting question because if you if you take very low levels of these molecules and I want to see a little level of them in parts per million, so that's they give you a feeling as to what I mean by primarily that would be one jigger removed per tank or vodka.

That would be a very dry martini. I love the way you put things into context. That's like you wouldn't even know it's there. That's exactly right. And those both levels, both in animals and humans, can lead to alterations of brain chemistry and in certain cases, psychosis and hallucinations and things of that nature that can produce chronic symptoms well before you get to that state.

So there was this debate for many, many years. It still goes on to some extent to whether part of maybe a significant contributor to the scale on which issues were built around some kind of hallucination, psychoactive compounds in the I guess, in a male population, principally because they were the ones making the judgments.

It is important, I guess, to close out on this debate which mycotoxin connection that it was built at a time where in Europe, particularly Germany, this concept of witches were very socially in the news and in the body politic.

And there is there is supposedly over a million women in Europe that were brought to trial over these periods of time, for which. My gosh, I had no idea it was so many people.

Yeah. Wasn't it wasn't all that not a million women were were all executed. But I think there were tens of thousands of women that were executed in in different European countries during this period.

So there was a a kind of a psychology going on at the time around which very and nature craft. And I mean, there's a whole story here about these women who supposedly had demonic principles because they really worshiped animals and things in the in nature and they could transform themselves into animals. And there's a whole thing about nature here that comes out of this period, which is quite interesting.

And the pushback by the church against these concepts of these alien views of spiritualism. But that's a whole another topic. So yeah, but it is interesting to even and applicable to what we're talking about today and that susceptibility, right?

So some people could eat the grains and not have any psychoactive active effects, just like I think some people today can eat the grains or have the respiratory effects of of of mold and others can't.

That's a fantastic segway to the next step along my learning curve that I wanted to share. Oh, because I hadn't had the pleasure, it was actually more than a pleasure.

It was really the fortune of meeting at a meeting being introduced in a meeting to a immunologist from Stanford. This was back in the 1980s and his name is Vincent Marinkovich, and Dr.

Marinkovich was a brilliant guy. He he actually got a degree in physics from Caltech. But then, like you, when you started engineering, he made a transition from physics into Harvard Med School and became an immunologist and was a clinical associate professor immunology and allergy at Stanford.

He had a private practice in Redwood City, California, and he was quite an enigmatic, charismatic guy, very brilliant. And he had some very, very discreet problem or discrete issues with his colleagues that didn't believe that there would be something like Mycotoxins that could produce clinical symptoms.

And in fact, in the eighties he became known as a mold doctor and he he basically birthed, I think, a lot of the interest in our field around mold and mold metabolites of which many people then picked up on.

And I mean, you being an expert in that field and I was reading just recently a press release that actually came out from the Global Indoor Health Network on Dr. Marinkovich components, actually.

And this Googling his name, talking about his contributions in bringing to much more understanding the concept of mycotoxicity and its relationship to all sorts of symptoms, some of which look like their allergy in some which looks like their toxicity.

Now that is a really important point. I believe in the branching of our understanding about mold and their companion organisms which are yeast, and that is they all have uniquely different personalities.

And I might say personally thing metabolic personalities and the bacteria. And so they produced a whole series of different metabolites because they have different genes that can describe them to different metabolic processes.

For instance, yeast can prevent sugar, bacteria that can can't. We know that because it can make alcohol and yeast make excuse me and the fungi make all of these extraordinary portfolio of compounds, some of which we have harnessed because they're the presenters of all the antibiotics.

That's where antibiotics were developed. And even now in the anti-aging era, where we hear about immature, the mammalian target of rapamycin, Rapamycin is a drug that's been used for transplant to prevent rejection.

But it's now it's kind of a drug that is receiving a lot of attention. That's an amazing drug because it is being called immature. Well, what is rapid myosin rapamycin?

It's a fungal metabolite from Easter Island, a unique fungus. It was found there. So, you know, these are interesting chapters and parts of our understanding.

So we can't say that they are more than Easter ball. They're clearly not. They play a very beneficial role, but they can have twisted personality depending upon what members of the family of law.

And they can create these twisted molecules, which then have mimicry or effects on our body in very different ways. And here is where I think the story is very interesting to me.

Mold, Mycotoxins, and Functional Medicine Origins

The question has been for individuals trying to understand the mechanism, because in medicine, as you talk about, I'm sure many times in medicine for whatever the reason, we don't believe until we've proven a mechanism or proven how it actually works.

Now, that's not always the case, but that is generally the case. As an engineer and as you as a scientist, It's nice when we understand why things work.

Yes, exactly. So in the case of how does a mole create this whole panoply of symptoms in people that can vary from central nervous system to immunological to joints based to gastrointestinal to cutaneous skin.

And we will detail these beautifully in your work and you deal with those kinds of people all the time. They present with these multiple symptomatology that are kind of experienced.

Well, the reason for that is that the more metabolites seem to have two effects on the human body, and those effects are interrelated. So I don't want to completely separate them, but they're actually studied by slightly different fields of science.

One is an immune effect. So we know that there can be an effect on immune cells of certain of these

characteristics of more. Even the cell walls of both are unique and their effect on our immune system.

And the other effect is the secondary small chemicals that they are produced by their metabolism, which is the toxic effects of taking poison. And so that would be like the microbe toxin effect versus the micro immune effect.

But both of those play together and it's hard to separate them out because they overlap clinically and they overlap because the immune system talks to the nervous system, which talks to the detoxification system.

So this is like the perfect problem for functional medicine which try to look at the upstream. Well, where do these things come from, whether they're where they are and try to treat the causes of the impact.

Because if we go upstream, we go to treat the cause and we got to look at what are the things that are interfacing between the body's ability to detoxify the gut immune system, the systemic immunity and the neurological system, all of which are inter interrelated with the symptoms that that patient have.

So I think that the field has been extraordinary in its evolution recently because now these fields for the first time in science or in cellular biology are starting to be seen to converge to all these.

What we used to consider at separate holidays, you know, immunology, gastroenterology and hepatology, all of these were separate fields of study. Now suddenly they're seeming to converge with shared mechanisms and that allows us to treat the cause and effect.

So I think that's a little bit of a run for of my history, starting really with what Dr. Marinkovich introduced me to back in the 1980s. I love how you you have this ability to really think in systems.

I think that's what's happened in medicine. It's gotten so siloed as that. A lot of people really can't think in systems like here. Do I put the puzzle pieces together.

So that was just such a beautiful analogy of how we can't really we can't look at just the heart. We can't just look at the brain because all of these signals and all of these systems in the body are talking to each other so brilliantly to try to keep us alive.

Yeah, well, I think you said something. Also, it's really important for people to understand that because it may be in hindsight, we always look back and we're kind of judgmental.

We say, well, why were people so silly before or why weren't they understanding their way? Were they were they dumb? Then the answer is, of course not.

But what happens with the evolution of knowledge is that we start off with trials, particularly in medicine. So the first things you worry about are people that are bleeding or falling over or have big lumps in their body or lesions, and they.

Say, Now. What do we do? And we don't really care how the person got here in the ambulance. We didn't need to treat them. So that's emergency room medicine.

And we have done a tremendous job actually over the past couple of hundred years evolving that model. So then after you get that, then you start asking questions that are the next level with your questions about the people that are kind of walking wounded or chronic conditions at a later stage become very severe and life threatening, but that may have a runway of increasing severity.

And you start to say, well, well, at the minute that wasn't so obvious. It would just have bad genes or that they just had an accident. There's something else going on here that interrelate to how their genes and their history is reflected about their experience in writing.

And that's a much more complicated story on which people are different from the other. And and so you start

getting into these next level of questions or what you had first asking those questions.

You don't have the tools to be able to answer. And that's really where we were when I started in history. A little over 40 years ago. We had really great questions and we had some Plato's analogy of the myth of the child and the myth of the cave.

On the wall of the cave, we had some shadows, but we didn't have the actual understanding of the objects that were producing it. But over the last 40 years, extraordinary advances have been made in cellular animal and human biology.

And I'm reminded of Siddartha Mukherjee's most recent book, which is a fantastic treatise on cell biology and how to a Biology, is actually transforming all of medicine.

And we've gone from a histology and anatomy and then a physiological growth level of understanding where we are now down to skill levels and trying to understand how you, how you affect smells like immune cells that are like the cardiac cell.

And then you see how ourselves interrelate with other cells. And we've made huge amounts of progress in that area, which takes us immediately to systems biology because cells don't work independently, so they work around their brethren and how they actually cooperate and communicate at a distance.

So I think that this is a logical evolution of knowledge, and that's a little bit why I'm so excited about Social. Hudson Because when we started the concept in 1990, we had again some shadows on the wall of the cave, maybe a little bit more clear.

But we we didn't have all the mechanistic these parts that had been filled in. So we kind of made some extrapolations. And so I guess it had hierarchical speculations, but I'm very excited to say that more than 80%, I think it's probably far greater than that of the things that we in 1990 built, the architecture of functional medicine around it.

That system, biology approach to health care have been proven to be substantially correct through more extensive work. And I find it now interesting to see how how long it's going to take for the body politic of medicine to start shifting over.

Because what we started down the road of functional medicine in Europe has master to was really a funny way of thinking about health. It wasn't just a series of protocol is a way of thinking of how the patient who lives in their own unique environment with their own diet, their own lifestyle, their own behavior patterns, how that is influencing their gene expression patterns and what we can do by interrogating that relationship to produce a personalized approach that unique to their needs.

We're not treating a condition or treating the individual. So I think all of these things are starting to fit together. And I, I go back to Dr. Frankovich, who really was was speaking about that when I first met in the early Let's Beatable.

You're making me kind of reflect back to the first time I heard you speak as you're as you're reflecting back. I had decided to go to medical school in the early nineties, and all I knew was I had gone through a major health crisis.

I love my, you know, my career as an engineer and IBM manager executive, but I got sick and I couldn't find anybody to really help me get to the root of it.

And so I had to figure it out myself. And by the time I did, I just knew I wanted to do medicine differently and I needed an M. D. degree, but I didn't know the path to get there.

So it's just so beautiful that meanwhile, you were developing these techniques that I was going to be looking for ultimately. So then I heard you speak was right around 2002, and we were in a conference room, I think, in Dallas, and my mind was blown.

You did a talk about inflammation and you you basically tied inflammation to almost all chronic illnesses that I knew of. So it was cerebral vascular disease, cardiovascular diabetes, autoimmune diseases, dementia, osteoporosis, cancer.

Just you had all the research to tie the immune system to everything. And so and then that was right around the time that then through you found, oh my gosh, there's functional medicine, because at that time I was just, you know, I had had a kid in med school and one in residency, so I had just gone into internal medicine practice, not what I wanted to be doing, but I needed to keep my skills moving forward.

And then, well, and you found functional medicine and got back on my path again for really helping people to to heal. So it's interesting to how your career has had this ongoing theme of really getting to the root of what is throwing the body into imbalances.

Well, thank you. You you're the exemplar of what I had hoped when I started down this path with my colleagues to form that we were hopeful that we could find a few of you out there.

I was told by many of my colleagues from my medical school experience and being a professor that I was being idealistic and doctors, once they had been certified, trained and done their board exams and so forth, the last thing they wanted to do was to go back and open up books of copy.

They didn't really like that much in the first place, you know, anatomy, physiology, biochemistry, toxicology and so forth. But I was, I guess, either naive or bold enough to say, you know, I think we'll find enough to to form a group.

And it's because of people like you that have now demonstrated that you can pick that information up and create it into a value proposition in your practice to help people and because of your leadership, other people have been doing it and are willing to try it themselves.

So we now have over 200,000 practitioners that have gone to functional medicine training over the last 32 years. So it's. Extraordinary. It really is. It blows me away.

And even today when I talk to my colleagues and I'll say something like this, they'll say, Well, you got to be kidding me. And I said, No, I'm not kidding you at all.

These are extraordinarily dedicated people. And they said, Well, you know, how do they how do they do that? And I said, Well, that's for you to learn.

We have whole courses. In fact, very, very quickly, my father was having some fairly severe neurological problems, such as Parkinson's, Parkinsonism. A number of years ago.

My parents were living down in Northern California. I live in Washington State, kind of doing the best job I could to help them at a distance. So my mom called me in tears one day and said, you know, I just don't know what to do with your father.

His doc doesn't seem to be really able to get a handle on this. And he's a combination internist, hematologist, then Ph. D.

Systems Biology, Methylation, and Chronic Illness

. And so I said, Well, have you had tested has he tested a levels of homocysteine and lithium on against it? Because I was wondering whether there was some underlying surrogate to Vitamin B12 deficiency that could have been contributing to some of my father's neurological symptoms.

And so my mom checked and the answer was, no, he didn't. I found it interesting because he was a hematologist, but he hadn't considered doing that and then exercising.

So I, I call him up and we had a conversation and he said, well, if you have. That's really interesting. I don't know much about this. Do you have any papers on this?

Well, you never want to react. So I said, Yeah, I do. He said, Well, can you translate something? And I said, Sure. Well, his nurse called the next day.

I said, No more papers, you're very machine. But he then I don't know if he read the papers or just said factor of how many things I sent him. But he then called me back and said, Well, let's look, this looks quite interesting.

So, you know, how do you do this with the folic acid and the vitamin B12? And so I gave him like very simple stuff and I gave him some suggestions and then he taught my mother how to do my own B12 injections and without oral contraceptives or folate supplement.

And he he did. Unbelievable. In fact, just to kind of tell me end of the story. And I think clinically it's very fascinating why my father had to move in the other bedroom away from my my mother because he was so restless and I didn't want to keep her away.

And then she would come in in the morning and help him get dressed. And he was really at the point where his one loving wife was working on his computer.

But he got to the point where to write a line of code on his computer would take him an hour because of his dexterity problem. So he was very seriously impaired.

So my mother, after this treatment, had started about a little over a month, I think something like six weeks, I got a call from a mother one morning and she was hysterical.

And I, I just was very worried because I thought, oh, something very bad happened. And it took me several minutes to get her calmed down. She was crying and just going on and on.

I couldn't even make sense out of what she would say. And then finally here to calm down, I said, So how bad is it with that? You know what's going on here?

No, no, no, no. It's not dead. It's revolutionary. For the first time in a year this morning, I woke up and there I was standing by the bed, fully dressed.

And can we go on a picnic today? Oh, all that's had for the next actually, four or five years. He returned back to his computer. He brought his language skills or improved, and he was he was very high functioning compared to where he was before.

It was it was a miracle. That's So then the doctor saw this is physician and this was pretty impressive for him. So he called me. He says, Well, this really works.

But I said, Well, it doesn't have the same result from everyone. I think this is a pretty dramatic example. But yes, we feel there are there are a lot of people who benefit from these types of thinking, these parts of metabolic functional thinking.

So he says, well, I'm going to get good at this. And they said, Oh, that's great. And he says, See how many courses? And so I said, In the ESL curriculum, it's starting with the and he says, back in those days, if the FMC so many years ago was to find these sessions in resonance and so it took a real commitment by people that come all the way out.

And it was, I think in part a 4 to 5 day session. I think I did my first week right after you switched it to one week. Oh, you were smarter than I was.

Just timing. I would have loved to wait. So there was a little bit silence on the phone for a second and he said, Oh,

that's interesting. Do you have anything I can do in a weekend?

Oh, And I said, Well, I don't think you really can learn this art in a weekend. You could be, you know, in sorry. But they said, Oh, well, you know, my time was very valuable.

I don't know if I could really afford it. It's been an amount of time. Well, the bottom line, just to add a little facetious ending to the story is my father did my mother changed my father's position to another person.

So a couple of years later, I just happened to pass this previous position to this hematologist. Then to his office. And he now had on a shingle that he was an internist, hematologist and a functional medicine provider.

And I thought that was interesting because he never really took a functional course other than the conversations. Right. That might be happening more than we'd like.

Yes, it was a little sobering. Anyway, I had heard there, but I don't know. It's actually a perfect thing to bring up because I pretty much check the methylation process in every single patient to know if a Diagnostics has a very detailed methylation process and you can check a lot of the methylation genes and especially for people with mild illness and with chronic disease, almost every I would say at least 90% of my patients, we have some optimizing to do on that pathway.

So it's I love this information for our audience today because if if you haven't checked your methylation pathways, you need to they need to to really take a look at that because it's so important for detoxification, for repair in so many different systems in the in the body depend on on B12 and folic acid and some other nutrients to work well so that I, I love that your dad got basically a good four or five years of living.

Yeah. That was remarkable. Something here about the methylation pattern is really insightful as well and that is when we started thinking about the network of our biology and how things are interrelated.

We could use as an example just the methylation process alone to kind of describe how things are interrelated so that the methylation process, as you've already alluded to, that relates to the DNA repair and DNA is the template, the template for everything.

And Athena gets injured. It leads to funny things that cells do. Most often the body recognizes the injured DNA and it starts producing a response to it, which is an antibody through our immune system to injured DNA.

And now you get the possibility of an immune adverse response. We could call it an autoimmune disease, but it comes as a consequence of imperfections in injury to DNA.

The other thing that and that's and that formation of proper DNA is in part related to the integrity of our methylation pathways. If we don't have proper methylation patterns, our DNA is more prone to injury and less able to repair itself.

So that would be number one. Number two is that we methylation program also is very important, as you suggested or indicated, for one of the principal ways for a molecule to get made with foreign and less toxic through the process of detoxification.

There are several different types of ways things can be toxic we talked about, but one of them is through methylation. So if you're not proper in your methylation process, you have a double barrel risk in your DNA and not repairing it, and the depreciation of your detoxification would set you up to more susceptibility than to things like moles and then chronic infection.

So I think all of these things fit together in a web of understanding as to how our genes and our lifestyle and our environment. And I was very interested.

There was a paper just published this year, actually, and what journal is it published in? It was published in the

Journal of Toxicology. Yeah. And it may have 2023 in the title of the paper is Mycotoxins in consumers awareness of recent progress and Future Challenges.

And I think it's an interesting review of how we in the consumer world become much more understanding of these relationships. If you would have talked about this in years ago, people would have been probably like it would have been a duh, I don't understand it, but now it's building syndrome and with climate change it's warm, moist environments and and the people getting more and more chronic symptoms.

And now we start looking at black mold and all these types of things that people now recognize that these these little critters, these organisms can produce these things that our body may respond very adversely to.

And now I think a lot of consumers are teaching their dog. That's how it goes, because they're going to the Web and they're finding out this information and they're bringing it back and saying, could this be part of my problem?

And if that practitioner has not had some training, they might say, well, I don't know much about that. And then they they seek you out because they're looking for chippies in the world that know something how to do about it.

Right. Well, and it's really actually amazing the number of physicians and chiropractors and other health care providers that I've had seek me out to help them as they're trying to figure out what's going on with their own health, too.

I mean, it's just such an epidemic that we're seeing. Yeah, it really is. And I think that, you know, the New England Journal of Medicine this last year particularly has I recognize that their editorial approach to what things are including because they get a huge number submissions and they have to select what articles they're going to publish based upon what they think is the most important of their readership, their doctor readership.

And there are more and more articles occurring in New England Journal of Medicine around climate change and attacks on human health. And so high temperatures, low temperatures, storms, humidity, how that interrelate with microorganisms that grow and flourish and are different conditions.

We now are starting to see environmental medicine become a major part of traditional family practice, whereas before maybe it was kind of a sidebar. I think it's now becoming a central feature of everything from pediatrics right up through geriatrics has this is concerned.

Yeah I, I think it is you know the gates are starting to open together to get this information out in comparison to 14 years or so ago when I started to at least recognize it, you know, my patients, I was missing it for the first couple of years.

Hey, you're just such an expert in so many different areas, and I'd love to delve in a little bit more into either the detoxification pathways or the microbiome or anything else that really inspires you because the way you bring it all together is just so extraordinarily well.

I think you you just said a whole mouthful. Or did you do you think about it? I mean, that's that's a whole textbook lecture just to incorporate what you put in one sentence or when one thought, because we know a recognized that the influence that more has cuts across disciplinary boundaries and it stretches us to start making these connections that were previously maybe even disadvantaged in medicine.

You weren't supposed to cross disciplinary boundaries or to stay in your lane. And, you know, I always say that the way that medicine was constantly when I was in my education and later in medical school as a professor, was that it was one chapter the time one organ system calls a book to take a test and then open for the next chapter.

And it's like each one of those was separate. And then we start recognizing, Oh, no, this is interrelationship is very, very powerful. So the the interrelationship that has captured recent attention in medicine is that of the of the microbiome, the Michael the viral, all these living critters that reside within our intestinal tract.

And, you know, for me it's a little bit like back to the future deja vu all over again, because I recognize that the first lecture that I gave for health care practitioners around this topic of endotoxin, the dysbiosis leaky gut where we started to use those terms the first time, 1985.

And the reason I know that is that a physician who is in that meeting that I was doing in 1985, my seminar had collected all the syllabi from the various to find similarity between two or three years, and he said he was cleaning out his office, he was downsizing, and he sent me on the cover of every one of the syllabi from every lecture that he had come to.

Oh, my God, I'd love to have that.

Microbiome, Candida, and Clinical Mycology

It was so cool because the first one was 1985. This lecture I gave on inflammation and dysbiosis. That was the first one that he came to. So I know that I've been talking about this for quite a while, and now the first is actually for the first probably, oh, maybe even 20 years, maybe from up to 2005.

When we talk about this process of leaky gut or all of those concepts, it was our postprandial endotoxin here, which means after Eat Your body gets a toxic load of stuff from your gut, those are totally like skull and crossbones in traditional medicine.

And I had a gastroenterologist that would come to my meetings and he would be constantly impolitely upset with me because I would talk about these things that they thought were problem, that they didn't exist because they were told that if you have toxin here, you're in the hospital in your you're very, very serious going in an emergency medicine, critical care.

And we were told about chronic endotoxin and they said, well, it doesn't exist either. Have it in adult. But now we know that all things have chronic status of different severity, very not this toxin here.

So these constructs of the immune system of the gut were some 60% of our immune system resides that either communicates with the three or £4 of living organisms that live in our gut, the microbiome, the viral in the Michael, and how that influences the immune system.

That sends chills out to the whole rest of the body because every organ system in our body has its own immune activity, including the brain has its own immune system called the microbiota.

So now we have cross-talk of all these things that are connected to what's going on in the gut and how our immune system is being alerted. Friend or both.

So these constructs which are really systems thinking obviously cut across all these disciplines of projection, is a bike. I own this body of knowledge, I'm a gastroenterologist, I own this body of knowledge, I'm an immunologist and so forth.

But the problem is they don't have the time or you aren't taking the time to recruit research like you do right? Yeah, I think that that for me as a career, you know this this now let's say I guess I started in 1978 was my first appointment as a professor.

So that's 53 years. That's hard to even say. The driving force for me has always been wondering why that's been the driving course. And I by the way, I think that not everybody should be on that horse as heartless as long as I've been on it, because I think why has to convert into what to do, what to do and this is important. Why?

But we need a few people that are the pioneers of why. So what to do? People will know what to do. So I think my role has been to continue to ask questions why and try to find some answers that they needed in clinical applications data.

Yeah. So if we go back to the to the microbiome story, it's a discussion with mycology. Now we go to orally orient trust and another really important medical doctor in the of our field, Dr.

Truscott was the person who wrote he was a physician in Georgia who was the first to really bring up the concept of chronic candidiasis, which is a yeast writes a member of the micro Mycology family right.

And honestly, I the percentage of patients that I'm seeing with this is is definitely on a really concerning trajectory. Yeah, it really is. And I think that you know his what often happens in our field, this is just a little historical insight from my perspective is that a physician or a researcher makes an observation and they go to their colleagues and they tell them about it.

They say, Hey, you know, I observe in this case, Dr. Cross. So I've observed that this chronic candidiasis, particularly started with women with greatest infections, is more than just a general problem. There.

There are systemic implications of this, and it's not so serious like you have with a fungal prominent septic infection. But there's something going on chronically that this person is experiencing these symptoms, everything from rashes and skin irritation to headaches to adrenals, to low energy and blah, blah, blah.

And so his colleagues started looking at that, and then they started say, well, what a safe way of treating. And they maintained a nice pattern, which was a fairly unobservable medication that works principally in the gut to kill yeast.

And so they started getting some clinical benefit from my down. And so that resulted in him going out and doing seminars on that. And then the body politic of medicine, because there were randomized clinical controlled trials and there were not the body of literature that they feel comfortable mechanistically to prove that this was a chronic condition that was described by trust that could be associated with chronic yeast overgrowth.

Then he started to be criticized. And so what he did is then he wrote a book for the general public, which became a bestseller. And so then this once you take it to the general public and it hasn't yet been endorsed by the Catechism of the Guild, now you really put yourself up for a problem because now suddenly you don't want to embarrass or make anyone look like they don't know what they're talking about.

So you start to get a pushback and you get all sorts of negative responses. But now, over years, actually over decades, that concept of chronic candidiasis has been proven correct because now we accept there be chronic conditions.

It's not just you're infected or not. There are different degrees. Severity of the is it with different clinical symptoms depending upon that person's state of health, their immune system, their genes, their diet, all sorts of variables.

That is the the incubator for functional medicine. That's where we shine. It really is. And when I see these chronic fungal infections, that's one of my clues to know to go look for Mycotoxins since so many of the mycotoxins are immunosuppressants.

Exactly right. So. So here, I think you said it beautifully. So is micro toxicology a toxic effect or an immunological effect? And the answer is yes, exactly.

And that's why you get these multiple symptoms of differing types and different people with different severity, duration and intensity, because it can affect these multiple systems in varied way.

And I think all of us like simple answer. So we don't like complication. We'd love just to say this is a gram negative bacteria, meaning it's this antibiotic and that's all you need to know.

Just go through the bacterium and give them that drug. Well, unfortunately, these chronic conditions are not that simplistic. Well, and I feel like that's really where.

No, but some of us that love practicing medicine, you know, we really do. It makes us feel like we're making

contributions every day because it's, you know, we're having to really use our brains, help our patients and figure things out, put the puzzle pieces together and not just, you know, oh, what what drug am I going to prescribe or really looking deeply and collaborating with the patient to?

Because, you know, it takes a lot of work on their part to to to implement the suggestions. So it feels really good when you can help help people really figure out what's wrong and not just give them the antibiotic for the gram negative kind of scenario.

I forget I really want to compliment you. So I'm I reflect back on the really the luxury I've had over the decades to have these kind of conversations with.

But people are really complicating their life by asking this question. You know, it's easier if we don't ask these questions. And in fact, if I could go back to Dr.

Marinkovich just for a second, I had a different because of the thought about this discussion with you, I decided I would go back and I would just trace what the Internet has to say about Dr.

Marinkovich. And I found this citation on the Internet. If you Google Vincent Marinkovich, you'll get a site, you'll get a link. And that link turned out to take me back to 1999 issue of Functional Medicine Update.

Oh my gosh. I'm going to be that after reading an. Audio magazine that I produced for 32 years, never missing a plot. And so I went in, I listened to me interviewing Dr.

Marinkovich, and I was just blown away thinking, Gee whiz, I could just 24 years ago. And the intelligence that he was bringing in this conversation and how how it's now started over 24 years to be integrated into we don't know where ideas start, right.

But we hope that an idea of when it starts, a good one will get in people's nervous system and transplant virally. And so the to me the the real look back that I think great sense of privilege is that these people have had the ability to speak to over these many years are individuals that left the idea as a free of charge contact for other people to pick up and to explore whether they can make a difference in the way they were managing patients.

And if I put all of those people together, it's like pearls on a necklace. It forms a beautiful piece of jewelry because these are really incredibly interesting thought leaders in the main or not, at the time they were saying it well received by their colleagues because they were saying something different and it was just.

Yeah. And now lastly, my last on this is I look at function medicine today and of the 100,000 plus individuals that are pictured I have participated in, of course are so 64% of them are female practitioner.

Well I didn't realize that. Now when I started in medical school I was teaching medical students as a faculty. I recall that we had less than 10% of the class as women.

Immune Rejuvenation and Polyphenol Research

This was 1970, and today there are more women, incoming freshmen, people in medical school, and there are men in American medical school. And so we're changing the complexion of the not just the gender, but maybe the tone, the kind of patterns of thinking that is architecting what the future of health care will look like.

And, you know, it's interesting. I had some I have sons, three sons, but I now have a granddaughter as well. And there's always been this running question as to whether there is a biological difference between the behavior of girls or boys or it's all this learned behavior difference.

And I think I can say without any question was speaking to the mothers and fathers of my granddaughter is that there is there's a biological difference in the way they. Asked and and so Claire.

Yeah. Having two sons to name one or. Better and one is worse it's just different systems in their whole perception. But I think one of the things that is really important for systems thinking is the ability to be collaborative and collaborative is a relationship, the communication, communication skills in the way you approach problem solving.

And I believe that the nervous system I can be so bold of women is really very skillful about communication, collaboration and interrelationships that lead to a group solving a problem.

And I think that's what we need right now. But the other, which is, you know, kind of the reductionistic method of taking a watch apart and knowing each piece part and then putting it back together, that's that's important too, You know, that that reductionistic kind of thinking is very good.

But we need a different kind of synthesis now, which is a different kind of collaborative process. So I'm very excited that social medicine is being guided by very powerful women, women like you that have engineering background and can take that kind of analytic thinking and then apply it in a co-operative process for problem solving.

We were talking earlier about other prominent women physicians in Continental. One is Sarah Gottfried, who works in academic and electrical engineering and computer science, then went to Harvard Medical School.

So we're starting to see many more of bringing these skills together to create solutions to these complex problem. I yeah, there's got to be some pretty sharp curves coming up here, I think, to get some collaborative thinking and some changes going.

I know we're we're starting to run out of time a little bit, but if you don't mind, a few more minutes to stop it. I know one of the things that you've really on in the last few years is really building stronger, healthier, more robust adaptive immune systems and resilience, which you mind just spending a couple of minutes talking about building resistance, Because I think the resilience because I think this is so important for our audience, because, you know, a lot of them are really feeling like there's so far to go with getting their health back and and any words of wisdom that you have on on being hopeful and being resilient again.

Well, the big aha for me and what ultimately drove me into doing what my wife Susan, was not all that happy about, and that's for me another company to go down.

She said, Yeah, come on, you're 77 years old, you don't need to do something. But I really felt like I did that. I needed to do something. It's all part of this pain or philosophy that I had, this extraordinary luxury, all the gifts of meaning.

These people and being able to do things. I never thought I'd be able to do that. I feel like I need to pay for it. And so what I learned that led me into big will help as a commune focused company was that the immune system is a lot more regenerative than I really understood, and a lot of this comes out as a consequence of breakthroughs that have been made in basic immunological sciences, particularly over the last ten years, because we've developed technologies to be able to look at a single immune cell one at a time and ask, what's their personality, and is it a one way street for an immune cell that once it's doing what it's doing, it'll never change?

And what I came to recognize, and this is of God, I should have known. I mean, I knew I knew this, but probably hadn't taken into account that every minute of our lives, our bodies are producing out of our bone, bone marrow.

It's literally hundreds of thousands, actually millions every minute of new immune cells, every second recruiting hundreds of pounds of every minute. We're producing millions.

And and therefore, our immune system is constantly turning back every three years or less, depending upon the state of that person's health. Their immune system cells will be different cells than they were the previous time.

So they're being reformed Now. The question is, and this is the real point of the realm, are the cells that are being formed as good as the one that replacing worse than the one we're replacing?

We're better and we have the chance to be any one of those three. There is this variability in flexibility depending upon how that body is translating at the immunological level, information that it's getting from our diet lifestyle, behavior patterns, toxic exposures and all these things, how it's translating that into the reconstruction of our immune system.

Now about whereas the birth of a new term I'm really good at and my mother said that, you know, if you don't have a word, you just make it up. I think that's probably true.

I made up a. Lot of work. I think I'm familiar with some of those terms. Most people call bland, isn't that right? And I've heard people say, What have you learned but then speak.

So here's here's a word that coined that. Now catching actually in the literature. I mean, rejuvenation because our immune system can be rejuvenated. It's so uncovering.

It really is. You know, I've often said that virtually nothing in the body's a one way street. Everything has a two way street component to it. Some of the back streets are not as wide as others, but everything has a back story, even neuro neuro neurological cells that we at once, you lose them, you never regain.

There is regenerative capacity. You can look at your your father, right, with Parkinson's. Yeah, exactly right. So this amino rejuvenation concept has really taken us into some exciting new areas of discovery.

We just finished a clinical study was listed on the link to the FDA site in which we study in humans. The effect that various polyphenols, your family of nutrients in plants have on epigenetic rejuvenation of immune cells and human.

As far as we know, it's the first human clinical trial it's ever been done of that type in which we actually use. They are a danger that we had made for us by Illumina that had 950,000 sites of immune epigenomic activity on the charts.

And then we studied people who immune cells with that gene to see if we can alter the epigenetic profiling by intervention with a polyphenol supplement and we were very, very excited to see that when we ran this through Informatic testing and we had over a terabytes of data on each subject, there was a huge amount of information and.

A lot of data like have should be able to get some pretty good statistics out of that right? And we did. And we've just are running this up for publication.

But what we found was that people have started off with epigenetically senescent immune cells. In other words, their immune cell age was older. The very converse thing is that when they did three months of this Polyphenol supplement, they kept the same diet and lifestyle that they had been doing previously.

Then in three months, we were able to significantly reduce their immunity. So in other words, the new cells that were formed over those three months regained their rejuvenating capability that they had lost.

And so, so groundbreaking. Yeah, it is. You know, it's an early stage. I don't want to overblow it because it's a pilot project and a pilot study, but it opens the door now for not only us but other people to take this and run with it.

The the exciting thing for us is that people have asked what was the the family of how many people to use it in the family. Probably people who use it in the orchestra, so to speak, was a mixture of polyphenols that were derived from an ancient food that has been lost in America about 200 years ago called Himalayan territory Buckwheat.

It has arisen which shows that is, it has some 5100 times the level of these immune active polyphenols of any other plant food that we know. And so it is a supercharged biochemical factory to produce these nutrients that are known to influence the immune system in a favorable way.

Food as Medicine, Resilience, and Closing Reflections

So we use the mixture of those principal flavonoids from the ternary buckwheat plant as the therapeutic intervention in this this program. So it pioneers the opening of the door about where food and medicine interact, interact.

So, you know, we're we're big believers that what happened in the September meeting at the presidential conference on hunger Food and Health which kind of brought up to the fore this concept of food as medicine.

We think that there is a huge amount of things ahead of us here as to how we both access and utilize specific complex nutrient profiles or goods in a therapeutic fashion.

It's not drug like it's functional, like in its ability to improve the function of all cells. And we're focusing on the immune cells because they are turning over all the time and they're doing work for us across every organ.

So that's our gateway of entry. After stem cells. And it's just so exciting to, you know, I really think it comes full circle, right? Food is medicine and drugs poison.

And to with what we've experienced in the last few years with, I've been really seeing people who thought they were helping, figuring out by getting COVID that they really didn't have the health immune systems that they thought they did.

And so to to be able to provide some some good solutions for helping people get get more resilience, get better immune systems is super exciting. Thank you. It's it's my last hurrah.

This is what I'm really focusing my energy on for the whatever time I've got available to put in do this. I think there's a huge amount of us to do to learn and to apply that will make benefits for those people.

Like you said, that they were healthy and then they got exposed to SARS-CoV-2 and they found their immune system wasn't as resilient as an expected. You know, it's kind of ironic that in America with the greatest amount of dollars per capita being spent on health care, with what we consider the most sophisticated health care system that we had, the least favorable outcome in terms of disease with COVID to COVID 19 of any other of the developed countries.

So it begs the question why? And I think it has to do with our general state of health, with ties to our immune system. Jeff I really you are such a special person for me and my life and just feeling into the ripple effect of all the people who you talk to, talk to, who've read or heard.

You become involved in functional medicine and just the ripple across the world. I, I know you've helped millions of people with that. The millions of people.

And I, I just don't know anybody else with such a brilliant mind and with really the drive to help humanity. Oh, my word, I'm deeply touched. And, you know, for all of us and you were talking about that earlier, you had a wonderful brunch with your family.

And the little miscast, I think, is those people that are closest to us. It's not out there in the Grand Theater of Life. It's the people closest to us that can give us the most honest and accurate indication of what we're doing with our lives. And they're not so impressed by stuff that's out there.

It's like more, well, we are close to our being. And I have to say that for me, I looked at my grandma, children, granddaughters, grandsons all the time to see how they are measuring what their grandfather is giving them in the context of the work that I'm still involved with and how I'm still present. And, you know, the days where I feel like I need to change the pattern of behavior finally so I'm more on target.

Those are the good self-correcting things that we get back from our loved ones. So I think this is all part of living. The complete experience of being human is being present for all sorts of things, some of which maybe a time they don't really like, but they're still important.

Important parts of our are being. Yeah, we got into the decision about how to solve the immigrant border problem this morning and it wasn't a light brunch at all and it was really fascinating to hear my kids and my mother and my sister all have a real conversation about, you know, we care so deeply about our country and about these people that are being affected and, you know, trying to come up with solutions.

So we have appreciate that our families are just so, so important for seeing where our minds are. Thank you. Well, and once again, I just want to reemphasize my my deep and authentic appreciation for you and what you represent and how you manage each of those lives that come up for your service.

And it's a great responsibility. But I also know that you measure up to that responsibility very well. Thank you so much. It's such an honor and so pass to get to practice medicine the way that I knew that I wanted to.

And I changed careers in the early nineties and a lot of it's because of you and because of all the work you put into functional medicine and in your asking why and then teaching us.

Thank you so much. Well be well let's let's have another chat in the future. Let's not let this go too long. I would love that and I'll see you soon.