The Inflamed Brain: How Your Unhealthy Gut Is Killing Your Brain Transcript

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Introduction to the Summit and Guest

Hello, everybody. This is doctor Bob Hoffman, your host for the Practice Upgrade Summit. It is so great to have you on to this class. I'm going to ask you to really have your undivided attention.

There's so much good in this class. You're going to learn a lot and you're going to meet a new hero for you. Today our topic is the inflamed brain how your unhealthy gut is killing your brain.

Many of you know that we focus on brain based chiropractic. And this is a topic that is 100% totally aligned with that. Our special guest today is Kieran Krishnan.

He's a research microbiology just and has been involved in the dietary supplement and nutritional market for over 20 years. He comes from a strict research background, having spent several years with hands on research and development in fields of molecular medicine and microbiology at the University of Iowa.

He left University Research to take several leadership positions in global companies in business development and product development. Most recently, Kieran is a co-founder and the Chief scientific Officer at Microbiome Labs, a leader in microbiome and probiotic research.

He is a frequent lecturer on the human microbiome at medical and nutritional conferences, and he is an expert guest on national radio and satellite radio, and has been a guest speaker on several health summits as a microbiome expert.

He's currently involved in over 18 novel human clinical trials on probiotics and the human microbiome. Kieran is also on the scientific advisory board for seven other companies in this industry, and Kieran has published clinical trials in peer reviewed scientific journals, and several global patents are in his name.

Welcome to the Practice Upgrade Summit. Kieran, it's a pleasure to have you. Thank you so much for having me, Bob. This is a fantastic opportunity. I'm very excited to be here. Thanks.

So I'm sure most of the people watching this have some sense, but there are some that probably don't. Let's elevate the knowledge. What is a microbiome?

Where did that name come from? Why would the people watching this really need to know about this? Yeah. So there's a couple of components of that name.

And and they're very significant.

What the Microbiome Is and Why It Matters

So the first part being micro which refers to microorganisms, which includes things like viruses, bacteria, fungi, protozoa, all of these organisms that exist in and on the system.

But the biome component of it indicates that it's, a commensal, ecosystem. And it's not just the organisms themselves, but their genetic elements as well.

And that makes it even more important than you. Then you would reference when you look at just the microbes. The reason for that is, as we know, genes control metabolic function.

Genes control responses in cellular activity. And when we when we look deeper into it, we've got about 22,000 or so functional human genes in our system.

Compare that to about 3.5 million functional microbial genes in our system. All right. So we've got a 150 times more metabolic activity coming from microbes that inhabit our system than we do our own genetic elements.

So that just gives you a slight clue of how impactful these microbes are on our day to day function. That's really terrific and awesome information. So the microbiome is the gut microbiome.

And so much information is out there today. Current information. If you're just paying attention, you can't help but hear, read about, listen about how important the gut microbiome is, especially during the the Covid pandemic.

You know, we want to increase immunity, increase health, and the gut microbiome has been front and center. So, Karen, can we talk in some depth about how the gut and the brain is actually connected?

Yeah. So in fact there's a there's a direct two way connection between the gut and the brain. It's autonomous in that a lot of it we can't control you know, deliberately control.

The microbes are in control. In large part, the gut is referred to typically as a second brain. I would say it's the other brain. Not being able to effectively rank one over the other.

They're both very active centers of the body. And then they're and they're in communication all day long. There's a number of ways of the gut in the brain are connected.

One of the most profound ways is through the enteric nervous system. So all of the neurons that line the GI tract make up a really, really dense network of neurological, tissue.

And in fact, it's only second to the brain in terms of the number of nerve endings. In fact, the gut has more nerve endings in the spinal cord itself.

And so that neurological tissue that lines the entire, surface of the GI tract is directly connected to the brain through the vagus nerve. And the microbes have full access to that neurological system.

So the microbes can actually create compounds that it sends through the enteric nervous system, both good and bad things. And we could talk about examples of each that go directly to our brain and completely affect our function and behavior in the same.

In the same regard, the brain can send messages down to the microbes as well. Now, beyond the neurological side, there is the lymphatic system over. I think it was 5 or 6 years ago.

We learned that the brain has a very elaborate lymphatic system, which wasn't previously known, through the lymphatic system, microbes have access to the brain.

And then, of course, through, immunological, factors as well. So the turning on of certain immuno immunological responses in the gut has a deep impact on the brain.

And one of the things I always say when I do a gut brain lectures is, over time, the most toxic thing to your brain is going to be a dysfunctional gut.

There's lots of evidence behind that that's really profound. And and again, every one of the practitioners watching and listening to this have to take notice of this.

How the Gut and Brain Communicate

If you're serious about getting superior clinical outcomes, predictable clinical outcomes, you can't ignore the gut brain axis. I mean, it's just absolutely essential.

And, the gut I I've read please confirm this. The gut actually communicates more with the brain than the brain with

the gut, even though it is a two way street.

Is that correct? That's absolutely right. Yeah. I mean, the the amount of, biological metabolic effects that are going on in the gut that then gets sent to the brain directly from far outweighs the amount coming down the other way.

And in fact, a lot of the responses of the brain will be in response to something that's coming up from the gut, and and the gut in the brain are continuously talking.

And keep in mind that the gut is under full control of microbes. You know, virtually every aspect of what happens in the gut, including all of the immunological activity where, you know, more than 70% or so of all your immune tissue in your body exists in the gut.

All of that activity is under control of microbes. Wow. So when you say that the unhealthy gut is killing your brain, you've already made mention that it causes some neurological disorders.

It can probably impair cognitive function. But even on a more subtle level, Karen, I'm sure it affects mood, emotional eating, anxiety, or depression.

There's probably a whole host of mental challenges, emotional challenges that people have when they have an unhealthy gut as well. Absolutely. Yeah. Let's go through a few examples so people can really sink their teeth into why this is so important, right.

So, let's look at one simple example of the production of neurotransmitters. So we know our endocrine system produces a whole host of neurotransmitters.

And as it turns out, all of those neurotransmitters are also produced in the gut. The gut is really a secondary endocrine system. And as it turns out, the endocrine system calls upon the gut for support and production of these neurotransmitters.

And times, especially in times of stress and higher demand. And if the gut cannot respond because the gut is unhealthy or dis biotic or dysfunctional, then the endocrine system goes under, overtake becomes overtaxed.

So the whole idea of things like, adrenal fatigue, right. Why would adrenal fatigue occur? Well, it's because the adrenals are calling on the gut microbes to produce a lot of the same, hormones and neurotransmitters, and the gut is not responding.

So then the adrenal system goes under, under fatigue. So a really good example of some of those neurotransmitters that are critically important are things like brain derived neurotrophic factor.

Brain derived neurotrophic factor is a really important you know, neurotransmitter that gets sent up to the brain that is really important for repair and function of the brain, especially through the rest phase, especially through the parasympathetic activation.

Then you've got things like Gaba, which is also, of course, really important for, parasympathetic activation, rest and repair. That whole complex is dependent in large part on Gaba.

Then we've got serotonin, the happy hormone, 90% of which is actually produced in the gut and not in the brain or other regions. You've got things like dopamine, which is, feeds the reward centers of the brain, and affects behavior and addiction and all that in a really major way.

Those things are largely produced in the gut. So if the gut is dysfunctional, you already have a significant disadvantage because you're not producing critical things like Bdnf, Gaba, serotonin in a dopamine, all of these critical neurotransmitters that you need to function optimally, and especially under stressful conditions.

That's a really big important factor here, right? Because all we have to do is look around us and we could see how

stressful the world is, right? Whether it's, it's, political, it's financial, whether it's this pandemic, it's all of these things that are really very stressful to our system and put a huge burden and tax on our system.

Then on top of that, if your gut is dysfunctional, you're missing half of your capability of dealing with these things, you know, so it becomes really easy for the body to break down.

And that's just one example. There's all kinds of metabolic examples. You know, I let me go let me mention another one. Leaky gut. I think everyone who's, watching this has heard of leaky gut.

But one of the consequences of leaky gut is the translocation of something called LPs. Like bio polysaccharide. This is an endotoxin that's produced at high amounts in the gut microbiota.

And the reason it's produced is because it's, it's a component of gram negative bacteria cell membranes. And it's perfectly normal and fine when it's on the bacterial cell membrane or through the bacterial cell membrane.

But when the bacteria dies and releases it, that's when it can become a problem. If it's allowed to leak through into your circulation. And about 70% or more of the microbes that live in your gut.

And this includes the beneficial commensal bacteria are gram negative bacteria. So they're producing this endotoxin constantly. If your gut is leaky, some of that endotoxin is being allowed to leak through.

One of the things the endotoxin does is it gets into the entire nervous system. It makes its way up the vagus nerve in the lodges itself into something called a dorsal vagal complex.

When it lodges itself in the dorsal vagal complex, it generates an inflammatory response, shutting off a large part of the communication between the gut and the brain, and one of the key parts of the communication that it shuts off is the movement of the bowels, right.

Gut Dysfunction, Neurotransmitters, and Inflammation

The peristaltic contractions that are required to move food through and digested, and then also the migrating water complex, which is that electrical sweeping that cleans up the bowels.

So what happens then when leaky gut stops that communication? Well, then you get stasis in the bowel and stasis in the bowel leads to chronic constipation, at the very least.

And then it develops into things like Sibo, small intestinal bacterial overgrowth, severe food intolerances, gluten intolerance, dairy intolerances. You get severely inflamed, digestive system.

You start getting a taxa shift in the small bowel where you get more gram negative bacteria, and then those gram negative bacteria start to affect your large bowel as well, producing compounds like hydrogen sulfide that create inflammation in the lining of a large bowel.

Now you've you're developing early stages of colitis in your large bowel, all of which impairs your ability to digest and assimilate and take in nutrients. Right.

So not only is the disease process going on, but it's also affecting your ability to just access nutrients from the food that you're eating, which then impacts virtually every part of your body, including your brain that requires so many calories and so, so much rich nutrition and nutrition to function.

That that it now it starts to get starved. Right? So that's just another mechanism by which, dysfunctional gut can have such a huge impact on your brain and virtually every other part of the body.

Wow. That's very, very telling. Let's let's put a little of our attention on what you mentioned just a moment ago and earlier in the conversation as well.

And that's the role of the vagus nerve in the gut brain connection. You know, I'm of the belief that the vagus nerve is perhaps the single most important narrowing the entire body.

It's literally what connects our brain to our heart, to our gut. It's it's what's responsible for the inflammatory response. And dozens and dozens of other critical things.

Talk a little bit about the vagus nerve and about how the gut impacts the vagus nerve, and how vagus nerve impacts the gut. If you would. Yeah, absolutely.

So, you know, one of the real, key functional components within the vagus nerve is the control of the sympathetic parasympathetic tone. Right. They would call it the simpatico vagal tone of the body, meaning, are you in the sympathetic state more often than you should be, or in the parasympathetic state more often than you should be?

And both of those are important for overall function. However, when you are in this elevated sympathetic state all the time, which is which is of course could, controlled by the vagus nerve and the signals that are going between the gut in the brain.

It affects the gut in a negative way, because one of the effects of the power of the sympathetic activation is the increased release of stress hormones.

And when stress hormones go up, one of the one of the artifacts of that is you actually get overgrowth of opportunistic pathogens in your system. So one of the things, one of the factors that pathogens and opportunistic pathogens in particular do really well is they're really good at hanging out in your system, whether it's in your gut, in your upper respiratory tract, in your dorsal root ganglia, in your in your ears.

All of these areas up here, like Epstein-Barr, cytomegalovirus can hang on up here for decades on end. And they're really good at laying dormant, not, not triggering the immune system.

So they're not, attracting the immune response towards them, but the moment they sense that the body's under stress and they measure things like, epinephrine, norepinephrine and cortisol and all that, when they see those levels go up, then they start, turning on their Berlin's genes because they understand through the course of evolution that it means that their system is compromised.

This is a good time for them to try to take over. So you've got this, this, sympathetic, parasympathetic tone that's going on and and a change in the brain that can send a signal to the gut, which is a, sympathetic activation can actually change the microbiome in the gut.

And then some of these, organisms that overgrow in that state, one of the things that they do is they produce neurotransmitters that give you more panic and anxiety.

Right. And the reason they do that is because they want to maintain that sympathetic tone. They want to maintain that stress condition. So now you've got these organisms that are growing in your in your gut.

And then they're sending more signals that actually shoot up the vagus nerve that create this sympathetic, activation in the brain. And then, and then the parasympathetic activation is also extremely important because parasympathetic activation is known as a rest and digest component of it.

Right? Your ability to actually break down, assimilate, and take in food and nutrients is dependent on parasympathetic activation. And there's data that shows that there are microbes that produce critical compounds to, to increase parasympathetic activation as well.

So you've got this channel, this vagus nerve that basically controls the total tonality within your body. That critical communication between the gut in the brain.

And both can affect one another, you know, and and ultimately, if you're, if your vagus nerve gets compromised,

meaning through an inflammatory process which can occur, I just I describe one where you have the, impedance of the dorsal root legal complex through inflammation.

Then you really change the communication process, and you can very much get stuck in one of those tonalities versus the other. You can be long term, sympathetically activated, which is a devastating, you know, state to be in.

Yeah. And that's a part of Steven Porges is poly vagal theory. And being an activating the dorsal Vega's is never good for us. We always want to activate the ventral vagus.

You know, part of our teaching here and is, is we teach our doctors that we should be telling the patients that the autonomic nervous system has two branches, the survival nervous system and the healing nervous system.

Instead of referring to it as sympathetic parasympathetic because the sympathetic primary goal it's a reason to exist is survival at all costs, even if it's damaging other things.

You know, marinating in cortisol is never a good thing. And that's what so many people are doing. You know, probably 90% of the people are trapped in sympathetic dominance.

And, that it just sets you want to go the fast lane, racing towards sickness and disease. Whereas the parasympathetic nervous system is our healing nervous system.

All healing is a parasympathetic function. And looking at this from a chiropractic point of view, you look at it brilliantly from a gut nutritional, enzyme hormonal perspective.

You probably forgot more than I will ever know. But looking at this from a chiropractic point of view, the most important vertebra in the entire spine that affects autonomic function, that down regulate sympathetic stress and reengage is parasympathetic function, is adjusting the first cervical vertebrae, Atlas vertebra, the occiput atlas articulation, and the most important bone in the cranium that is involved in all of this is the sphenoid.

There's little bone right behind your eye that articulates with all the bones in the cranium that when we were in fight, flight for too long, we go to the third F, we go from fight flight to freeze.

And what really is frozen is the sphenoid, which has these micro movements. It's kind of like the orchestra leader to the entire cranium. It freezes, affecting everything and throwing the whole nervous system into chaos.

So looking at it from any angle imaginable, healing the gut, healing the brain, improving vagal tone, improving or reengaging parasympathetic, healing activity down, regulating sympathetic survival activity are the things that we all have to focus on if we want predictable, excellent clinical outcomes.

Yeah, absolutely. You know, and I think a really important piece that gets overlooked, is, is how a dysfunctional microbiome can keep you in that sympathetic state because there are microbes that do better when you're in the sympathetic state.

And that's what they're fighting to maintain.

The Vagus Nerve and Autonomic Balance

So they produce toxins and compounds and all that, that increase your sympathetic tone. You know, and so as you're doing all of the other, modulations to improve the parasympathetic tone, fixing the gut becomes a really critical part of that whole picture.

Right? So I think it's it's great to make that connection, you know, you know, chiropractic has been around for 125 years. And the founder of chiropractic all the way back then said that these subluxation of the spine are caused by three teas thoughts, toxins and traumas.

And, the chiropractic profession, in my opinion, has put too much emphasis, emphasis on the physical causes. But the chemical causes, and even more so the emotional causes are far more prevalent, far more common, and far more devastating.

So all of that is impacting, again, the gut brain axis and the vagus nerve. And we've got to pay attention to that. And there are ways to fix that. So let let's start to shift our conversation.

This is brilliant work I'm so impressed with you. Let's start shifting to some of the more practical things. Yeah I'm sure that there are certain foods that are essential to heal the good bacteria and viruses in our gut, and there are probably terrible things that some of us consume unintentionally, unknowingly, that are just allowing the bad bacteria to flourish.

Could you could you get into that with the people watching this right now? Yeah, absolutely. So, you know, the the general, idea around feeding the microbiome appropriately for, for health is, is to increase the diversity of what you're eating.

You know, that more and more studies have shown that the diversity in your diet will dictate the diverse and function of your microbiome. And ultimately, through the last ten years of microbiome research, the same theme keeps coming up.

And that is increase in diversity in the gut microbiome is associated with health. And also increasing diversity will dictate how long you live. There are longevity studies that show that, diversity in your gut microbiome is a better predictor of how long you live and what your health outcomes will look like when you're in your 80s, 90s and beyond.

Then any other marker that they were looking at. And so, you know, we cannot overstate the importance of the diversity. So let's look at our ancestors, right.

They they ate somewhere around 600 different types of foods annually. And, your average Westerner maybe eats 10 or 15, you know, so it's about increasing the diversity of their diet a little bit.

They don't have to go out and become a world class chef and figure out how to cook all kinds of complex things. The recommendation I make to people is just, you know, simply add in something new to your diet that you didn't eat.

You haven't eaten previously each week. Right? So, and I always recommend people go to an ethnic grocery store like the Asian market that we have here or Middle Eastern grocery store, because they'll have roots and tubers and fruits and even meats that are different than what you will find in your grocery store.

And if you add small amounts of those things each week, you can really improve the diversity of your microbiome. And then the things that are clearly detrimental to the microbiome are things that are going to be covered in things like roundup, you know, glyphosate, the herbicides and pesticides, those things, not only are they antimicrobial, but they are the worst kind of antimicrobial because they selectively kill good bacteria.

Antibiotics are bad enough because antibiotics will kill everything. And then as things try to grow back, they grow back into this biotic state. But roundup and those types of pesticides and herbicides, they selectively kill the good bacteria and pathogens like Klebsiella, Pseudomonas and all that are resistant to them.

You know, Clostridium. And so over time, as you're getting exposed to these processed foods like your Cheerios and, you know, your non-organic type of foods that then are covered in these, in these pesticides, herbicides, you're driving a very significant type of dysbiosis in the gut microbiome.

So just, just doing those two things, just increasing the diversity in your diet by selecting some new types of foods to add in. Of course, trying to focus on organic as much as you can and cleaner foods so that you're not getting huge exposure to these herbicides and pesticides, and then avoiding the things that are covered in herbicides and

pesticides, which is basically packaged foods.

And, fast foods and things like that. Just those two things alone can have a huge impact on your microbiome bringing down the sugar intake. We'll do that as well.

So one of the things that sugar tends to do within the microbiome is it feeds things like Candida. Right. Opportunistic fungus that grows within the gut.

One of the ways that can be to loves to survive is it is it forms partnerships with pathogens that do a great job of making biofilms. So they will actually scaffold themselves with things like certain, types of streptococcus, for example, or Staphylococcus in the gut, where they will form this combination of, of Candida and staff and strep in a biofilm structure where whereby it becomes really hard for the immune system and the other microbes that compete with them to get at them.

And then they will continue to grow in that opportunistic fashion as you keep feeding that Candida. More sugar, you know, so sugar can have a huge detrimental impact on your gut microbiome.

Another very simple tip for the gut microbiome is basically providing some period where you're not eating, you know, a little bit of intermittent fasting.

Studies show that intermittent fasting increases the diversity in the microbiome, and it especially increases the growth of certain keystone strains. These are species within the gut microbiome that play a really important role in maintaining the balance among the rest of the bacteria.

Many of them are also very protective against, a number of chronic conditions. For example, how Comanche I'm using the is, keystone species that is protective against everything under the cardio metabolic syndrome.

Right. It's inversely correlated. So when you have elevated levels of Comanche or high good levels of Comanche, you're protected against things like diabetes, cardiovascular disease, obesity, polycystic ovarian syndrome, you know, Alzheimer's, dementia, all of these things that fall under that whole cardiometabolic syndrome spectrum.

When you have elevated levels of cycling back to approximate site, another keystone strain, it protects against all kinds of inflammatory conditions in the bowel, you know, inflammatory bowel disease.

So increasing those keystone species becomes really critical as a healthy part of the microbiome. And you can do that by increasing the diversity of the diet adding in extra polyphenols.

Many of these keystone species love polyphenols. They love resistant starches. They love fruits and tubers. They do really well with those kind of, resistant starch, high fiber type of carbohydrates.

And then, and then a little bit of fasting also improves their, their growth.

Diet, Diversity, and Microbiome Health

And then the simplest thing is staying away from processed foods and high sugar foods. Those things are very detrimental to the microbiome. Very very helpful.

So in the intermittent fasting generally 16 hours, no eating eight hours, eating something like that. Yeah. And the way I heard it, just a way to remember it.

Eat food that comes from the field, not the factory. Exactly right. Is that basically the way. And when you travel enough to work, when you talk about diversity, it's different fruits, different vegetables, different colors, different herbs, different spices, all of these different things that come from the field is really what's necessary for that diversity.

Absolutely. Yes. I'm curious, Karen, when you were saying that, it just triggered something in my head. You know, we teach a lot about heart rate variability.

And you know why that's so important in evaluating. You want to not make nervous system. Why it's the gold standard. Is the diversity of the gut affecting the variability of the heart?

Are those two interrelated? You know, I would I would hypothesize that they are. Because one of the things that a lack of diversity tends to do is it tends to create instability within the microbiome, which leads to instability in your metabolic process, which then leads to instability in your immune response to everything that your body is dealing with every single day.

Right. One of the keys to diversity is that stability is that ability to maintain a certain homeostatic, condition and variability in heart rate and response, really comes from all kinds of variability in metabolic process and immunological process.

Right. And since your microbiome accounts for 150 times more genetic material and more metabolic function, in large part it's probably driven by a dysfunctional microbiome.

So that's that's why that whole diversity component of the microbiome over and over again, over 10,000 research papers, shows and proves to be one of the most important factors within, within defining a healthy microbiome, you know, and if we can achieve that, if that's if that becomes our goal with the microbiome and we can achieve some degree of that, then we're really doing a great service to the rest of our body.

And then of, of course, our health and wellness outcomes. Beautiful. Well said, well said. So with all of that and that's just brilliant information or practical information.

What's the role of probiotics and prebiotics and what do we need to know about that. Yeah. You know, one of the really important things with all of these with probiotics, prebiotics, polyphenols, all of these things that can, hopefully impact the gut in a positive way is that they should be studied.

Right? Because when you take a whole bunch of bacteria and you throw it into your system, we can make a lot of presumptions about what may be going on with with the impact of the bacteria in your system, but you really have no idea unless you study it.

And that's where when when we started in the probiotic industry about ten years ago, that's where we saw a massive gap in what was happening, because there was a lot of presumption happening where you can put together formulas that seem to logically make sense, that they would be beneficial.

You could combine a whole bunch of different bacteria together at at some really high dose, with the assumption that when you put it in, it has a positive impact.

However, when you look at the complexities within the microbiome and all of the ecological forces in there, you really don't know what it's doing to the gut unless you study it.

So our role has been okay. Can we figure out microbes that rationally have a really positive impact on the microbiome and then do studies to verify that.

Right. So our whole goal has been can we find microbes that has a positive modulation on the microbiome. Because another way to think about it is if you're counting on a positive effect from the actual species that are going in as a probiotic, even if it's a high dose product.

Right? We're talking about a 5100 billion CFU product. You're sending it into a sea of over 40 trillion organisms, right? So it's a minuscule amount compared to what's actually living in this ocean in your gut. Right.

And so unless those probiotics have a way of impacting the rest of the microbiome ecology, their impact won't

really be realized. Right. So our focus was, okay.

Are there microbes that had relatively low doses can go in and actually have a significant impact on the rest of the microbiome, thereby having a profound impact on the body?

And that's where we focus in on things like the spore based probiotics, because they are environmental microbes that, we've been consuming inadvertently for, you know, millions of years through the course of human evolution and that that continuous exposure has created this really interesting symbiotic relationship with them, where we give them a home in the gut and then they kind of provide certain housekeeping functions for us.

So those kind of probiotics are really interesting. What we see when we add in the spores is they have the ability to survive, get into the gut. They do something called quorum sensing where they read the microbial environment.

They can find dysfunctional, potentially pathogenic organisms. They will sit next to them and actually bring down the growth of those organisms within the gut.

And at the same time, they increase the growth of the beneficial bacteria. So they make this profound shift within your microbiome that is then realized in many different ways.

One of the first things we studied was if we can shift the microbiome, a dysfunctional microbiome can we then resolve the issue of leaky gut? Because leaky gut is a consequence of a dysfunctional microbiome.

And the very first study we published in 2017 showed that that in 30 days, the kinds of shifts that the spores are able to make within the microbiome led to a sealing up of the gut.

And, and, and almost near a alleviation of leaky gut. And then all of the inflammatory processes that are associated with leaky gut. So that is the kind of profound impact that we really need out of out of probiotics, because ultimately, the biggest, you know, positive impact we're going to see is when we actually change the microbes that are in the gut.

So the probiotic can have an influence on that. Then it has a it has a really significant place in therapeutics. Prebiotics have that already built in because prebiotics are, food for bacteria.

So if you're selecting the right prebiotics, our favorite are things like oligosaccharides. Illegal saccades were really are first foods for our gut bacteria.

Because breast milk contains over 200 different types of illegal sac. Right. And so the the microbes in the gut, especially the beneficial microbes in the colon, are really well attuned to digesting and assimilating oligosaccharides.

So when you use oligosaccharide type prebiotics, you really can make an impact on that microbiome. So that's really the focus and key in my view. And when we do research on the microbiome, if those things probiotics, probiotics can impact the rest of the microbiome then they can be really powerful tools.

Beautiful. Now I take Microbiome Labs spore microbe probiotic. I think everybody watching there should be taking your spore probiotic. I think it's amazing.

How do people you know, I had never even, quite frankly, Karen heard of a spore probiotic until I heard you speak and learned about it and got in touch with your company even before we had ever met and ordered it.

And I'm very pleased that I did that. Why should people, you know, should they be taking this temporarily forever? How much should they be taking? Is it good for all people?

Is it good for all ages? The people watching this, I'm sure, want to know, because they're going to want to know how to get it. They want to know how to get in touch with you, but they also want to know how, what's the best way

to take this?

And is it for everyone?

Probiotics, Prebiotics, and Spore-Based Support

Yeah. So that's a really important question. Now when we first started developing it, that was a big question on our mind is that, number one, should you be taking a probiotic every day.

Right. Does that make sense especially from an evolutionary standpoint. Did our ancestors do that right. And if you take a probiotic every day, what is the long term impact on your microbiome and is there a diminishing return over time.

So we were we were looking at answering a lot of those questions. And part of the way we answer those questions, we look at evolutionary biology and we go, okay, we we honed in on the spores because we realized some very specific effects that they have in changing the gut microbiome.

And then the next question was, did our ancestors get exposure to the spores every single day? You know, did they inadvertently consume it every single day, like we might as a probiotic?

And sure enough, there are published studies that show the abundance and availability of these kind of spores are ubiquitous organisms in the outside environment.

And then there are glacial ice core studies that have verified that these same spores were very abundant in the Earth's environment 2 million years ago, 3 million years ago, half a million years ago, and so on.

So they were very ubiquitous in in Earth's environment throughout the course of human evolution, present in things like vegetation, in the soil, in rivers and streams, on fruits and, you know, of course, certainly in the dirt.

And so all of these things, led us to understand that our human ancestors got constant exposure to these spores. And then when you look at what they their life cycle is in the gut, they go in, they spend about 20, 21 days functioning in the gut, and then they go back out again.

So they actually, deliberately leave the gut after a period of time because there's a constant influx of spores in the natural state coming in. And then they use the human or the mammal, that they colonize as a vector to transport themselves throughout the, throughout the globe.

So when you look at glacier ice core studies in the Antarctic, in the, in the plateaus, in Tibet, in the, if you look at the South Pole, there spores in every corner of the earth, and they spread through being, hosted through mammals.

And so looking at that evolutionary significance, we said, okay, it makes total sense for us to get continuous exposure to these spores on a regular basis because they're part of our housekeeping function for our gut.

We've, in fact, outsourced a number of critical activities to the spores in maintaining gut health that we cannot do ourselves. One thing I'll mention is the amplification of pipe junction proteins.

You know, the proteins that keep the intestinal epithelial sealed, the the proteins in between the cells that keep it sealed nice and tight are 40 different proteins called caught in the chocolate and proteins.

There are 40 of them. They're the expression of those proteins are incredibly important to maintain the integrity of the gut barrier. We don't have an endogenous way of increasing the expression of those proteins when they get damaged.

These microbes, when they come into the gut, one of the things they do is they increase the expression of tight

junction proteins, thereby sealing back up the intestinal epithelium.

That's a basic housekeeping function of gut health that we don't have a mechanism of doing without the help of the spores. So I think over the course of time, what we've done because of our limited genetic capability, remember, humans only have about 22,000 functional gene.

That's about half of an earthworm. An earthworm has nearly 40,000 functional genes. So we don't have a lot of genetic material. And so a lot of these kind of critical functions we've outsourced to the microbial world around us.

And if we cease to get, constant exposure to these microbes, then we would cease to have those functionalities. And then our body goes into disease states.

Right. So, working through all of that rational looking at all of the papers and all that, we said it absolutely. People should be getting constant exposure to these spores.

This is something we should be taking every day. That doesn't seem to be an age difference. You look at the, gut of an infant. You look at a gut over 90 year old.

They have spores as commensal organisms. So it's, absolutely applicable at every age. And then, you know, in terms of when you should take it and all that, we always say take it with food.

Because most in most cases in the natural environment, you'd be getting exposure of these spores through the food that you're eating. They're teeming, you know, and all of the foods that, that our ancestors would have picked and foraged and gathered and eaten.

And so, it has a profound effect in the gut and it becomes kind of a daily foundational protection for the gut microbiome and the gut lining as well. It adds to the diversity of the gut, doesn't it?

Absolutely. Yeah. We've got a study, hopefully publishing sometime in the next six months. It shows that it actually dramatically increases the diversity within the microbiome because they're going in and they're playing orchestrator, orchestra.

You know, what is the head of the orchestra? I can't remember what what we call those people. But the guy with the stick, that's, conducting the orchestra.

The conductor, if you will. Yes. They are the microbiome conductors. And what they tend to do is when things are overgrown and imbalance, they bring down the overgrowth, and then they actually produce compounds like short chain fatty acids to increase the growth of the other underrepresented microbes within the microbiome.

So they are an amazing tool to bring about that diversity within the microbiome. Well, I think anybody watching and listening to this A is remarkably impressed with your knowledge and skill and understanding and communication skill.

But if you've watched through this interview, this conversation, you got to want to take the Mega Spore Pro biotic. It is just this is a must have product, I believe if you're looking to heal your gut, improving your gut brain axis, improve neurological health, create that gut diversity.

Karen. How can audience the audience listening and watching this? Find out more about your company, Microbiome Labs. Find out more about you know how to order your product.

How do they proceed? Yeah, and thank you so much for the opportunity to be able to share that. And let me make one, one more statement about, the, the use of the spores, you know, maybe many, many of the, doctors, practitioners listening are, chiropractic professionals who may be thinking about doing nutrition.

Right? Because to provide more of a holistic approach. And again, there's a lot to learn about nutrition and

microbiome science and how you can help your patients. Got.

One of the easiest ways to step into it is looking at a foundational probiotic like Mega Spore. You know, it becomes such a simple first step in adding in more of that holistic, nutritional, gut focus aspect to all of the other wonderful chiropractic work that you do.

And in fact, when we first launched the product back in 2013, our sole focus was in, was on chiropractors because my business partner is a chiropractor for the last 35 years, and he's a very functional, medicine focused, chiropractor, doing a lot of nutrition work with a big focus on the gut.

And we said, okay, you know, we're going to hone in on we and we did the Florida Chiropractic Association. So we honed in on them and said, we're going to teach as much as we can on how to incorporate microbiome science and understanding into the work that you already do.

And one of the simplest things is just having and, and, you know, providing this mega spore and the spore based products for, for your patients. So with that, you know, please come and visit us at Microbiome Labs.

Dot com. That's our website. There's lots of learning information on there. Webinars are posted. We've got lots of write ups, whitepapers and things. We've got access to research papers on there, including the research that we do.

And if you put my name in YouTube, you'll also find lots of, interviews that that people have very kindly uploaded that I've done with them, you know, hundreds and hundreds of, you know, interviews based with, with many different specifics.

We've got autoimmune ones, metabolic health, you know, aging all things, around the microbiome and how the microbiome impacts a lot of that. Those two areas itself.

And if you are a practitioner, you can set up an account with microbiome Labs. We only sell through health practitioners. We don't sell on Amazon and other retail outlets.

We we believe in protecting the functional medicine. And the health practitioner market. So if you're a health practitioner, you can come on Microbiome labs.com and sign up for a wholesale account to carry mega spawn the other products within your practice.

Beautiful beautiful care.

Using MegaSpore and Final Takeaways

And before we end this remarkable conversation, any parting words on your end? Yeah. You know, just a couple of things. There's two things that we have.

We we hold strong beliefs in, at Microbiome Labs. Number one is that functional, natural, integrative medicine is really the future of health care. Right?

This and now this clinical evidence that a paper published earlier this year showed that the integrative approach has a far better outcome than the standard allopathic approach.

So all of the practitioners that are watching this, you're playing a critical role in the future of health care of this, of this country. And then of course, the world.

Beyond that. And then our job as a company is to empower you with tools and knowledge so that you can do all the amazing things that you do. So, you know, we love the relationship that we have within the functional medicine world.

So, you know, I want to say thank you to all of those that have that have, taken up the mantle of going out there, being on the frontlines and helping people, at the office level one on one with with the people that really need, the support and help.

Number two, because your role is so important, it's really important that you're out there and you're talking about what you do, you know, that so critical.

So when you're out there, when you're online, you know, one of the things we always say in our marketing, in our storytelling is leading with your why.

You know, there's, you there is the why of what you do. There's the what and then there's the how. And a lot of times when practitioners are out there, they lead with, what they do and how they do it, rather than the why, that they do.

And keep in mind that when you look at the, the, the arc of persuasion, 65% of decisions are made by people based on the emotional, component of a message, the pathos, if you will.

Only 10% is made by the, the credibility portion, which is the, ethos. And then about 25% is made by the, logo. So the logic component. So what we tend to do in the functional medicine space, especially if you are credential health practitioner, is you lead with the credentials, you lead with the logic.

But that only accounts for about 25 to 35% of the decision making. You should lead with the emotion. Lead with your why why you got into this in the first place.

And that is how you'll capture more of these people, because the more people you guys capture, the healthier the world is going to be. So, that's just my little message.

And, we're always here as microbiome labs advancing the science, trying to provide you really awesome tools. And again, thank you for the opportunity to do this.

Well said. Beautifully said. You are a gem and a rock star in your world. And, everyone watching this, I'm sure if you just barely paid attention, you picked up tremendous amount of practical, implementable, concepts and ideas.

Please go to Microbiome labs.com, find out more. Get in touch with the company. Take those the mega spore probiotic yourself. Start using it in your clinic.

You will be very, very happy. Karen Krishnan, thank you so very much. This was an absolute delight. And what a pleasure to to affiliate with you and your company.

Thank you so much. Thank you.