Gut-Brain Axis Overview

the gut and the brain are two parts of the same system. They're not a different system at all that happened to be connected. If we think about the Gut and Brain as the Same system, it starts to put into better perspective how we have to address both the GUT and THE BRAIN.

is where when we do anything to the gut, we impact the brain. When we anything do to brain, impact a gut. And when there's a problem with the got for example, it can very likely be a brain issue.

and when the problem of the we know it is often a got issue, right? This is Dr. Talks. Welcome back. We are diving into another interview on reversing chronic gut conditions.

I'm your host, Sinclair Canale, and today I am joined by the wonderful Karin Krishnan, microbiologist and co-founder of Microbiome Labs. You are a beloved fixture in the community at this point for bringing your common sense wisdom and your deep research and ethics to this space.

It's no secret that we're in pandemic right now and it's worse than ever and yet we have more access to tools than never. So I really want to do a deep dive with you today and talk about what's working, what not working in the space right know and what a good use of people's time on their healing journey.

Welcome. Thank you so much for having me. This is a, you know, this kind of program is so critically important because knowledge is power in this, in your endeavor for your health.

And nobody's going to advocate for you health better than you are or, and certainly for own families better then you will. So knowledge it's so important in order to be able to do that.

We do live in a world. where we are inundated with information in every possible way. In fact, our phones are probably listening to us right now and probably curating our feeds and lists based on the things we're saying.

So we get a segmented curated list of information. A lot of it can be misdirection. It's important for people to know the right things. Yeah. I would love to start with why you're so passionate about this.

We've spoken about it a little bit in the past together, but I think it really bears mention here. What got you started on this journey? I've always been a nerdy science kid.

You know, I have always driven by curiosity. Curiosity of the world around me. And I needed to know how things work. why things went wrong when they would go wrong, right?

It was hard for me to take things just at face value or just on faith alone, I had to really understand the mechanics of things, whether it's in your body or around you or the microwave or your heart, whatever it may be.

I was always that kind of kid. And I always searched for answers that way. So that's one part of why I'm in the world that we're all in, because we live in a world right now and we practice in world where the problems are massive.

And they're extremely important because we're talking about people's lives and we are talking people quality of life and their families and all that. And the solutions can be quite elusive and the solution can difficult to ascertain because the problems are complex.

Right? And so it's the perfect place for someone like myself to put my effort, because if I can connect the dots to a certain degree, if can make sense of the variable information that's out there.

And if through all that, we can find a few solutions that improve one life, two lives, three lives let alone thousands of lives. Then the time is well spent.

Right. So for me, I always look at my time here on earth and in this universe and I have a deep appreciation for being here, right? When you consider that each one of us was a one in what, 300 million chance of being there because you know, the sperm that made me in the egg was one out of 300 millions that were on that journey, Right?

And then you think about how our molecules are made from stardust, right? We, we come from dying stars and supernovas that, that put out after nuclear fusion, they put this material into the cosmos that form life forms eventually.

Why This Work Matters

So you just think of all of those things and you go, holy shit, it's pretty special that I'm here. What can I do with my time? And we're not here for very long, right?

So it comes down to that. And that's how I think about the world and life and all that stuff. If I can help, I'm compelled to do so. That's why we do what we.

I love that. Thank you so much for sharing that piece. I think it really helps people know where we're coming from. You know, I frankly didn't think I'd make it to be this old, given the health challenges.

So I'm living on borrowed time and I am thrilled to make the most of it. Absolutely. And it pays it forward. Well, a portion of them will help others and so on.

And I think that's the legacy we leave, right? To me, it's not about your last name or what your tombstone looks like or whatever it may be people think of as legacy or your wealth and.

It's really about the wave of change that you can create, whether it is with a singular line of people or groups of. Whatever it maybe, there's somebody that is going to be living.

two generations from now, from when you and I are having this conversation, that's going to benefit from this information in one way or the other, right?

And for their sake, we need to do what we do. Yeah, I think that's beautifully said. Okay, so let's dive right in. I really wanted to talk about neurotransmitters and that gut brain access with a scientist.

Yeah. With a researcher because, and I want to today about, you know, what we can do to help support and shape our own microbiome, how we have so much more control than we think we do, on that plays into, our chronic gut conditions and how they came to pass and also how, they can be a part of the past and not the present.

So let's just dive in and talk about the enteric nervous system. If you could summarize that for folks, remember we got a mix in our audience of people just getting started working on their health, people who know more about their conditions than their doctors do, and then of course our wonderful practitioners on the high school tools.

Yeah, absolutely. So, you know, I think most people know the central nervous system, which is really centered around your brain and your spinal cord. And then you have something called the enteric nervous, system which, is basically a very, very dense neurological network that wraps itself around, your entire digestive tract.

Right? So and that nervous is directly connected with your central system mostly through the vagus nerve, Which is this nerve that connects the top and the bottom.

Which means that it's a bi-directional highway, which means the enteric nervous system, the gut neurological system is constantly in communication with the brain and the central nervous and vice versa.

Right? Now what's interesting about the Enteric Nervous System is it actually the second dense, most dense neurological endings in the body. It's much more dense than the spinal cord.

in terms of its nerve endings and so on, right, and neurological factors. So it's considered by many to be the second brain, if you will. Physiologically, it is definitely that when we talk about the density of nerve endings and the complexity of the neurological system.

But when you think about mechanical function between the gut and brain it really is not the 2nd brain. It is really the other brain because second would make it seem inferior in some way to our main brain, right?

But it's not actually inferior. In many ways, it is actually superior to the other brain in terms of some of the things it can do that the brain can't do, but in reality what they do is they work in concert with one another.

So when you think of a gut and a brain what's important to understand is the gut in the brains are two parts of same system. They're not a different system at all that had that happened to be connected.

If we think about the gut and the brain as the same system, it starts to put into better perspective how we have to address both the God and. Right. Cause we're, when we do anything to the guy, we impact the brand.

When we did anything that brain, impact a guy. And when there's a problem with the gut, for example, it can very likely be a brain issue. And, when it's the problem of the brain, we know it is often a gut issue, right?

Just a quick example of both of those things. IBS, Ibs Irritable Bowel Syndrome, which is this massive syndrome of diagnosis, a lot of SIBO and all kinds of things fit into it.

But IBS impacts like 60, 70 million people in the U. S. That's a huge chunk of the population, right? Have this massive issue of digestion. And I. B.s has always thought to be a gut issue because it's irritable bowel syndrome.

It's in bowels. Now the research is pretty clear that Ibs is a brain issue. it is actually a neurological issue that's centered around the relationship between the brain and the gut.

It's not something that's happening actually in the gut and driving it in, it's both a gut brain issue. It is that system issue, right? Same thing with anxiety, depression, we always thought of it as being a brain issues.

What's that? It largely a got issue that is impacting the brain. So the research is so clear on this now. And when we know this, this is how we actually go about helping these conditions is when understand what the true root causes are.

So that's a gut in the brain and the enteric nervous system. That's beautifully said.

Enteric Nervous System and IBS

Okay, so given all of that, where should we be focusing our energy and our efforts once a chronic gut condition has been created? Because it's that weird catch-22, right?

We need our gut to function well in order for the rest of our body to work well because we have to absorb our nutrients. If we can't absorb nutrients, we cannot heal.

So we get into this weird position where we're adding more and more things to the list to do every day and we are not seeing progress in our population.

Yeah, and it can get extremely complex, right? And especially if you go and you see many different types of practitioners, you might spend your first several years just talking to allopathic doctors and they're giving you very one-dimensional band-aid-like solutions and ideas.

And then you got to a functional doctor, but it depends on what they focus on. They may go, oh my God, You need to detox. focusing on detox for the next eight months, right?

Or you shift to another one and they go, it's not about detoxing, It's about rebuilding. And then they want to rebuild for, for next 8 months. So it can become very, very confusing.

Nonetheless, and then if you're looking for information about this stuff on online and all that, becomes mind-bogglingly. confusing. So let's break it down simply for people, right?

The very simple issue here is that nine out of 10 times, if you've got a chronic gut issue, it starts because there's a dysbiosis in your gut microbiome, what does that dysbiosis mean?

It's the general word that we use to describe an imbalance of microbes in the gut. But we can get a little bit more specific. What is actually out of balance in the gut, right?

Normally, it's the microbes that control certain features of the digestive system and also by that connection control features on the brain access. Right?

So the key things are these keystone species. So key stone species are acromansia, faecalum bacteria, bifidobacterium longum. These organisms are designed by nature and through the course of evolution with us, their role has become to defend and rebuild and restore the physiological structures of the lining of gut.

These structures are incredibly important for the basic functionality of your gut, for your body to be able to tolerate certain foods, break down nutrients, absorb them for you bowels to actually move, your enteric nervous system to have all the nutrients and byproducts it needs to function for right signals to go up to the brain so your brain can function appropriately.

All of these basic things, including of course, your entire immune response, which the vast majority of it is occurring in the gut, right? All those things are all dependent on a physiological structure within the guy.

And that is having these tight junctions in intestinal epithelium. That's a lining of your gut cells, they all have to be tight next to each other, like soldier cells sitting next each to other.

Above them, you have a really good robust mucosal layer. Right? You have to have, within that mucosal layer, you have a nice diversity of microbes. High diversity means a stability in your microbiota.

It means that not any one aggressive or egregious microbe can take over and start creating problems and inflammation in the system. it means there's balance, it mean that there are competitive forces, It mean there is a diversity in biochemistry and biochemical and biological activity in a gut.

And I'll describe why that in itself is important. And it also means that your gut is now functioning to support the body rather than acting as a highly toxic driver of the.

Right. One of things I want people to understand about their gut microbiomes and thereby their. Is your. Especially when you think about the brain, for example, right.

Your gut is either A, on this side of the spectrum, which means it's the most supportive, protective, important thing to your brain and the rest of your body, right?

Or on the other end of spectrum it is the more toxic thing, to the brain or the body. arguably the most toxic thing, even more toxic than your behaviors, you're more than smoking or, doing other things outside that we know are toxigenic.

A dysfunctional gut can become the mostly toxic things to your body. And so most people's gut are somewhere on that spectrum. Right? If you're all the way over here, which very few people are, the supportive nurturing

component of the gut to the brain, then you are doing wonderfully well.

Your risk for chronic disease is virtually none. You can eat anything you want. you sleep eight hours a night without any problem. Or if you do, you come off of it within minutes, right?

You're fit, your lean, all of that stuff. Everything is perfect in that case. Right. Now, as you moving down this spectrum. disease becomes more and more apparent.

When you get closer to this end, it means you have a compound number of chronic illnesses. You're dealing with autoimmunity, food sensitivities, allergies, skin issues, anxiety, sleep disorders, all of them compound on one another, right?

And that's because of the direction in which your gut is going. Gut health is merely about bringing your gut from here as close to this other end as we can.

Right. And there are certain principles that drive your got from this side to the side. And if we follow some of those principles, we can start making significant progress.

And we don't have to get overly complicated with 50 different supplements and variables and devices and all of that stuff. So that's where we really want to bring value to people.

How do you go from this side to this site? That's a simple breakdown of it. The first thing is what I mentioned is those keystone species. They have been designed to protect the gut, to move it from here to here, right?

Re-establish and maintain the lining of the got the intestinal epithelium, the tight junctions in between them and then the mucosal layer, and the immune response in the Mucosa layer as well, because that's another very important component.

So then how do you increase these key stone species? Number one, fasting can improve many of them. It can increase the growth of many keystone species.

This is why intermittent fasting, for example, has so many studies behind them showing all of these global health benefits just from not eating for a period of time.

And the reason for that is because many organisms like Acromansia, do really well under a condition where there isn't constant food coming in. It gives them an opportunity to do secondary tertiary metabolism that cannot occur when there's constant food coming into the system.

We're not designed to be constantly fed. Our ancestors did not have the luxury of eating 24 hours a day or even 16 hours at a, they had to make significant effort to go out and find food and they spent a lot of the day fasting.

And so our microbiomes are still in that state, right? We need to fast to a certain degree. And we're talking about a simple 14, 15 hour fast, mostly overnight, so sometime in the late evening, starting through overnight and then kind of push off that first meal a little bit, you know, towards nine o'clock or 10 o clock.

So you can get in somewhere around 14 hours is great. If you didn't do 16 hours, that's fantastic. But 12 to 14, there's still benefits there as well, right?

So that is one way in which you could help the keystone species. The second way is many of these key stone species are designed to consume complex oligosaccharides.

So oligo saccharide are prebiotic type fibers that are found in certain types of fruits and vegetables, they're found core part of the kiwi, for example, or in plantains or sweet potatoes or other types of roots and tubers.

And these oligosaccharides are very complex carbohydrate structures that only these organisms have the

enzymatic capability to break down. When they break-down these oligosacchanides, not only does that increase their numbers, it also causes them to produce very, very beneficial byproducts that are really important for the gut.

things like short-chain fatty acids, right? Butyrate, propionate, acetate. They will metabolize things, like polyphenols and convert them to urolithins, which are really important for cellular function and gut function.

Building a Healthier Microbiome

So a lot of the nutrients that we need to maintain a healthy gut microbiome and push the microbiomes from this end to that end of this spectrum are nutrients, that are byproducts of microbial fermentation.

We can't get them directly from food. they don't exist in food, We need our microbes to break down food and create these nutrients for us, right? So that's why that oligosaccharide and that prebiotic fermentation by the keystone species are so critically important.

It's not just about bringing their numbers up, it's because that metabolization creates byproducts that are incredibly important for our gut and overall health.

Right. So that's a second way of increasing those organisms fasting, increasing the intake of prebiotic fibers. And then, and then the third way is just to try to avoid antimicrobial compounds in your daily life as much as you can.

Right? We know one of the most egregious and pervasive antim microbial components is Roundup, right? It's, it's A, antibiotic. Uh, they were in the 1970s, uh, the company Monsanto that, that developed the product filed a patent for Rhonda or glyphosate being an antibiotic, right?

It kills microbes and, and it's sprayed everywhere. It's spread on everything, it sprayed on your, you know, your oats and all of those things. And so if you can reduce your exposure to those kinds of compounds, which do impact the keystone species, then you're doing a service to your key stone species by giving them the environment in which that they can thrive a little bit more.

Right. So just those three things alone. If we start doing those sweet things, alone, you can dramatically increase the growth of your keystone species.

Right? So that's one thing, one step one of moving your gut from here to here. The second part is increasing diversity. And we're talking about alpha diversity, which is the number of functioning organisms you have within your guy, right?

And a couple of simple ways of doing that. Fasting also increases diversity number two. Eating a diverse diet. Our ancestors ate upwards of 600 different types of foods annually.

They were foragers, gatherers, hunters. And they ate what was available. Humans are omnivores for the large part. We can eat almost anything. Insects, plants, animals, fruits, berries and everything.

Dig in the ground and eat roots and so on. So we can eat all kinds of things and we're designing to eat a large diversity of foods. That's part of what drove us up the evolutionary ladder and the end of the food chain.

Because you look down at the lower levels of food chains, you get a lot of obligate organisms, meaning obligated carnivores who can only eat meat. and their source of meat is gone because of a drought, then they're screwed, right?

And their sources of meet is often a obligate herbivore, which can only eat plants. And because that drought that herbiva was gone. It's not like the herbivo can start hunting all of sudden, it's like, the buffaloes are going to start chasing down wolves and hunting them down and eating meat, and so we are in a special situation where we can If the buffalo is gone, if meat is, gone if plants are gone.

We can eat insects, right? We're going to need crickets. So we can need worms, we're gonna need anything, and we, can survive on them. The diversity in our microbiome is in part dictated by the diversity of our diet.

And I understand that a lot of people watching this are probably like, well, I can only eat like six or seven foods, right? And, and I, can't tolerate a lotta things.

So how can I increase my diversity? Well, that probably means that you have to do other gut fixing things first, as you start increasing foods. And- and, uh, talk about- I could address that as well.

You're saying that. Let's just pause there for a second because we get so many students with chronic gut issues and they're being really hard on themselves.

I understand, I was down to three foods for long periods of time, like a couple of years. And they are stressed because they aren't eating the rainbow.

It's like, hey, first things first, we've got to work on absorption. We've gotta seal this gut lining. Get some drainage going. Yeah, totally. Yeah, so you have to address that, right?

And you may end up in or be in a situation where you can't diversify your diet just yet. And that's fine. Just know, and then the interesting thing about the microbiome is that it's an ecological problem.

So don't be stressed that your is low in diversity right now, because you don' have the capability of increasing diversity and that you're screwed because of that.

Right? It doesn't mean that at all. It means that a year from now we can add new foods. Great. Your microbiome will benefit from that a year from now, right?

And if two years from, now it takes you to add more foods, your microbiomes will still benefit, from it three years, it's an ecological problem. And so those organisms that are looking for the diversity of foods.

They're not necessarily dying off and leaving your gut forever. They're there, but they're at such low levels that they are really not functional. And so when you can and you start adding in more diversity of foods, you will bring them back.

That's a critical thing to keep in mind because people do feel the sense of hopelessness and loss. They are like, oh my God, I've taken 10 rounds of antibiotics in my life because of this condition or reason and my diet is really poor.

I'm totally screwed. You're not, it is an ecological problem. You can always improve it. It's never, never too late to improve your microbiome and move it from one end of the spectrum to the other, right?

If I was 95 years old, I would be, and I'd lived a normal, like allopathic life of just taking medicines and all that, i would start working on my microbiomes today because it's Never too Late.

And it's never too late to see the improvements and the subsequent benefits of it. So diversifying your thing can come from just fasting, right? So if you can't tolerate foods, great, you fast.

You cannot eat anything, that in itself can help. Number two is if can tolerate food, then you want to start looking at how How do I get some of the base nutrition into my microbiome to feed those organisms?

You want to start looking for a really good mineral balance, a mineral product that has a good diversity of earth minerals. You wanna look at really natural multivitamins.

There's a lot of good ones on the market nowadays that are drinks, but you wanna make sure that the vitamin sources are all natural. A lot of them come from greens and things like that, right?

So you can do some micronutrient supplementation in order to help give your microbiome some of the benefits that it needs without being able to extract it from food, because you just can't introduce that many foods into your system at a time.

So you want to feed base nutrition to your microbiome. You want a fast. Um, you also want it just eat whatever you can, as much as you, can as, and you try to add things in slowly one at a time.

But you could also go outside. As it turns out, being out in nature, spending time in natural environments, like going for a hike. And, you know, sitting down and let's say you can just, bananas are one thing you eat, right?

And your system tolerates bananas. Great. Take a couple bananas with you on a hike, sit down somewhere in the natural environment on the log or something like that, peel the banana and eat it there in that environment, that is one of the most natural ways of introducing microbes into your systems.

They seem esoteric because you're not seeing microbes. You're rolling around in the dirt and eating dirt. But believe me, you are getting exposure to microbes just by being in that environment.

And especially if you were consuming in an environment, right? One of the things I do and I make sure my kids do, for example, we love going out in nature and hikes and all that.

I made sure they're touching things. You know, like I'm picking up sticks and handing it to them and going, look at this stick. Look at the log. Hey, catch this rock, you know?

Like I want them to touch things in the environment because that's how we engage with nature. And that how pick up all of these microbes, right? And then I'll toss them an apple and have them eat it, Right?

Now they're touching the apple. It's got microbes all over it from the trees and the bushes and all that that they were touching. and you're putting that into your system.

Now it doesn't necessarily mean that those microbes are going to colonize your gut. But it does mean that those microbes are going to facilitate reactions in your gut that actually help diversify some of the microbes that do exist in you gut microbiome.

So that engagement with nature in itself can be very, very powerful. You may not be able to add 10 new foods to your diet, but you can absolutely fast.

with a good diversified mineral, vitamin, micronutrient mix, so they have all the components they need to engage in their metabolic activity, you can absolutely go outside as well.

You can be in the environment, engage with nature, consume whatever it is you're able to consume in nature so that you get more exposure to microbes. And you could be prescriptive about that.

If your gut is really messed up, prescribe yourself three or four times a week, 30 to 60 minutes a day being outside in a natural environment. Take your shoes off, put your feet in dirt a little bit, and then put you socks and shoes back on or whatever you're wearing, come home and walk around your home with the feet that have been in the dirt.

Because that's how you are enriching your microbial environment in your whole. You can actually keep your doors and windows open if it's safe where you are to do that for a few hours of the day to allow more microbes into your household and improve the microbiome of your households.

And again, all this kind of sounds a little fluffy and esoteric, but there's research on this that shows that this type of stuff actually does improve your health as it is improving the microbial environment around you.

I want to really emphasize that this is like brass tacks stuff. I think that the sicker we are, the more we tend to reach

for the most sophisticated sounding thing, which actually might be the outside of nature.

You do not need to go get $10,000 or $20, 000 worth of stem cell injections. We need you to get outside. Stop eating food that hurts you and start from there.

Leaky Gut and Chronic Disease

Absolutely. Yeah. And then, okay, so we talked about keystone species, increasing them. We talked trying to increase diversity as another thing. The third thing is you have to stop the leakiness in the gut, right?

Leaky gut is the biggest driver of chronic gut issues and then chronic health issues in general. I do a whole lecture for doctors. where I take them through for two and a half plus hours on showing them how all of these seemingly unrelated conditions like reflux disease with diabetes and anxiety and autoimmune conditions and heart disease, all these things are thought of to impact different parts of the body and are seemingly unrelated.

How all those actually have the same exact cause. in the gut and it's the leakiness in a condition called endotoxemia and that's when your gut is leaky and you leak through all of these endo toxins that are produced in microbiome in your guts.

The presence of those endotoxins not only in you gut lining but then throughout your body is the biggest driver of chronic low grade inflammation and in fact a 2015 study in frontiers of immunology concluded that this process of your gut being leaky and these endotoxins leaking through is a number one driver of mortality and morbidity worldwide.

Right. It's a Number one cause of death worldwide and the reason is because it is the driver, the key driver. Of the top five killers in the modern world, right?

Heart disease. diabetes, cancer, osteoporosis, and then now neurodegenerative conditions as well are hitting that top list. Things like Alzheimer's, Parkinson's dementia and so on.

All of those conditions are driven by this leakiness in the gut. So you do have to do some things to address that. That's been kind of the mission of Microbiome Labs, right?

When we first were conceptualizing, you know, a microbiome company and the big problems we wanted to solve in health, it became very clear and easy to figure out that leaky gut was a key thing we needed to resolve.

So we started looking at in nature, you know, how are animals engaging with microbes and all that? What does leaky gut look like in the natural environment?

Are there any other segments where leky gut has been tested and actually successfully treated? And as it turns out in veterinary medicine, they've been successfully treating lekey gut for 50 years.

Right. Identified that leaky gut is a big issue in veterinary medicine because there's a massive economic impact in veterinarian medicine with leakey gut and that's in farms.

Right? So in meat production facilities, I know they're not the greatest example of anything healthy, but But the benefit of the work that they've done is actually going to impact us in a very positive way.

This has been going on since the 1950s and 60s. What they found is that when you have a lot of pigs together in in pig farm, a cow operation or chicken operation, you get a certain level of mortality rate in these animals, right?

And for these companies, if you're at three, four, five percent mortality rates, it's a massive economic impact because a chicken company might have a billion chickens.

right, among their four or five different production plants. And so, and grow houses and so on. So if they have a

billion chickens and 3% of them die, that's a huge economic impact.

They've been spending a lot of money in veterinary medicine to figure out what is making these animals sick. Sure, the conditions they're in are absolutely horrific for the most part, right?

But what it is about the condition and what's happening physiologically in the animals that are making them sick? They've identified that intestinal permeability that is caused by antibiotic use and poor feeding conditions and poorer environments and all that, is the biggest driver of mortality in these animals.

Also what causes their immune system to be suppressed and be more susceptible to illnesses and not gain weight appropriately and to not be able to utilize the food that's called feed utilization, right?

That's a metric that they measure all the time. one pound of feed, how many pounds of weight do we gain on these animals? And that's directly associated with how leaky that animal's gut is.

And so their ability, the animal to assimilate and utilize the food and nutrients. This is all the same stuff we experience. Yes, we're not animals being grown in a grow house for slaughter, but we consume a lot of antibiotics.

Sure about that. Right. Actually, yes, I guess we can't be completely sure about that, but we are, we consume a lot of antibiotics. We're surrounded by all kinds of horrific chemicals that hurt our microbiome all the time.

Right? We have very poor food choices, you know, just as terrible as a feed is that they're feeding these animals. we have really low quality, cheap food.

for the most part, right? Low nutrient density, highly processed, you know, so we're so much similar to those animals and we suffer from leaky gut as well.

And then the things that kill us are typically things driven by leakey gut. So in that world of veterinary medicine, they did a bunch of studies on types of probiotics that can actually alleviate leaky gut in these animals and dramatically reduce mortality rates and improve the health of the animals.

And that's where we got a lot of our signals from. So we started looking at the types. Of microbes that they identified and how those microbes stop leakiness in the gut of these despite the horrific conditions.

of the animal. And we took cues from that to identify similar organisms in humans that could perhaps do that as well. So that's how we founded the company and we've built a solution around leaky gut with the spore-based probiotics.

We have a system called the total gut restoration and the focus of that is on alleviating leakiness in the gut. If we can do, that then that a huge step forward in overall health.

So chronic gut conditions, chronic brain conditions chronic health conditions can be dramatically helped by improving keystone species, improving diversity and stopping leaky gut.

If you do just those three things, you're really making a massive shift towards this other side of the spectrum. Yeah, I think that's really beautifully said.

So let's wrap all this together then. When we look at reversing chronic gut conditions that have developed over a long period of time, and the gut-brain axis has been established, it's understood.

We're sending, what is it, 10 times more signals to the brain from the guts than are returned. So, and this is like where the good stuff is. This is where improvement can happen is going right to the gut and working on it with depth and with care.

And that does not mean dumping in like the maximum number of species, right? Let's pause for a tangent here

because more does equal better, Not in any way.

In fact, when it comes to probiotics, more often than not more is worse. And this is something we've been researching, right? And we work a lot with big research organizations around the microbiome.

There's this concept of whether or not your probiotic are silent or they're loud. What that means is we're talking about from the perspective of the immune system.

Right? Keep in mind that the vast majority of probiotic bacteria you have access to when you buy, you know, the products on the stores and all over online aren't native to your gut, right?

Which means that your immune system is going to have some sort of response to them. And what we're finding is that, that vast of majority strains we are testing that are used as probiotics actually amplify inflammatory responses in your guts and systemically.

Right. And the reason for that is because here comes this 10, 20, 30 billion microbes into your system that aren't native to your. It's perfectly normal for your immune system to go, holy crap, what's all this?

And ramp up its activity. Right? The innate part of the immune, which is the first responders are going to do that through inflammation. They escalate inflammatory responses.

Now, that can be beneficial if you are a healthy person already, who's looking to just stimulate your immune system, right? Because that just kind of gets your system fired up and gets the inflammation and the monitoring cells and all that moving around.

But if your sick, if, you're already inflamed, If you have any condition that's associated with chronic low grade inflammation, the last thing you want to do is actually increase your inflammation.

Right? So it's a very small percentage of people that will actually benefit from the conventional type of probiotics that tend to amplify inflammatory responses.

Probiotics, Research, and Practical Takeaways

That's why when we develop probiotic strains, we're very careful in identifying strains that don't do that, that do not amplify the immune response and instead modulate and bring down the inflammatory component of the response.

We have the studies to do it and it requires a lot of complex microbiology and immunology to figure that out. And the vast majority of probiotic and supplement companies in the marketplace have no capability of doing that, right?

They're just buying whatever species they can buy on open markets, you know, from China and overseas and all that. They just throwing them together, putting it in capsules going, oh my God, this is 15 strains, 50 billion CFUs.

So this amazing probiotics, highly potent and blah, blah blah. All these statements and putting out there. Right. When for the most part, what those strains are doing is amplifying inflammation in your body.

Well, and at best it arrives dead. Right? Processing storage and delivery. And at worst it actually works and it's totally inflammatory. Totally. That's the unfortunate thing about our market, and this is where the right information, mid-busting, a focus on science is really important, right?

We've been a company now for nine years. In that nine year, we've published, I think, 16 studies. Right. They're the most of the companies in our space have been around for five times as long, you know, three times long and have never published a single piece of scientific literature.

Right? And that's just mind boggling to me because to be, we're in the business of science and we need to make discoveries. We need understand what our products are doing.

And we have to figure out if they're helping people or they are not helping. And if they are helping people, how are they helping? And the only way you can do that is by investing in science and research and knowing what you're doing.

And so it is unfortunate that the majority of things that people have access to in the supplement world are nonsense and in some cases can be harm than good.

But the good news is there are some companies doing the right things, right? And we've tried to set that bar for people. And then there're companies that are also doing research and following suit.

So there's hope out there, but people have to listen to programs like this and listen the nerds like myself talk and follow the literature and research, so they can figure out where the things are.

I ask you this then, because I know we have some fans of yours in the audience today. They heard a lot of your talks. And speaking about these studies regarding microbiome modulation and different probiotic strains and their effects on the gut-brain axis, I would love to know if there's any nuggets that you feel are relevant to share based on what we covered today that we don't normally get a chance to show that would really help our audience in reversing chronic gut conditions.

So the one I just mentioned, whether your probiotic is loud or silent, right? That's one, I haven't really talked about because I, just got an update on a lot of that research work just two weeks ago when I was in Ireland meeting with a bunch of the researchers at the APC.

So that's completely new information. So we have in our ZenBiome product, which is our gut brain product. That's a product that modulates cortisol response, anxiety, improves sleep.

So it modulate brainwave activity as well. It has this coating around it called the exopolysaccharide. And that's what makes it really, really unique.

They tested that bifidobacterium longum and then they tested about 12 other biferobactorium probiotic strains. Bifido is very popular in almost every probiotic product, right?

And they found that all the other bifidobacteria all increased inflammation at varying degrees. Some of them really high, and others a little bit lower and throughout there's a whole spectrum of the level of inflammation that they cause.

The exopolysaccharide one doesn't. Right. And that's the exopolysaccharide actually prevents that increase in inflammation. So that a little nugget for people that I don't want them to be tempted by going, oh, I saw this probiotic on Instagram and this ad, you know, and it's got 50 billion cells and I have a gut issue, which means I need a probiotics for it.

And then they just start taking a probiotic, right? They're not at all created equal. Every probiotics is completely different from one another. It's strain specific.

And you really have to know if the company that has put the probiotica out in the market has done any studies on that finished product to see how does it impact your microbiome?

How does impact you immune system? how this impact the leakiness in your gut? Is it positive or negative? Right? Cause it can absolutely be negative. And that's the part that people just don't understand or appreciate.

You think a probiotic is a probiotic, I'm just going to take one, you know, but that is just not the case, right? So the right probiotics can be one of the most powerful things you do, because microbes can influence microbes better than we can.

But you have to have the right probiotic, right? But, you also cannot negate all those other little behaviors, the little

changes, being outside more, modulating your stress by doing some mindfulness work, by trying to increase the diversity of your diet, getting some exercise, and getting adequate sleep.

All those things sound very generic. But all of those things actually have a very positive impact on your microbiome. And when you add them all together, it becomes a powerful solution, right?

Anyone by themselves is not necessarily going to move the needle. But when add a bunch of these behaviors together it really does make an improvement.

Thank you for saying that because to us, the way we teach this to both our clients, our students, and our practitioners that we mentor, we're always talking about the stack.

Each player has to support the other choice, other input. Like this is not done in isolation. So I think it's so funny when people are like, well, but Megasport didn't fix all my problems.

It's like well what was the stock you put it in? Because it was a phenomenal product. You did it wrong is the point usually. Yeah. Yeah, absolutely. It's no different.

And many of you use an analogy, right? It is not enough to have your car functioning just by putting gas in it. You have oil in there, you have to take care of this, and you take of that.

There are so many components to make that machine work properly. Our body is a complex machine and there are just so much components. So many inputs and so may outputs.

And so we have to make sure both our inputs and outputs are balanced properly, then some of these tools will actually have really profound impact. And I think the real important message here is that there is hope.

Because that 2015 publication in Frontiers of Immunology, the one I said that, you know, shows that leakiness in the gut and a dysfunctional gut is the biggest driver of mortality and morbidity worldwide, right?

Good news in that. Is that they're talking about the gut and the microbiome, which can be modulated, you know, and thereby the biggest driver of mortality and morbidity today is something that we can actually change.

Right? It's not our genetics, right? We can't change our genes. If we all had like just shitty gene snips and mutations all over the place and that gave us cancers and heart disease and dementia and allergies and all that stuff.

We'd be screwed because we're like, we can change your genes, but we absolutely change ecosystem. We can do that. A lot of what we talked about today will make a huge change to your ecosystem moving forward.

So know that there's hope, and that's a really, really important aspect because you may be watching this and you're down to three or four foods and, you don't sleep well, your anxious, You've got a skin rash that that has been bothering you for like a year now.

Right? And, and just, you're struggling with weight and lots of different things are all compounding on top of one another. And you can't figure out what to deal with first.

Right. Do I deal my gut issue first, my skin issue, first my weight? What do I do? Well, just know that if you start working on the fundamentals and the foundation, that spectrum that I talked about, right?

Where if your on this end, it means your microbiome is damaging all things in your body and you move it to this and it starts helping all thing in you body.

All of the things that you're dealing with will be improved by just slowly moving your microbiome back this way, right? And so you don't have to necessarily think about is it the eczema I go after first or is the hair that's becoming

thinner or my extra weight on my waist or whatever the condition is.

Do the fundamental. And when you do the fundamentals, you'll start making improvements in all of those things, they're all connected. That's so beautifully said and what a great way to end together.

I remember doing my DNA reports with a specialist who was like, oh yeah, look at all these problematic genes and essentially his assessment of me was that I would never get well.

And I'm happy to say that nothing could be further from the truth, right? From my own lived experience, from your body work, for mine, you know, if we start with the microbiome, we started with gut, with aloe fruit, so much becomes possible.

Yeah, totally. Yeah, thank you so much for your time today for sharing your wisdom, for publishing all those great studies. And I know that people can find you at microbiome labs.

There's amazing protocol info there. Awesome products that we incorporate into all of our work. So thank so you much your contribution. It's just great talking to you as usual.

Thank you for having me. I appreciate it. Thank you for tuning in to Doctor Talks. We hope today's episode has enlightened and inspired you on your path to optimal health.

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