Unlock Health Insights: Predictive Analytics and Gut-Brain Axis Transcript

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Introduction and guest welcome

Welcome, everyone, to the Reversing Chronic Crohn's and Colitis Summit. I'm your host, co-host, Dr. Christine Schachner. And today we have a special guest, Dr. Sierra Simpson.

Welcome, Dr. Simpson, it's an honor to have you on the summit. Thank you so much for having me. I'm really excited to be here today. Yeah. So I am new to your work and I love learning.

And that's a big driver for me to get this education out there. And we met through our mutual friend and colleague, Dr. Hamel Patel. And when he heard I was doing the summit, he was like, you have to talk to the earth.

so you have, you know, a story and, an amazing project that you started around, our microbiome. so why don't we just introduce you to the audience and, get them to know a little bit about, your journey.

for studying the microbiome. Perfect. I think my journey really informs why I think studying the microbiome is important. it all started out with malaria, which is kind of weird.

I, I had malaria in undergrad and was a very high powered athlete, and it really knocked me to the ground, and we didn't know that it was malaria for almost a year, actually.

So I ended up being on ten rounds of as a remission for ten days out of the month for an entire year. So, 120 days I was at remission. really impacted my physical and mental health.

And and as a scientist, you know, I'm a neuroscientist by training. I was doing, my undergraduate at UCSB in molecular and cellular biology with an emphasis in neuroscience, and then later went on to do my PhD in neuroscience.

I was like, well, I'm a scientist.

Microbiome journey and neuroscience background

Why can't I figure out why these antibiotics made such a huge impact on my life? And so when I went to do my PhD at the Scripps Research Institute, I had the opportunity to mix, the microbiome into my PhD work.

And we all know that the got brain access is really important. We have many, many neurons that integrate in the peripheral nerve nervous system. But most neuroscientists stop at the neck and then don't think about anything else that goes below it.

We're here to reintegrate them, right? We want to reintegrate things a little bit. Yeah. and so my PhD really focused on the intersection of how our microbiome plays a role in behavior, specifically, addicted B addictive behaviors.

and there I found out that if we modulate the microbiome, we can actually change how individuals take opioids. we've subsequently looked at like, stimulants, like cocaine and alcohol use disorder as well.

And I think there's a lot of new literature coming out that is showing how all of these systems are fully integrated and how we really need to look to the microbiome in as a whole health meter.

and so we integrated artificial intelligence to predict individuals that were more likely to be addicted to opioids, and then have subsequently apply this to a variety of disease states, including Crohn's and colitis and cancer, heart disease.

and after I finished my PhD, I went on to found brilliant Biome. So, we wanted to make this type of analysis actionable, easy to understand. The microbiome was still very much so evolving as a field.

And now that sequencing is inexpensive, I mean, relatively so in comparison to what it used to be ten years ago, we can do this on a regular basis, and it should be something that everybody does to monitor their microbiome and help with their overall health in general.

Yeah. Incredible. You know, so often in personal journey that, you know, allows us to dive deep into those, you know, these fields, especially at the neurosciences.

But I'm so grateful that you, got this message and, you know, to release today. I mean, we, in treating, you know, gut brain health, you know, for over 14 years, I've been really looking at this, and, there's definitely a relationship.

So I'm so glad that you, have founded your company. So tell us a little bit about. Brilliant. so, there's obviously a sequencing of the microbiome available.

And then how did that play out to the average person is it's only a research tool. Is it, accessible for, you know, the average person? yeah. Just tell us about the mission.

Yeah. So we've been working hard to optimize what kind of sequencing we use. Many of the tests that are available in the market only use 16 sequencing wedge sequences.

One gene that has a very variable region that allows you to see what kind of microbes are there, but not with the specified nicety that other kinds of sequencing allow, like shotgun metagenomics, which is what we do.

It's a bit more expensive for us to do that. But when we were looking at the data, I just thought it's more important to see everything that's there and the functions that those microbes are doing and really invest in getting that knowledge so that we can make it so that it's actionable for individuals.

And so we've been working with pharmaceutical companies doing patient stratification, understanding why certain cohorts respond to drugs. And we're opening our direct to consumer, pipeline in the next three months.

So people should be able to send in their sample. It's really simple. You, you order your test, it comes to your house, you collect it at home. Nobody likes to have to go to the doctor and try to poo on the spot.

Brilliant Biome mission and sequencing approach

Yeah, it's just not feasible. Yeah. Yeah, totally. So a little blue package comes in the mail, something like, you know, kind of looks like this. And, it's got a stool catcher in it that you can flush.

So we tried to make it a very friendly experience. Dealing. Dealing with poo is never fun, but we we make it as easy as possible. You ship it back to us in the mail, and within two weeks you have your sequencing results.

Awesome. Are you looking at just the, person's microbiome, or are you also detecting, this biotic flora at or opportunistic? pathogens or, as your case, you had malaria and I treat a lot of people with, chronic, persistent Lyme disease.

So we deal with often co-infection which is very similar to malaria. So when I heard that I know there's an application for this here. So, just curious to look at, goes this biotic flora as well.

Yeah. The great thing about our test is because we do shotgun metagenomics, we we see phage, we see fungi, we see protists, we see microbes. we're working on new technology to learn more about the host as well through metagenomic.

So save you some money when you have to sequence yourself looking for snips that are related to say, you know,

cancer. that's all in the pipeline to give you as much information as possible.

Yeah. How exciting. You know, I, definitely, you know, I've had it be more a clinician and get satisfied with accurate lab work with soil analysis. Since I've been practicing, I mean, it was getting better and better.

but we find, like, parasitic infections, very hard to diagnose. also even just opportunistic, you know, commensal flora that you just shared, there's like a lot of variation.

So I think that this is going to be really important, especially with the, you know, the audience that we're speaking about with inflammatory bowel disorder.

I find that in conventional medicine, if there's not a biopsy to, you know, demonstrate these microbes, there often can be a, radical decision, rather than looking at, just, you know, this is always a symptom.

You know, there's, you know, we always look at root cause kind of from where I'm sitting and we don't think the body is, you know, dumb or, you know, always attacking itself.

There's always a reason, why? And so, Yeah, I'm really excited about this. Do you give them recommendations for treatment or, probiotics. Where do you stand? There.

Yeah. The beauty of our system is that we have over 60,000 individuals in our database. So not only do we look at you in relation to those individuals, but also, you know, in your age range of your ethnicity with your similar habits, we collect that information about you so that maybe your microbiome is shifted for, you know, say a woman in your 30s, but you live in an area or you eat something, you eat in a different way.

We want to correct for that so that if you fall outside of that range, we can say, okay, in these three categories. For these three commensal, we want to increase x, y and z to get you into a range that is coherent with our other healthy individuals that are not experiencing flare ups or experiencing, you know, gas or bloating or whatever other issues you're reporting to us.

We can help balance that. And we do that by looking at the metabolic pathways that are going on. What are the genes that are being transcribed, how how that is regulated?

what what is the potential of those microbes and fungi and Proteus and everything else? That's living in you to create the ecosystem that you're experiencing in your healthy or your disease states?

Awesome. Would this be also an application for like an home team and lunch?

Using AI and microbiome data for personalized insights

Like I don't match, like, you could take and, you know, like, so there's a trend especially obviously it's only approved for, Clostridium difficile in the US, but, there, you know, is this whole kind of, treatment around fecal microbiota transplants and, you know, we've learned the hard way if you don't get, you know, the correct microbes in your gut, you can have, you know, more of a pattern that is not your own, you know, genetic blueprint.

you know, we've seen this with weight gain and all sorts of other things. So I was curious if you've thought about applying it to, that community. We have considered it.

I think, you know, FMT really has to only be used in very special cases because, as you're right, so hard to find the right match. We're still not sure exactly what happens when we match somebody like the like weight gain, hormonal changes.

There's a lot to consider. so you could potentially learn about potential donors, and the potentiality of their microbiome. we haven't done the research to understand exactly how that translates from person to person.

But, you know, we're always open to research, collaborations. part of what is really beneficial about our artificial intelligence platform is we pull down all of the latest literature and integrate that into our analysis to give you the most up to date, information.

You know, for instance, we were working with this one woman. She had intractable constipation. And it turned out that it was a very specific strain of Shigella.

And I was like, it's really weird that we're seeing the Shigella in this individual. Normally Shigella causes diarrhea, but, it was releasing we saw that it had a metabolic, potential to release this fatty acid that would actually paralyze muscle.

And so the right course of antibiotics two weeks later and she's back to normal. And she had been dealing with this for eight years. So we're unlocking the potential to see with precision how can we help each individual.

Oh, this is so exciting. You know, because we have to take a gamble and not use a lot of, like, different, techniques other than my clinical diagnosis.

So using like by a resident muscle testing and all these other, techniques that are getting a little bit more accepted these days to help identify and like I would never be found in a regular on peer stool test, you know.

But there and they had done the lab core test. They had done several other tests. And yeah, you may see that there is Shigella present, but not the specific strain that would lead us to the actual diagnosis that helped her.

And one of the theories that we have a lot when we treat people are the bio toxins different? microbes produce. And then that's actually worse than the actual bug, you know, and so that, combining the metabolic, profile, that's amazing.

I definitely, and so intrigued. so what do we need to know about inflammatory bowel disorders? So these are patients? yeah. Who have either been through radical treatments.

they're obviously grouped in as, inflammatory, even autoimmune, category. you know, there's a very narrow window of what pathogens people believe are associated with these inflammatory bowel disorders.

So, can you just shed some light on what you found? I think from a broader perspective, what we found that is really important is seeing the unique ecosystem of each individual and then taking a stepwise approach.

You can think of the microbiome as like a forest. If it has the right predators and prey, the ecosystem is going to be balanced. But you know, if all the predators are wiped out, then the prey are going to go crazy.

And it's the same for any kind of commensal microbe. Everything is within balance. So if we find that there are key 3 or 4 keystone species of microbe that are unbalanced in those individual, we also look at phage like, do we have a high abundance and phage, which we see in many Crohn's and colitis patients that are limiting their ability to bring in the appropriate microbes that will help them come back out of that inflammatory state.

So it's setting a very, you know, slow but efficient timeline in steps to get them in that direction. I think doing too much radical change at once, you know, if we're doing lifestyle change, diet change, adding in ten pro and prebiotics, it's too much because the ecosystem there is too fragile.

So approaching it stepwise and doing things like increasing short chain fatty acid production really helps mitigate the inflammation locally. And then also systemically, it starts to reset the body's reaction to those microbes that are causing problems.

Do you see any specificity and like let's say Crohn's versus colitis? have you had that data yet?

Inflammatory bowel disease and ecosystem balance

We've been building those data sets and, and working with individuals in the community to collect that data and, expand it. And there definitely divergent clusters of individuals.

And I think it also gives them hope. Right. People get, an umbrella diagnosis, but they're like, oh, I only fit three of the ten symptoms. What's different about me that makes me have these three and not those ten, and maybe not be recognized by the community right away.

so we're building that up certainly to, to help those communities. If anybody was listening, could they donate a sample to your AI technology? Yes. I'm more than happy.

they can reach out at hello at Brilliant Biome. And, our friendly microbe explorers will reach out to you and and find a way to collect your sample. Yeah.

No, I think this is like, groundbreaking. And, you know, I it has a lot of pros and cons, especially in people's just consciousness right now. And this is such an elegant use of it, you know, to just like, you know, speed up like that 17 years of, like, from, you know, basically research to getting in the clinic at all or, you know, offices, you know, so I, I love that.

So I mean, I think there's just so many, things that we can do. One about, a patient who just wants to sequence their microbiome right now and not necessarily, they're not they're happy to donate, but they want to learn about their, microbiome and discover the, you know, potential that there is, like this woman who had the Shigella, diagnosis.

how do they work with you? We have, a wait list that if you go to our website, you can sign up on the waitlist. And we've been releasing them in small batches.

and then our full consumer launch will be in the next three months or so, so that we'll have a brand new dashboard. You can interact with your sample, you can ask questions natively.

We we built an AI around me giving reports as well. So you can even kind of basically type in your results. And it pulls from the the I trained on my brain to give you some answers right away.

And then you can also, book consultations as well. Have you seen like the US like a signal of strep overgrowth in the gut with different, conditions? Oh, that's a really good question.

I'd have to pull up the dashboard and play around with it to see, because we have it tagged in to for incrementals. Like what diseases that are related to how those diseases are related to each other.

Well, we tried to start building this very interconnected constellation because there's so many comorbidities that we see, you know, for instance, we have a very large autoimmune community.

And so, you know, where how is that autoimmune manifesting in the body? And like, what do we see about those individuals that we can help them with? Yeah. Now amazing.

I think, you know, again, like I would love for offline to to have conversations with you and also participate in the research because I think this is just like the missing piece.

we have awesome tasks and people who have done such a great job bringing these tests to market, but there's a lot of, questions still of what to do with that data and kind of where they are against the population.

so I think there's, so many applications, to see. I mean, we have a lot of neurological, patients that we also look at the, that associated lymphoid tissue impact, on, you know, like especially the, like the priming of the immune system from the sinuses in the tonsils.

So I think extending the ear, a kind of micro microbial, analysis to those tissues would be informative for different

gut issues, too. we see that connection a lot.

So I think that's amazing. you know, the skies are endless, right, with the technology as it gets up and running. It's funny, you bring it up because the next thing to come online for us is going to be oral microbiome.

And we've been working with functional dentists to say, okay, we want to prime you from the food comes in this way. We're not just looking. You know, where it's almost at the exit.

We need to we need to think about the gut all the way through because, the more research we see, the more important we realize that that that is going to play a big role in priming you and also your gut so that your guts in a good place to take any intervention that you give.

Future applications and closing remarks

Yeah, absolutely. Yeah. The oral microbiome we see a lot with conventional dentistry kind of gone wrong. there's a lot of, this biotic flora and we know, like, the connections with Alzheimer's and even cardiovascular disease.

And then after, please, the sinuses and the tonsils, because I would love to hear what you find. You know, in our tests that our labs have can only read so much.

I think there's a lot in between, that we're not catching because of lack of knowledge or lack of this technology coming. so we'll. Have to find a way to, to get together on that, because I.

Know, I know, we can stamp all the, you know, just there are some labs, you know, obviously throat culture is easy. there are sinus cultures. There's a lab on the market that looks at bacteria, fungi and, biofilm.

But there's only so much of each, you know, that they I mean, we think, like, life is like 12 species and it's like. Yeah, like thousands or millions.

I don't know, you're the expert, but, that's where I think we, miss things for people. I always like to joke. It only takes 28,000 genes to build a human, but your microbiome has between 6 and 8 million unique genes.

So we're basically just a spaceship for those microbes to get around. Yeah, I know we're like the creator of those microbes, you know? So it's like we have a whole universe within us, you know?

So yeah, I love it. All right. Well, Sierra, anything else left on your heart or your mind to share with the audience before we wrap. I think it can be really challenging for Crohn's and colitis patients to get the kind of nutrients in that they need their microbiome to see to reduce the inflammation that's there.

And so, usually my front line when I'm working with people is digestive enzymes, because it does help get things in a better space so that their microbes can utilize those nutrients.

Of course, always check with your physician before you you go on to those things. But and then considering, you know, soluble fibers in small quantities, we really want to amp up as much short chain fatty acid production as we can, both in centrally and peripherally.

that is the first step to creating an environment where those keystone species that are going to put you in a place where you're going to stay out of a flare because you have more resilience.

We want to build in the diversity, and we want to build in the resilience by providing that foundation for the for those microbes. it's a good place to start.

And I it can be challenging because those foods are not always as compatible with their, their gut. So you have to try different things along those same families.

You know, those indigestible fibers in small quantities are a good place to, to go. or even I don't know if you use try butyric acid, but that's also an oral supplementation of that is also a good place to start.

If you can't get it in your diet. Yeah, I use a product line for the healthy gut. They have a tried beta and it's from Spain. But yeah, I like that one to be good.

and I, I again, I have no affiliation other than you know, this is what I think clinically. Neuro hacker collective just made the symbiont, symbiotic, prebiotic kind of mix.

It's, pre post, and probiotics. And it's actually one that people tolerate. Oh that's. Great. Yeah. So I'll get in hooked up with them. and then we do I. V.

therapy or even injection in people subcu B-12 or, you know, other subcu injections if they're comfortable to do that at home. Because I agree. And there's also pill suppositories or rectal implants that you can get vitamins or amino acids or minerals, and through that kind of like, delivery from rectal absorption through the colon and the circulatory system in the lymphatics.

So, no, I think that's really great clinical ideas for sure. And you definitely the colonia sites want to see those short chain fatty acids. They're the ones that signal to the rest of the body if they're there or not.

So I love the suppository angle. I think that that's also been very helpful. Yeah. Awesome. well, Sierra, this was really informative for me. I think the like sky's element with what you're doing.

and I'm really excited, that you've shared this like very innovative next level, application of the microbiome science that we know, to really help people.

so how can people get in touch with you? The best way to reach out to us is through the website. hello@brilliantbiome.com We have people monitoring them.

They'll they'll put you in touch with me. And, if you want to do research collaborations or you're interested in donating samples, we're very open to helping the community.

So, you know, I'm here as a scientist. I want to bring the research from bench to bedside so that we don't have to wait 20 years to have changes because, like you, I believe in taking the whole individual and finding that root cause so that you can live your life and go on vacation and, and and enjoy eating the things that you like.

All of the simple pleasures. As a human, I, I want to enable that for as many people as possible. absolutely are on the same page there. And, and so I'm grateful for your contribution at the summit.

Thank you so much for being here. Thank you so much for having me. You.