Introduction and Dr. Rawlsu2019 Lyme journey

Welcome to another episode of the Healing Lyme Summit. I'm Dr. Myriah Hinchey, and tonight I have the pleasure of talking with Dr. Bill Rawls about how Lyme and tick borne diseases affect our microbiome and gut health.

Welcome, Dr. Rawls. Oh, thank you too. Pleasure. Great to have you here. please introduce yourself and tell us a little bit about how you fell into treating chronic tick borne diseases.

Yeah, fell and is right on spot. it's, I don't think most people choose that. It chooses them. And, I was trained conventionally. I chose to practice obstetrics and gynecology because it dealt more with wellness and bringing life into the world.

It was really wonderful. But it came with this obligation of covering hospital labor and delivery and emergency room, and then a small town that was every second to third night.

And, so I spent 20 years of my life mostly sleep deprived, because when you have that kind of call obligation that keeps you up most nights when you're on call and then trying to balance out with being active and community and being a good dad and husband, you know, it's just those things get shortened along with all your other health habits.

And by age 47, I crashed. but just stopping obstetrics and research and taking more time to sleep didn't fix me. I had just a range of symptoms cardiac symptoms, gut symptoms, brain symptoms, joint symptoms.

My whole body was falling apart. The fentanyl specialist I saw really couldn't explain it. The most they could give me was a diagnosis of fibromyalgia, which really doesn't get you anything but treatment of symptoms. And, I just kept thinking, you know, it's gotta be something else and kept pushing until I finally found.

And I was carrying, the Lyme microbe Borrelia. And then I thought, you know, this is I can take antibiotics, I can get well, I'll be back on my feet, but, I didn't have acute symptoms.

I had chronic symptoms. And I've come to appreciate that what we define as chronic Lyme disease is very, very different than acute Lyme disease. And it doesn't respond well to the types of antibiotics we.

I was in a situation where I really couldn't travel to pursue care and ended up, using herbal therapy and got my life back. not just like a little bottle of herbs off the shelf at the grocery store.

I was ordering specialized botanical extracts and taking just handfuls of of herbs and, gradually got my life back. And over a five year period, a big learning experience, all my symptoms gradually melted away.

And I've been well ever since. and my life's pursuit since that time has been really understanding why your work and what this thing is that we call chronic Lyme disease.

Yeah. Thank you for sharing your story.

Understanding the microbiome beyond the gut

and thank God you got better, because I know you are helping thousands and thousands of people recover in the same way that you did. Well, like so many others like you, you know, we give back and, you know, that's you take what you learned and you try to make it available to anyone else that might be able to benefit.

Yeah. And that's the whole point of what we're trying to do here. So thank you. all right. So let's start let's talk about

what impacts Lyme disease has on our, gut health and microbiome.

Yeah. Well, when we say that word microbiome, a lot of people immediately think about the gut. But, microbiome is basically all the microbes that inhabit your body or a part of your body, and we have to respect that.

You know, our gut is walled off from all the rest of our tissues. The the gut lining keeps the food and my microbes contained. So they're active in there, but they're often active independently of us.

Our skin microbiome. So we have different microbiomes in the body. We have our gut microbiome, skin microbiome, the microbiome of our sinuses and nasal passages.

you know, and, and, and all of these microbes are different. I mean, there's even evidence that the microbes you have in your left arm pattern are different than the microbes you have in your right armpit, which is really interesting.

But all of these things are outside of our tissues. And what my interest has been is what is being defined is the tissue and blood microbiome that we actually have microbes that slip across these barriers, across the gut, across the skin, across the sinuses, enter the bloodstream along with all the other foreign things we pick up, like tickborne microbes and respiratory infections, anything that makes it to the bloodstream.

And this is constantly happening, and it turns out that our bloodstream for microbes is more like a freeway than this sterile, calm place. Microbes are constantly coming and going.

And of course, the immune system has to manage all of that. But some of those things slip by and end up in our tissues. Our brain, our heart, our joints everywhere.

And it's not just one microbe. It's you know, what they're finding is that we have microbes throughout our body. If we are healthy, if our cells are healthy, then these things can stay dormant and they can stay dormant for a lifetime.

It's only when they react, become reactivated that we have symptoms. So the gut microbiome is feeding that and other parts of the other microbiome in the body are feeding that.

So all of that is relevant in that way. And how does getting a tick borne disease infection sort of break that balance. And, and push someone into a situation where they no longer have healthy cells and the cells can no longer protect themselves from all of these different microbes?

Yeah. often it doesn't at all. Okay. You know, when you look at all of the tick borne microbes, whether you're talking about Borrelia, Bartonella, all of the things that you hear about, they are all low grade pathogens.

And a lot of people really raise their eyebrows and are surprised to hear me say that. But how do you define as a pathogen? Is the ability of that bacteria virus, whatever to cause severe acute illness?

So Ebola is a severe pathogen. That's a high grade pathogen. Smallpox. That's a high grade pathogen. so when you look at everything out there, SARS virus, that's a medium to low grade pathogen.

so the the mortality associated with Ebola, about 60% smallpox, even higher than that.

How tick-borne infections reactivate and spread

Covid about 1%, about 1%. So killed a lot of people because it infected so many people all at one time. But the actual mortality was 1% or less tick borne microbes.

Pretty close to zero tick borne microbes do not kill people acutely. The chronic manifestations may kill people, but they don't kill people acutely. They wind by stealth.

So there might. Their motive is not to make you severely ill. Their motive is to have a place in your body to hang out and wait for another host. They don't have to make you sick to do that.

very interestingly, when I was researching my book on, like, in Lyme, I came upon the evidence that, a, a, a person, a human thawed out of a glacier in the Italian Alps that was 5300 years old, mid to late 40s, had some arthritis, wasn't in perfect health this guy was crossing the Alps.

He had Borrelia, Lyme like, in his tissues. This guy was crossing in the Alps. And. And that just shows what happens with in a lot of cases that these things can enter the body.

And, you know, they do it very stealthily. They bypass the, the, the, the immune system, you know, at, you in system mopped up a lot of the microbes. But if you get through and if they can and her tissues and enter cells, they can become dormant inside cells and just kind of hang out and wait.

And, when our health is compromised in other ways, that's when we become sick. that's when these things reactivate. But it's typically not just Borelli and not just Bartonella.

It's Epstein-Barr virus and all the things that we know to measure. And ten times over that, maybe even 100 times over that. So we do have these microbes that, you know, that science is showing more and more.

We have these things that are dormant in our tissues. Tickborne microbes can become dormant on our tissues. And it's not until we do that other things happen.

I've interviewed thousands of people over the past decade and 95% of the people that I talked to do not remember becoming ill around the time of the tick bite.

Yeah. I use the analogy a lot of times with my patients where it's like, you know, it's the straws in the back of the camel, right? And the camel is the immune system.

And it's like, you know, there's finally just too much of an overload. And that's when you have this huge change. Yeah. Yeah, absolutely. And so it's other factors, you know, years of a bad diet, sometimes a perfect storm of stress factors of mental stress.

You know, my my wife left me my office, my I got fired from my job and my house burned down. And that happened all at once. Or I had a bad automobile accident and ended up in the hospital recovering for 2 or 3 months.

Those kinds of stresses seem to precipitate reactivation of these microbes. And then you know what the microbes are doing when they reactivate this. They want to create a food supply.

So they start breaking down, you know, the things that you talk about, they use enzymes and and inflammatory cytokines from the immune systems break down our tissues, our cells, and to create a for a food source to grow more microbes.

And when that starts happening, it's like a pot boiling over that just feeds itself. and that can affect everything in the body, including that gut microbiome and everything else.

Yeah, absolutely. And then, you know, there's a lot of things when you're trying to treat these infections that can cause further disruption of the microbiome all over the body.

would you like to comment on that a little bit? Well, you know, there's that delicate balance, of the gut that is so important. everybody talks about the immune system, but we actually have four levels of defense, and it's really important to recognize all four.

So the first level of defense is barriers, the gut lining the skin, the lining of our sinuses. And what those things are designed to do is keep microbes out of our tissues.

But those barriers are leaky. Things are constantly making their way across these barriers and getting to our bloodstream. So our backup system and it's really most important for acute infections are ours is our immune system that's managing these these things that are sometimes a trickle, sometimes a flood of of not only things that are part of us from our gut and our skin and our sinuses, but also respiratory infections and tickborne microbes and everything else.

So our immune system is is the backup plan. so that's a second level of defense. Our third level of defense is ourselves. A lot of people don't appreciate that.

Our cells, brain cells, heart tells all the cells in our body have the ability to expel or destroy microbes.

Why antibiotics can disrupt the microbiome

and they use a process that it's called autophagy that the cell uses to rebuild itself. Well, it's also how it gets rid of microbes so our cells can defend themselves.

But all microbes. And this is a really fascinating thing to study. All microbes are finding have the ability to become dormant. If conditions aren't favorable for the microbe to grow.

Then it just goes into a acquire dormant state and it can stay like that indefinitely. If you look at, all the microbe mass of all microbes on Earth, 60% of them are dormant in any given time.

So so that dormancy is a key thing that microbes use. And you have to think about it, that, you know, a bacteria is like 100 to 1000 times smaller than one of our cells, and a virus is a whole lot smaller than that.

So you can have a bunch of microbes, a bunch of bacteria inside your cells. But if they're dormant, cell just keeps right on working. so so that fourth level, the third level is our cell cellular defense.

And then the fourth is our normal flora. So we have bacteria in our gut on our skin. Other places in the body that protect us from pathogens. So we all have these opportunities that are there just waiting to digest us to cross into our bloodstream.

Everything else, and our normal flora, keep them in check by secreting substances that suppress growth of these these other microbes. they don't do it for us.

They do it because they want all the food to themselves, in the gut or on the skin or anywhere else. so they're suppressing their competition and just works well for us.

We've had this long standing relationship with them, and it's kind of like, okay, yeah, we're going to let you hang out there because you're doing us a favor.

And so our immune system doesn't attack them. so it's a it's a really interesting balance, but they're easily disrupted. Antibiotics, stress. There's so many factors that can disrupt that gut microbiome.

And once you do that, you lose that to fat. So an interesting study that I came upon, this was study in 2015. Is that they found that we do have a trickle of microbes of bacteria, pathogens and normal flora to that flow across the gut there into the blood stream.

And this is happening all the time to everybody. When you have dysbiosis, when you disrupt the balance of normal flora for versus pathogens in the gut.

That trickle becomes a flood of pathogens. So that's one way that, you know, that that treatment of Lyme disease, if you're not careful, can actually disrupt the gut.

And, and aggravate your situation because then not only if you got reactivation of the Lyme microbes and all the

other things that you've got picked up in your tissues, you got this flood of pathogens coming in from the gut and layering on top of that.

So yeah, you have to be really careful about not disrupting that, that gut balance or the gut scan. Any, you know, these microbiomes that exist outside of our tissues, right.

So it's a really delicate balance because it's a double edged sword. Right. How do you get rid of an infection without using means that disrupt the microbiome, and not only the microbiome and the normal flora?

That helps to protect us, as you just explained, but also that can exacerbate the break down of the tight junctions, for example, in the gut, and then allow all of these toxins and pathogens to actually enter into systemic circulation, you know, causing more toxicity, oxidative stress, etc..

And it just seems like a vicious cycle that starts feeding itself. Yeah. It does. and yeah, that's why you have to be really careful about, using antibiotics.

and I, you know, I, I, I think there is a place for antibiotics and Lyme therapy, but I think it has to be really used very judiciously. you know, when, when we get right down to it, antibiotics do a what they're designed for are to kill fast growing pathogens, things that are growing really fast.

So if somebody gets an acute pneumococcal pneumonia, those bacteria are invading the lung tissue and they're growing very fast. They they're doubling time is roughly about 15 or 20 minutes.

So they're moving. And antibiotics depend on that fast growth to kill those bacteria selectively. It's not that they like to, you know, that we can target pneumococcal bacteria.

What we're targeting with an antibiotic is fast growing bacteria. All right. So and they're growing a lot faster than normal flora. But still you know with prolonged use of an antibiotic you're going to start killing your normal flora to they're kind of medium growth.

They're not turning over as rapidly. So let's look at what's the doubling time of Borrelia, the Lyme microbe 12 to 24 hours 12 to 24 hours. And then if it's growing inside a cell, you're not going to get it at all.

So that presents a real problem with using antibiotics, because to kill those bacteria, you're going to have to use those that those antibiotics for months on end.

Whatever therapy you're going to have to do, you're going to have to do it for months on end to get rid of that bacteria. And you always run into the problem two to basic problem two, you're going to disrupt normal flora, but you're allowing pathogens to flourish in the gut, and you're going to create antibiotic resistance in those pathogens in the gut.

And so you kind of get a double whammy. And that limits the use of antibiotics. I think what everybody focuses on when they when they're trying to solve the problem of Lyme disease is how do I kill the microbe that's making me sick?

Herbal therapy as a broader healing strategy

How do I kill that bacteria that's making me sick? I have to find the bacteria and kill that bacteria so I can get well. And the first thing they turn to is what they know, which is antibiotics.

But it's not a good choice. It doesn't. It's not a solution that fits the problem. So first of all, there's always a lot more there than we can test for.

When you look at this bigger issue of microbiome. And second, they're all growing really, really slowly. So one thing that I like to emphasize is it's not about the microbes.

It's about restoring the ability of the body to contain the microbes. And part of that is suppressing this overgrowth of bacteria and other microbes that are reactivating in your system that that thing that's shifting your body toward breaking down your tissues to create an environment that favors microbe growth.

But you have to restore the ability of the body to contain that thing. And that's really important. Yeah, I think that's a vital point in all of this.

how would you tackle this? How do you tackle this? Well, that's that's a real beauty of. So back to what I was saying, that, you know, our goal is to restore the ability of the body to take care of itself and keep those microbes contained, the ones in our tissues that are being reactivated, not just tick-borne microbes, but everything else, you know?

I mean, think of all the people that are tested, and they find Epstein-Barr virus and Mycoplasma and communities and all these other bacteria. They don't get those ticks, they pick those up.

It's kids. They've been dormant in their tissues, just like the tick borne microbes. And they become reactive when everything else does. But it's well beyond our ability to test.

I mean, it's in this the spectrum of it is really pretty mind boggling. So how do we go about doing that? And it's, part of it is suppressing the microbes.

But how do you do that without disrupting the gut flora and what's going on in the gut and really making a mess there because, you know, so many people already have compromised gut function just from the stress of chronic Lyme disease.

That may be aggravated by years of poor diet and everything else. But. So it's a big deal. what I found to be the answer is herbal therapy. It just really, really makes a difference.

And more and more evidence is pointing to that. all plants have antimicrobial properties. They have to every living organism has to have antimicrobial properties, and that's even including bacteria have to defend themselves from other bacteria.

Fungus have to defend themselves from bacteria and viruses and plants due to we have a cellular immune system that was part of our evolution. Plants use a biochemical system to solve that problem.

So essentially plants immune system is a bio, a very sophisticated biochemical system. And that system is designed to protect the plants cells from invasive viruses, bacteria, protozoa, yeast, virtually everything.

Because plants are having a lot of the same threats that we are. Some plants are particularly good antimicrobials, and it really depends on the microbe stress that's present in that plants natural environment.

You know how robust a system it's building. So we know that a lot of herbs have really good antimicrobial properties. And that's been my interest in just looking at this thing and how we can evaluate this system for, for Lyme disease.

but the key thing about herbs is it's not a single chemical like an antibody. It's a spectrum, this robust spectrum of hundreds or even thousands of chemicals that are affecting microbes, not one way, but in dozens of different ways that are suppressive.

So it's a really interesting system. But like our immune system, our immune system is selective for pathogens but spares our normal flora. Right, right. Let's do the same thing.

That system affects pathogens but doesn't affect normal flora. And that's actually been done documented in scientific studies, which is really fascinating.

it's something that I observed throughout my whole recovery. You know, antibiotics would wreck my gut in two weeks. And I started taking these really potent herbs, thinking, well, I might get two weeks out of it.

Good luck. But that didn't happen. My gut actually improved the whole time I was taking herbs and I was like, wow, this is pretty fascinating. And you know, years later, after observing this and so many people actually found somebody took the time to document and this study, but they don't disrupt normal flora, and antibiotic resistance or resistant bacteria is unknown with herbs.

it doesn't occur to in the same way that it is. It occurs with an antibiotic. So we knocked down those two problems. So that opens us up to consider. Well, maybe this is something that we could use for months or years to suppress these things.

But the really great thing is it's not just the antimicrobial properties. You get. The herbs are also protecting cells in the body throughout the body.

And they are protecting cells from free radicals, toxic substances, virtually every stretch you can think of. At the same time, a lot of our herbs are immune modulators.

They're balancing immune function, so they're reducing those planetary cytokines. If, the microbes are using to drive tissue destruction, and at the same time, they're blocking enzymes that are, affecting our cells and affecting the ability of microbes to invade ourselves.

So the urge of doing all these wonderful things all at one time, and that allows us to use them as this foundation of therapy to do what we need to do.

And again, at the same time, they're suppressing pathogens in a gut and allowing on the wall flora to recover, which is exactly what we need with all this stress.

They also reduce our stress hormones. And, you know, it's just really fascinating to see all the ways these things work. It is it's amazing. And I love how all of the different constituents in the herbs work synergistically.

Right. So not only are you not having side effects, but you're having side benefits, which is just wonderful. I love this conversation so much. It is a lot of fun.

I, you know, I like to think about it like if you went to see a symphony, you're going to go to hear the Christmas pops and you walk in and there's one violin and that would be nice.

I'm sure the music would be beautiful if the if the musician was talented. But you add in the other strings and the brass and all of the other parts of the orchestra, and you have this sound that's just so much more than each of the individual instruments.

And I think of herbs in the same way that synergy is. Each of the herbs benefits are are enhancing the benefits of the other herbs. So when you combine them, you just get these wonderful effects.

Yeah, I couldn't agree more. And I think the you know, the great thing is, is that when you're using herbals, you know, I look at it as you're more you're rebuilding the body, right?

You're restoring function to systems, you're restoring health, you're fixing, you know, the immune system and helping the patient to heal, all while you're using the various anti-microbial actions of some of the same exact herbs to slowly shrink that infectious load, you know, and it's kind of like the infectious load is going down, while the quality and the health and the functionality of the patient is going up, you know, and then in the end, once you've restored their health and balance, their body can actually hold all of those infections that you've been talking about, kind of in remission, put them back into their, into their dormancy.

Yeah. Yeah. It's true. It's it's it's it is really cool to see how nature works. And it's just so far beyond what we are

technically capable of. It's, I just I just think it's so important for people to consider, you know, that boost from natural therapy?

I mean, there's so many other things that have value that you can do, but building that foundation with herbal therapy and other natural therapies, I just think is it's exceedingly important to really get where you want to go.

Yeah, I do too. Any thing. If you had to, you know, give one piece of advice to patients that are listening, what would it be? Yeah, it's that same thing.

don't focus on killing the microbe as much as restoring the.

Restoring health, prevention, and chronic illness insights

But your body's ability to keep all of your microbes in check in that internal tissue and blood microbiome that we're going to hear, be hearing more and more about.

that's so important. And one of the most important things that I think you can do right up front is starting to take a really good regimen of herbs. and there's so many herbs that we have so much evidence for right now.

And it's really important. and beyond that, you know, just, doing the things that you need to do to restore your health, healthy diet, low stress, getting enough sleep.

All of these things are so remarkably important. They're not easy. Taking your herbs comparatively is really pretty darn easy. But the more you're doing, and I think building that foundation is so important.

I see so many people and and I get it, you know, you get desperate. Nobody likes to be sick, nobody likes symptoms, and you just want to go somewhere and say, hit me with something that's going to make me, well, I get it.

But so many people miss those obvious things that they need to be doing that are so important. And they go directly to invasive and often expensive therapies that sometimes come back and actually make their situation worse.

Yeah. You know, with chronic tick borne disease, I would say it's it's one of the few diseases or conditions where like there is no magic pill, you know, there's no magic pill.

That's just going to make the pain go away. There's no magic pill that's just going to fix the brain fog or your heart palpitations or your thyroid issues, or your depression and anxiety or insomnia or, you know, fill in the blank, right?

Because it affects every single cell and system in the body. and I think it's I think we could all learn a lot from these infections, right? A lot about like, our bodies and what our bodies need to heal because there isn't any simple solution when it comes to Lyme disease.

It's like you've got to almost be in it for the long haul and be willing to make these lifestyle changes and, you know, change your nutrition, change your outlook.

There's there's so many things. And then that in conjunction with using all of these, wonderful herbs, just really helps someone to get like on their healing journey.

Yeah, absolutely. I think those things are always important, but it it's interesting. I would say at this point in my journey, I would confidently say that if you understand what's driving chronic Lyme disease, you've understood fundamentally understand what's driving every chronic illness.

It's fundamentally the same thing different microbes, slightly different stress factors. But that's that's what's driving illness. And what we're not doing in our conventional system for chronic illness is addressing the underlying causes

that are driving the illness.

We're just chasing the symptoms, and that's why people don't get well. so my step in point is to say, okay, let's take everything that we have learned with Lyme disease and let's start applying it everywhere else.

Because if we do these things in a week, we can start getting a handle on all of chronic illness. Yeah. I'm excited. I haven't, I haven't read your book, but I am going to now.

And, you know, I think you and I had had a conversation a while ago, and the takeaway that I walked away from that, was thinking, I wonder if some day we're going to realize that almost every condition is caused by some sort of microbe in the body.

You know, everything from all of our mental issues to physical issues. You know, some virus, bacteria, fungus, some microbe. Right. That's that's changing our biochemistry and driving it.

We are much closer to that than you might know. I've been following the world's literature for years. The scientific literature and it's, those connections are there, but they're being ignored by conventional medicine predominantly because they don't have anything to treat it.

They don't have any tools to treat it. Antibiotics don't work, drugs don't work. And if you don't have tools to treat something, I mean, this is the big deal with chronic Lyme disease.

This is why doctors don't want to mess with because they don't. They don't understand it and they don't have anything to treat it with. And when you are confronted with something like that, you just want it to go away.

Yeah. And and so again we understand chronic Lyme. Yes. And yeah. So when you look at Borrelia the microbe associated with Lyme disease it's been connected to dementia Parkinson's, breast cancer virtually everything.

But we expand outside of that and look at these other things that we're calling co-infections. Bartonella has been found in various kinds of cancer cells.

the babesia shows up in odd places chlamydia, Mycoplasma, Epstein-Barr. And these are just the ones that we know about that we're that we're that we're commonly testing for.

so what I'm finding is there's a whole lot more. And what we don't understand is the full scope of all of the microbes that can potentially be in our tissues, in a dormant state, and the possibility that some of those things are actually symbiotic, and they actually may be important for our cells to work properly.

So your cell a lot we have to learn. But those connections to chronic illness, you know, 20% of cancers are now absolutely connected with a microbe. I think, sooner or later that will be 100%.

They have been able to. It was an interesting experiment, that they took an allergy which has eukaryotic cell cells like ours. And they were trying to define how what what causes cancer.

So they they exposed this algae to all kinds of carcinogens and all these toxic chemicals and stuff. And the allergies just died every time. No cancer just died.

But then they took the allergy and put it in a closet so it wasn't getting sunlight that stressed the cells. And then they exposed it to an intracellular bacteria.

That's common in that algae that exist in that algae. Even when the allergies and healthy state. But they exposed that the stressed cells, the stressed algae cells to that bacteria turn to cancer every single time.

And what they found was that the bacteria was inserting its gene for unregulated growth into the genome of the cancer, and causing it to have unregulated, unrestricted growth.

So you think about it, that's the that's the connection. All of our cells have restricted growth. When you look at heart cell or brain cell, you can't have that thing just dividing randomly.

It has to be in a very, very restricted control growth. That's that's defined by the genetic program inside the cell. All bacteria have restricted unrestricted growth.

So long as the food's present, they'll keep right on growing. Throw them in a petri dish full of food, eat all the food. And and they keep growing at the expense of all life around them.

So to add the fact that when our cells become cancerous, they take on unrestricted growth like a bacteria, and then you start looking at all these microbe connections, you can't not think that there has to be a microbe connection.

And then you look at all the different tumors and cancers that they started finding intracellular bacteria, including Borrelia, but a whole lot of others inside cells.

Even there was one study that was talking about different tumors have different intracellular microbiomes. So yeah, it's pretty fascinating. But the herbs who can protect you all herbs have anti-cancer properties.

Every herb that I've studied, somebody has looked at it and found anti-cancer properties along with antimicrobial properties. So definitely something we should be paying attention to.

I could not agree more. You're speaking my language. Thank you so much for joining us once again. Would you please tell the audience where they can find you and about your books and anything else that you would like to leave us with?

yes. again, I'm medical director for a company called Vital Plan that you can find me and information about me at Vital Plan V I T A L P L A N.com and, Yeah.

And my latest book, The Cellular Wellness Solution. Thank you for having me. Thank you so much for being here. And thank all of you at home for watching.

We'll be back soon. And it's a pleasure.