Michael Roesslein:

So we are recording. Welcome. This is the first official Product Spotlight Webinar with Rebel Health Tribe. As I was just saying before we went on recording live, we're going to be doing these to provide really solid education around any of the products that we have in our shop so that people can really get the low down on each product and get educated and make the best decision. So I am here with Kiran Krishnan, the Chief Science Officer at Microbiome Labs. Welcome back again.

Kiran Krishnan:

Thank you. Thank you, it's good to be back doing this.

Michael Roesslein:

Fancy virtual backdrop. Today, this one, we are going to be talking about MegaSporeBiotic. I figured if we're going to do a series on the products, MegaSpore needs to be the first one.

Kiran Krishnan:

Yeah.

Michael Roesslein:

As it was what kicked off everything for you guys. In a lot of ways, kicked off everything for us. That exploded at the same time.

Kiran Krishnan:

Yeah.

Michael Roesslein:

And it's something a lot of our community are really familiar with, the people who have been with us for a really long time. But then we've done the masterclasses in the last couple of years and a lot of new people have come into Rebel Health Tribe who may not have the same level of education around it. So if you're new, welcome. Hopefully you're going to learn a lot of stuff. If you're not new and you know about the spores, there's a lot of new research that I probably only know a little bit of. So that's going to be a new version for you. And then at the end, we're going to pick three random people from the audience list at the end, and we're going to give you some free spores. So that's something we've never done before. So we will reach out, I'll get your address and we'll get some spores shipped out for people at the end. So stick around.

If you could let me know in the chat that you can see and hear us okay, that would be helpful. I'm on a tech situation here that I've never used before. And then the chat box tends to go really fast and people are commenting in there, having conversations in there. It scrolls really fast. I try to keep up with it, but if you have questions, please try to use the Q&A box or tab or button, or whatever it looks like with what you're using. And the questions in there are the ones that I'm going to go to first, are in the Q&A. It's easier that way to keep it separate. You're free to type things in the chat. I'd encourage you to try to focus attention on what's going on on the screen. But if you're in the chat, have those conversations, just please keep the Q&A in the questions. And we have a lot of people here, so that's fun. And let's just get the ball rolling.

So I guess I don't even know. You guys sent out an email to us practitioners recently with some origin story a little bit on MegaSpore. So I guess I'll start there with where did the idea for the product come from? Who thought, "Oh, we should make this," and why?

Kiran Krishnan:

Yeah. So prior to doing this, prior to having Microbiome Labs, I have a research company, it's called Live Smart. And then we have another technology development company called Nu Science Trading. Both of those I've had for... I don't know, 20 years, almost 15 years. One of the main focuses of Live Smart was about doing really good, smart clinical trials for nutritional companies. That was my whole focus was how do I bring about more opportunity for clinical research to nutritional companies, but change it a little bit? The way clinical trials are designed right now, it's predominantly for pharmaceutical outcomes which means that the costs are really high, the degree in which you have to do a study to prove something is really high. For those of you that are not familiar with clinical trials or how to design them, that's called powering the study.

So for example, to do a blood pressure study, right, let's say you had a pharmaceutical drug that you claim could lower systolic and diastolic blood pressure. Blood pressure has a lot of variability in it. Blood pressure has a lot of other influences, how you feel that day, what you ate that day, what you drank that day, all of those things can impact your blood pressure. So in order to show that your compound has a true effect on blood pressure, when you power the study, you find out statistically, because there's a lot of placebo effect and a lot of other influences, that it has to be a thousand person per arm study to get the statistical significance, to weed through all of the other variables that can impact blood pressure. And so when you look at that from a pharmaceutical standpoint, that's exactly how they do those studies. They power it based on a statistical analysis of the outcome and then they figure out what the size of the groups have to be.

Now, let's say you've got a natural compound that helps with blood pressure, no natural company is going to do a 2000 patient a thousand per arm study on their product, because a thousand patient study costs roughly a thousand times around $5,000 per patient, right?

Michael Roesslein:

Wow.

Kiran Krishnan:

So it is not cheap. We're talking about a million dollar study to do that. Now, pharma companies do that all day long. They'll do that and they'll have 999 out of a thousand of those trials fail. But when they have one that succeeds, they make tens of billions of dollars. So it's worth it for them. But nutritional companies can't do that, right? So that was one of the things I recognized early on as being a real barrier to entry for nutritional companies to get into research effectively.

So then taking that same model, what I would tell nutritional companies, I would say, "Number one, even if your product works really well against a blood pressure, why would you ever study it?" Because even if it brings down blood pressure and we can prove it, you have the money to prove it, you can't say anything about it in the market, right? Even if you had a 10,000 patient study, you can't go out and say, "Our enzyme or vitamin," or whatever it may be, "Reduces blood pressure," the FDA would have you locked up. And so what's the point of studying the blood pressure endpoint, right? Why don't we study mechanisms that lead to a reduction in blood pressure? So changes in things like angiotensin, so more structure function things. And when you start looking at those molecular structural things, you don't need a big group because those things aren't as effected by other variables, right?

So I started designing trials based on mechanism and things you could talk about because you can go out and talk about how it changes the mechanisms involved in blood pressure, but you can't talk about the blood pressure endpoint, right? So that's a long way of just explaining what I used to do prior to Microbiome Labs. And as part of that and part of the ingredient development company that we had, we were hired by a large multinational company to study the probiotic market, if you will, and in a way, come up with the next generation of probiotics.

And this was back in probably 2000 and maybe eight, nine? Somewhere around there. And so we said, "Okay, this is a fun project. We're going to go investigate the probiotic industry, look at the claims people are making, trying to figure out what are those next awesome strains. What's the best approach to take with probiotics? Do we go refrigerated, not refrigerated. Do we go 500 billion? Do we go 30 strains? What is that the right approach?" That's what they wanted us to figure out.

And in our investigation, which many of you have heard me say, that we've come to find out that most of this stuff out there is nonsense. None of it in terms of how they design probiotics is based on any real signs. It's really megalomaniacal marketing, right? It's like, "My competitor has a hundred billion, so I want 150 billion. But I want 150 billion at the same cost of a hundred billion, so I've got to go a few notches down in the quality of the strains to meet that same price point," right? So then that's how the probiotic industry rolls along. It's just, "More is better, more is better, but we got to keep the price point the same so quality goes way down." And so we found that to be a real issue and we started going, "Okay, what else is there in terms of strains and what is the strategy one should understand to utilize a probiotic in the right way?"

And so we came to realize quickly that one of the really important factors was it has to survive through the gastric system. If it's not getting in alive, it's not really acting as a probiotic. It may do something, but it's not really functioning as a probiotics. So we said, "Okay, what can actually survive through the gastric system without us putting a bunch of technology on it?" Right? So that would become your foundational type of probiotic. Then second part of it is what is supported by evolution? It has to be a microbe that we would naturally come across and get exposure to. If not, we don't know if we're creating a disturbance in the microbiome, right? One of the things that always made me nervous when I looked at probiotics was these kitchen sink high dose products, because where in nature do you get 200 billion of lacto and Bifido every single day, right? It just doesn't occur.

So then the question is over time, does that actually create some dysbiosis? And sure enough, there are studies coming out now that's showing that it can create dysbiosis. For example, that Israeli study last year, that showed that when you take those probiotics, it actually slows down the recovery of your microbiome after you take antibiotics. So it actually makes it harder for your commensals, your indigenous bacteria to come back because these big kitchen sink high dose products will start to compete with your endogenous bacteria. So we had already a sense that those things would be problematic. And so we didn't want to go that route. We were saying, "Okay, what has to survive through the gastric system? What can we naturally get exposed to and we have been naturally exposed to?" And then the third part, which is the most important part I think, is what microbes can facilitate change in the rest of the microbiome?

And this is a really important point because when you think about it, even if you put a really high dose probiotic in there, a hundred billion CFU dose, right, you're putting a hundred billion CFU dose into a sea that is upwards of 40 trillion organisms. So it's a little drop in the bucket. So if you're counting on the probiotic effect from those strains themselves and their metabolic activity, their ability to influence the rest of that complex ecosystem is really limited, right? So in order for you to really feel the effect, these probiotic strains have to go in and be able to influence the rest of the microbiome. That's the only way you'll see not only profound and realized effect, but broad spectrum effect in the body. Those things will be illustrated when I share the studies with you.

So those are the criteria we use. Now, we then investigated looking at all the different strains. We came up with these Bacillus endospores, they met all three of those guidelines. Then we formulated the MegaSpore in such a way where we anticipated that this will be a similar type of exposure you would get if we were living how our ancestors lived for the most part of human evolution, right? So we were going for a dose that is a normal exposure dose from natural environments, and then we were looking at these strains in consortium. Most of the time when you find Bacillus endospores, they're not by themselves as single strains. And so we said, "Okay, the real way of doing this is to use a consortium." And so that's how we put the five strain consortium together. We knew what each strain does to a certain degree, so we adjusted the formula based on what each strain does. And then the total was four billion CFUs in five strains, right?

Now, what was interesting about it, which I don't know if people know this or not, is that our last idea was to launch a product or a company of our own, right? I'd been working at that point with loads of companies in our space. I was consulting for them, doing research for them, doing all kinds of stuff. My business partner, Tom, had also been working with companies in our health space. And so for the first six months, what we did was we took the concept around to all of these other companies to try to get them to pick it up. So the MegaSpore formula that everybody knows now was a formula that we were shopping around to all of these other companies. We would take it to their R&D teams, we'd take it to the owners of the company and go, "Hey guys, we've been doing this research for a couple of years. We think this is the next big thing in probiotics. This is how it should be formulated. This is a product we can get you the strains. We believe you should launch this as a probiotic."

And everybody passed on it. And the biggest reason for passing on it was A, they didn't really understand this concept of spores, but B, the big thing was the dose.

Michael Roesslein:

Not enough of them.

Kiran Krishnan:

Not enough. four billion. They're like, "Our top selling probiotic right now is 30 billion. How can we sell four billion and claim that it's effective?" And we were like, "Well, that's the opportunity to educate," right? You need to talk to people about how with these strains, it's really the quality and what they do. You don't need 30 billion, 40 billion, 50 billion. It makes no sense. And do you really need 30 billion in your other product either? We would always-

Michael Roesslein:

That's a different line of questioning.

Kiran Krishnan:

It is, and that never gets us very far with many of these companies. But they could not wrap their head around this dosing. That was this big objection we would get, because that is where the value is according to the market in probiotics. The more CFUs, the more expensive it should be, right? And so-

Michael Roesslein:

I had that barrier with it. When I first watched some of your guys' stuff, I had the same initial objection. The only thing that got me over it was that I saw Chris Kresser recommend them.

Kiran Krishnan:

Right.

Michael Roesslein:

And I was following him at the time and really trusted his recommendations. And I was like, "All right, that guy does more research than I do. So I'll give it a whirl."

Kiran Krishnan:

Yeah.

Michael Roesslein:

But I initially saw one of your presentations and I was like, "Four billion. What is this guy doing with that?"

Kiran Krishnan:

Yeah. It's a complete paradigm shift, right? I mean we knew we were coming in to disrupt the model and we were excited about that. But we had no idea if that would have any success at all because perhaps what could have happened is most people going to just shrug this off like, "You guys are nuts," which happens a lot in paradigm shifting, right? So we got fortunate and people started listening to what we said. And then we also had this idea of really focusing on the research, that we've got to show people how this works and we've got to show them that most of the products that they trust don't have any studies behind them. And so you don't know what it's doing in the gut. You don't know how it influences the microbiome. You really don't know what the effects are in the system unless you do the studies that we do.

And so that became our premise. We launched it and we went for it. And I don't know if you're interested in hearing the launch plan, but I mean in six months after launching, we were almost completely out of business, which means that we wouldn't exist today if we didn't stick it out, right? We didn't have a whole lot of capital to launch the company. I think we launched it basically with about $80,000. And the idea was we were going to go for low hanging fruit. Our low hanging fruit was we had to be able to get in front of people and do a talk because this was too much of a paradigm shift to do it in a 30-second marketing piece or 15-second, or little ads.

Michael Roesslein:

Or a pamphlet or a thing at a table somewhere. Yeah.

Kiran Krishnan:

Totally. You can't, nobody's going to get it. And so we're like, "We got to get in front of people. If you give me 45 minutes to talk to them, I'm pretty sure I'll convince them." And so that was the premise. And so we said, "Okay." My business partner, Tom, is a chiropractor, right? So he goes to CME events for chiropractors. There's only one state in the U.S. where chiropractors have to be present in an event in order to get their CMEs. All other 49 States, you can do it online and that's what a lot of chiropractors do. So that one state is Florida. And Florida also happens to have the most number of chiropractors. And so there's events, there's CME events like the Florida state Chiropractic and there's two or three other associations. They all tend to be very well attended.

And Tom said, "I know chiropractors. I'm a chiropractor, I know how to talk to them. So let's try to get in front of them. Let's see if we can..." That becomes our first audience. So our very first show was a Florida Chiropractic Association show in Destin, Florida. This was-

Michael Roesslein:

I've been there. [crosstalk].

Kiran Krishnan:

Big, big beautiful white beach, right?

Michael Roesslein:

Yeah.

Kiran Krishnan:

A gorgeous area.

Michael Roesslein:

It's on the North Shore, it's on the Panhandle.

Kiran Krishnan:

In the Panhandle, yeah. It's a beautiful area really.

Michael Roesslein:

My grandfather retired there.

Kiran Krishnan:

Did he?

Michael Roesslein:

So it was about 10 years where I got to go there all the time. Yeah.

Kiran Krishnan:

I love that area. That's the nicest beaches to me in the U.S. And so it was in Destin. And of course, when we first decided to do this, we contacted them and said, "Hey, is there any way we can do a talk?" And they were like, "We don't know who the hell you guys are. You're not speaking in our program." And we're like, "Okay, how do we get in front of people?" So we got a booth and then what we did is we came up with this concept of doing a lunch lecture. And believe it or not, the association at that point had never heard of this. No other company had offered to do this. So we said, "Okay, we'll buy your attendees lunch if they come for 45 minutes, 50 minutes and watch us talk." And they said, "Okay. If you want to do that, let's do it." Remember, we had 80 grand to start this.

And that whole show, from Tom and I flying there, staying there, the cost of the booth, to exhibit, and then the two lunch lectures, we had both a Saturday and Sunday lunch lecture, all together then cost us eight, 9,000 bucks. So it was more than 10% of our total budget. And that first day in lunch lecture, we were all excited. We're like, "All right. We're going to really tell people this stuff, convince them." Two people showed up to the lunch lecture, right? And we're like, "Holy crap."

Michael Roesslein:

[crosstalk 00:00:18:53].

Kiran Krishnan:

We're going to be out of business before this thing even starts. But the good news of all of that is one of those two bought product, right? And that was our first customer and he's still a customer today. He still buys regular the same amount every single week, since 2013.

Michael Roesslein:

Do you guys give him a little golden bottle of MegaSpore or something?

Kiran Krishnan:

We should. [crosstalk] Yeah.

Michael Roesslein:

Make sure he gets the millionth bottle or the whatever. Yeah.

Kiran Krishnan:

We totally should. I love that idea.

Michael Roesslein:

Yeah.

Kiran Krishnan:

So we were like, "Okay, 50% conversion rate, but there's only two people." Second day, nobody showed up for the lecture, right? It was Sunday, everyone got the hell out of there. So we were like, "Okay, this is maybe not the best approach because we can't afford to keep doing this and bringing in one customer at a time." But we were like, "But we got to stick with this. We have to tell the story." And so we said, "Okay, let's just do it again." Florida Chiropractic Association had another show in June and I guess a little bit of a word got out by then. And we had something like eight or nine people at that lunch. And again, most people who heard us talk bought product. Then they had their big show in July. And we had about 30 people at that lecture.

So we just kept going with it. And we had a lot of touch and go moments where we're like, "Well, we're pretty much out of money and we don't know if we can afford to go to this next one. So we just use credit cards or whatever we need to use to get there." And by the end of that year, we had done five shows and we had probably picked up 50 customers. And they were loving the product, we were getting good feedback. So we said, "That's what we're going to do. We're just going to double down on this and go full steam ahead." And so that's how we started the company and where the product came from.

Nowadays, I knock on wood... Not knock on wood, but I'm eternally grateful that all the other companies turned it down, because if one of them didn't and they had picked it up, Microbiome Labs wouldn't exist today, right? So we would have been just doing this from behind the scenes the whole time. But as of last year, we did 160 conferences last year in one year, right? So six years before that, our first year we did six. So we really pushed this.

Michael Roesslein:

Do you know how many countries you were in in 2019?

Kiran Krishnan:

Yeah, I think I lectured in I think 12 countries. 12 different countries.

Michael Roesslein:

That's crazy. When I first started working with it, I think you were still in the hundreds of customers.

Kiran Krishnan:

Mm-hmm (affirmative).

Michael Roesslein:

I think it was under a thousand. I think you're somewhere around 500 or so doctors, mostly practitioners, chiropractors.

Kiran Krishnan:

Yeah.

Michael Roesslein:

How many customers do you have now? How many professionals?

Kiran Krishnan:

About 25,000.

Michael Roesslein:

Wow.

Kiran Krishnan:

Yeah. Active, regular. And we get awesome feedback from them. It's been crazy the scale of it, but I flew 400,000 miles last year and that's part of the reason-

Michael Roesslein:

What's your airline?

Kiran Krishnan:

American

Michael Roesslein:

When you walk up to the gate, do they all get on their knees?

Kiran Krishnan:

In that movie, Up in the Air, there's that special concierge key status that George Clooney gets at the end of it. I have that special concierge key status for-

Michael Roesslein:

So, "Now boarding, Kiran."

Kiran Krishnan:

Yeah. I board first, they announce it and they will hold up the rest of the boarding for me to actually get on the plane. If I'm like, "Oh, I'm going to run to the bathroom," they'll say, "Okay." They'll stop the rest of the boarding. But I don't know, I haven't flown much this year. So we'll see what happens.

Michael Roesslein:

Wow. That's crazy. And I think a lot of us who have our own businesses can relate to the, "Well, we have this much money and half of it's gone now and who's got credit that we can use?"

Kiran Krishnan:

Totally. Like, "What can we do?"

Michael Roesslein:

"This sounds like a really good idea, but why isn't this working?"

Kiran Krishnan:

Yes. Oh my God.

Michael Roesslein:

But then you find something that does and it's super fun and it's worth it. And I mean yeah, that was early 2015, I think, is when I...

Yeah. That was early 2015, I think, is when I met you guys. And it's been five years of chaos. So you mentioned you found these bacillus organisms, you liked what they did, you put the formula together, nobody wanted to buy it, so you guys made it. Can you tell me a little bit about what they do?

PART 1 OF 4 ENDS [00:23:04]

Kiran Krishnan:

Mm-hmm (affirmative).

Michael Roesslein:

What were the main attributes that you saw in I guess the strains that you chose that were like, "Okay, we need this one, we need this one, we need this one?" You said that it made changes to the microbiome in a positive way versus trying to flood the microbiome with new organisms. It made changes happen that were important without trying to just bucket load as many organisms in there as possible. So positive changes, but what were the changes that really stood out to you that you were seeing in the research and were like, "We need these?"

Kiran Krishnan:

Yeah. So what we knew about bacillus endospores in general and their use in the pharmaceutical space, that was a big part of our influence, right? So since 1952, there's been a couple of big brands of bacillus endospores probiotics in the market, but all is prescription products. And this has been in Europe and Latin America and so on. And the main use for them is they were using them as a treatment for dysentery and other gut infections, right? So these spores had the capability of going in, doing that quorum sensing, reading the microbial environment, and they have this intrinsic intelligence to understand what microbes are there that are overgrown and potentially causing problems, right? So then they will sit and basically surround those pathogens that can produce up to 25 different antibiotics and antimicrobials, and they will compete in other ways and bring down the growth of these infectious pathogens, right?

So that was the thing that really stuck to us, because what that says to me is that if these bacteria have an intrinsic knowledge of what shouldn't be there, right, and then have all of these tools to go after what shouldn't be there, that they may also be able to then enhance the growth and the functionality of what should be there, right? So the pharmaceutical industry had really taken advantage of their ability to find and get rid of things that shouldn't be there. We said, "What if we can enhance the growth of things that should be there and fix this idea of dysbiosis?" Right? Because part of the problem is that, and we knew this early on and I think we still know it now, most people who study the microbiome know this, is that it's really hard to tell what's wrong with each individual's microbiome, right?

If you're experiencing symptoms of loose stools and food intolerances and so on, the reasons for it at a microbiome level may be different in your case than it is in my case, right? It's not always the exact same reason from a bacterial standpoint. And that's because everybody's microbiome is different. So then the question is if we can't figure out, from your perspective, what exactly is a bacterial dysfunction in your case and in my case and so on, then how do we go in and tinker around with your microbiome to fix it? So the idea was that these spores somehow had this universal knowledge of what the microbiome should look like, what is problematic, and we hypothesized that they could also improve what should be there at the right amounts. And so that was the whole concept was like, "Okay, if they can go in and fix the dysbiosis, then there's lots of stuff that can get impacted by that." You'll see some of that by the newer studies.

And so right away, we said, "Okay. What would be the most important measure if the spores could go in the gut and actually fix that dysbiosis? What would we want them to fix?" Right? And so right away, leaky gut popped into our head. We said, "If the spores can alter the microbiome enough, where they can actually fix leaky gut, that becomes a key thing that we want to study," and that's why we started our first big clinical trial with leaky gut and published that in 2017. So what exactly do each of the spores do that led us to the idea that they might be able to do this? Number one, bacillus subtilis, which is one of the main strains in the formula, is a powerful, competitive exclusion bacteria. It's so good at going in and reading the environment, finding problematic or pathogenic organisms, sitting next to it, and bacillus subtilis alone can produce about a dozen anti-microbial compounds to bring down the growth of other pathogenic organisms.

And so, the idea is that, "Okay. Bacillus subtilis, here's a commensal bacteria with this competitive capability. It can bring down all of these other organisms." And then there was also some studies that had shown that some of the compounds it produces like subtilisin, actually enhances the growth of some of your commensals. So that was the first microbe we wanted it in there. We said, "We need this microbe that seems to be the orchestrator of the microbiome," right? That was a really important factor. And so we started the formula with bacillus subtilis and we wanted a really powerful bacillus subtilis. Now, one of the ways you measure the powerfulness of a subtilis is how well it colonizes on a plate that has lots of other bacteria on it, right? Can it bump out and beat out a lot of other bacteria? Does it produce biofilms because most of your commensal bacteria are protected in biofilms? So we found this particular subtilis to be able to do all of those things.

We also found some really interesting aspects of it early on that this particular subtilis produce unique compounds. For example, neurotransmitters. We still haven't defined that exactly in terms of quantifying it and all that, but we'd saw that it produces all of these postbiotics that seem to impact the growth of other microbes, right? So right off the bat, here is your orchestrator type of species. Now, the other thing that's important to help the bacillus subtilis is the pH of the gut. So we wanted to use a spore that is well known for producing L+ lactic acid and bringing down the pH of the gut because that facilitates a good bacteria growth and makes it harder for bad bacteria. That's where coagulants comes in. So coagulants was selected because of its ability to produce lots of L+ lactic acid, acidify the gut, make bacillus's job a little bit easier. And then also, start warding off some of the other problematic bacteria.

And so then one of the other changes from that is as you increase lactic acid production, you will also increase short chain fatty acid production, because lactic acid is a primary precursor to other short chain fatty acids, right? So the idea there is not only is the coagulants then going to help the bacillus do its job and it's going to ward off some of the pathogenic or competitive microbes, including fungus because of its acidification of the gut, but then that acid that it produces is also a precursor to really important gut healing compounds like short chain fatty acids. So that already fit really well together. Then we really like clausii because Enterogermina, the drug that has been out since 1952, has studied clausii effectively. And what they've shown is that clausii has this amazing capability of modulating immune response in the mucosa itself. You see that in the upper respiratory mucosa and in the gut mucosa. And so that is really important because that facilitates repair of the barrier, so we needed clausii in there.

Clausii became really important. And then we found the discovery of these new strains called [inaudible] indicus, which is a carotenoid producing strain. That's what's really unique. We're the only ones in the world that have this indicus strain and this was part of a €6 million research project that was done in Europe, headed up by Simon Cutting, where they were discovering these rich carotenoid producing strains.

Michael Roesslein:

I think you guys didn't have to pay for that.

Kiran Krishnan:

We didn't have to pay for that all. Thank goodness. Yes. A big food company actually paid for all of that.

Michael Roesslein:

Stumbled upon somebody else's work. Thanks guys.

Kiran Krishnan:

Totally. And here's the beauty of it. The big companies that actually funded that research were then going to Cutting trying to gain exclusive access to the strain, right? And we appealed to him from the science side. We talked to him about all of the research that we can do, how we understand this and all that. So we got the opportunity where he actually decided not to license the strain off to the big companies that actually funded the research. Instead, we got the global exclusive license to that strain. So that was a fundamentally important moment in the birth of MegaSpore, because MegaSpore would not be the product it is without that indicus HU36, right?

And the reason for that is it produces 12 different carotenoids at RDA levels in the gut once it gets there and colonizes. Now, why is that important? It's because we understood at that point that oxidative stress is one of the big drivers of damage in the intestines. And as the intestines continue to get damaged, it becomes harder and harder to repair. We also knew that these types of carotenoids can act as prebiotics for other important bacteria within the gut, right? So this strain became a critical strain to be able to achieve things like fixing leaky gut and reducing inflammation in the mucosa and so on. So we threw that strain in there. Licheniformis, which is the fifth strain, is a strain that's been used in Russia and a bunch of Eastern block countries as prescription drugs, again, for gut infections.

And one of the main reasons it's used is because this particular spore produces bacitracin as an antibiotic. Bacitracin is a really good antibiotic against certain types of gram negative pathogens, right? And so it's a powerful, competitive exclusion bacteria. And we said, "Hey, lots of people with gut issues have this gram negative dominance in their gut and they have all of these gram negative type pathogens in their gut. We need this Bacitracin being produced in there to bring those down." So that's how Licheniformis got added in. So that's how, at a high level, we formulated the product and we put these particular five strains together. They each play a very unique role and together, they have all of these really profound effects.

Michael Roesslein:

So the subtilis is the boss.

Kiran Krishnan:

Yeah.

Michael Roesslein:

And I guess I was going to compare it to one of the Beatles, but I've learned not to imply that a certain Beatle is the leader of the Beatles, because-

Kiran Krishnan:

Oh, people get mad.

Michael Roesslein:

Yeah. Wow. There's one Beatle that I always just viewed as the leader.

Kiran Krishnan:

Yeah.

Michael Roesslein:

And-

Kiran Krishnan:

We won't say who is [crosstalk]. John Lennon, yeah.

Michael Roesslein:

Yeah. Well it's definitely John Lennon.

Kiran Krishnan:

Mm-hmm (affirmative).

Michael Roesslein:

But then people get offended. But in the spores, the subtilis is John Lennon.

Kiran Krishnan:

The absolute much. Yeah.

Michael Roesslein:

And you complimented them well with the others. So that's the, "Why," behind the formula. And then the results you guys got... Some people here know my mother-in-law was the first person that I gave them to who wasn't even my mother-in-law yet. It'd be safer if she was. This was just-

Kiran Krishnan:

Right.

Michael Roesslein:

A lady who I'd never even met, whose daughter I was dating. And I was like, "Well, I'm going to give this a try." And she has Hashimoto's and Crohn's digestive issues. And she also had severe pet allergies and asthma and that. But that wasn't even on my radar of what I was suggesting it to her for. I gave it to her and then a couple of weeks later, I'm like, "How are you feeling?" "I think I'm feeling pretty good, but I went to my friend's house and they

have a cat and I didn't have an asthma attack. Can that be related?" And I thought, "Probably not." And then she was so reactive that... She's a therapist, and if her clients came into the office with a lot of cat hair on them, she would start having an asthma attack.

And then she came to our place in Arizona and pet my dog and was able to be around the animals. And she said, "This has to be that, I didn't change anything else." And that's when I called your office and was like, "Hey, can someone tell me what's going on here?" And they gave me your number and we talked for a couple hours one random afternoon. And I was like, "Man, I usually can't get someone on the phone at a supplement company who can tell me..." Honestly, most companies, I can't get somebody on the phone that can tell me a single damn thing about any of their products. Nothing that it doesn't already say on the label. They just read the label to you as if-

Kiran Krishnan:

Totally. Yeah.

Michael Roesslein:

It's insulting. And so my understanding of it then was immense and I was like, "You got to come on a webinar and we got to talk about this." And then that webinar went crazy and then we did a thousand other webinars. So that's out of our story. And then people started emailing me and wanting it and sending me stories, "Listen to this," and, "This happened. And then they would go in their Facebook group of whatever condition they had and say, "Hey, I tried this and this worked." And then I get 40 emails from those people and then I was the most popular guy in a IBS Facebook group for a while, and then in a SIBO Facebook group for a while, and then in a histamine Facebook group for a while. And then that's where the Rebel Health Tribe original core group came from, was all of these types of chronic illness Facebook groups. And then the stories that we've heard since then, I've lost track of. I don't know, there's been too many.

So that was just general research that you had found on these specific strains and organisms. You hadn't formulated it yet. So you hadn't run many research specifically on MegaSpore as a formula.

Kiran Krishnan:

No.

Michael Roesslein:

You guys only started doing that a couple years ago because that's not easy to do or cheap or any of that.

Kiran Krishnan:

Yeah. Well the first one we started was in our first leaky gut study, which published in August 2017. We had actually started that study at the end of 2015.

Michael Roesslein:

Is that with the college kids?

Kiran Krishnan:

That's with the college kids. That's the one at University of North Texas. And that was a big push of mine, right? I mean every time we kept looking at the bank account, I'm like, "Okay, I need to gather enough money to do a study." And the thing is, I came from the study world, right? So I could have done a study. I could have designed one and run it. But I knew that if there was going to be any credibility to study at all, we had to do it at an outside

institution. And we were doing small case trials ourselves with Tom's clinic and his patients and getting some clinical feedback on-

Michael Roesslein:

Yeah, but people want to see from an organization that's not you.

Kiran Krishnan:

They need to see it, exactly. And totally reasonable too. I trust studies from an institution way more than I do from a company doing it internally themselves.

Michael Roesslein:

Yeah.

Kiran Krishnan:

And we wanted it published and it's much harder to publish it if you have a major conflict of interest with this study and there's no other party involved that it would be non-subjective. And so we wanted to do an institutional study. Now, the beauty of it is because I had been in the research world for so long and I had made connections in the university world, we had this cool deal with University of Texas System where we could pay for a study over time and the university would provide the researcher grant to do the study and get it done. The study would be finished, we'd get the data, they would submit it for publication and we could then pay for that study over the next two, three years and with no interest, right? Just making monthly payments.

So once we set that up, once we got to a point where we could afford a reasonable monthly payment, I said, "We got to start a study." That's a number one thing. And so in 2015, this was in our... So 2013 was our first year, '14 was the second, in our third year of business, and at this point, which is right around when we met, like you said, we still only had four or 500 active clients. We didn't have a whole lot of revenue, but we said, "We're committing to this monthly payment and we got to get this study started." So that was our first study that we started in 2015. We didn't do any others until that was done and started to get published in early 2017. And then starting in early 2017, we started kicking off the clinical trials. We were going nuts, and we had, of course, the revenue to support it and we just invest so much of our money in research.

Michael Roesslein:

Now you've got the lab in-

Kiran Krishnan:

Sacramento State. So we do some really awesome high level bench top type of work, which is really important. And I just want to give people a quick overview on studies and trials. The gold standard is to have many different kinds of trials, right? So human trials ultimately are the most important ones because that shows the effect in an actual human. But mouse studies, model studies, in vitro studies are all really important to understand mechanism of action, right? And in fact, a lot of those will prove the human outcome studies, right? So when you're writing a grant or when you're actually writing a paper for it to get published, if you're supporting the mechanisms of your conclusion with other studies that have already been done in this space, even if they're animal studies or in vitro studies, it gives a lot more credibility to the outcome, right? So one of the gold standards of you take this product, it has this effect in humans, is how do you explain the effect? If you cannot explain the effect, then that has less scientific credibility.

And so in order to explain the effect, you need mechanistic studies where you need animal studies and you need cell culture work and so on, so you can dig down into the mechanism of what's actually going on. So that's how we do things. We like the human studies first almost. We go for, "Let's see if there is an effect. And if there is an effect, then we back up and go do some animal studies to try to figure out the mechanism of action."

Michael Roesslein:

That makes sense. I've learned a lot about studies just from doing so many of these webinars. I had to read and write reviews of research studies in grad school because my master's is exercise science and physiology. And by the time I was done with that degree program, I never wanted to read another study again. I just hated even the format when it would pull up on the screen. And I would just, "I don't want to read that." And so I blocked it out and then I got reacquainted with them through these webinars. So that's the formula for original leaky gut study, and you said you have five new studies.

Kiran Krishnan:

Mm-hmm (affirmative).

Michael Roesslein:

You don't have to go into the full breakdown of each one of them, but what are the five... These are published now? Can you talk about them? Or are they-

Kiran Krishnan:

Yeah, because we actually have 12 completed studies right now. But it takes time to get them published. That's part of the process.

Michael Roesslein:

Yeah, and there's limitations on what you can talk about until they've been peer reviewed and officially published, right? Yeah.

Kiran Krishnan:

Yeah. So we actually have 12 completed studies, five of the 12 have recently been published. So the five I'm going to show you, and I'll share a screen if I have the permission to do that, and then-

Michael Roesslein:

Yeah, sure.

Kiran Krishnan:

Show you the studies. I'm not going to go into painstaking detail, but it just paints a picture of all of the functions of the probiotic, right? So let me pull that up. Oh, okay. I think you have to enable participant sharing.

Michael Roesslein:

Weird. All right. [crosstalk] I think I did it.

Kiran Krishnan:

Okay. Let me try it again. Okay. Yeah, you sure did.

Michael Roesslein:

And you use whole screen, I think.

Kiran Krishnan:

Yeah. All right. Can you see the whole thing?

Michael Roesslein:

Yes.

Kiran Krishnan:

Yeah? It's a full screen?

Michael Roesslein:

Yeah.

Kiran Krishnan:

Oh good, okay. So this is the first of the five studies. This was published this year... Where's the date? February 2020. So this is very recent. One of the lead researchers is Dr. [inaudible]. He's a gastroenterologist and he's got a number of... So he actually has an IBS study on MegaSporeBiotic published as well. But that was published last year, so I didn't include it in this list. But this is a really interesting study because one of the areas that we are very focused in with MegaSpore is on liver health, right? And why are we focused on liver health? Well, if you look at the pathophysiology of lots of different diseases, the liver is at the central role of a lot of those things, because when you think about things that enter into the body and have a certain degree of toxicity, the organ that takes the brunt of a lot of that is the liver, right?

And so one of the epidemics that we have going on in the Western world is nonalcoholic fatty liver disease and nonalcoholic steatohepatitis, right? Both of those have now far surpassed hepatitis cirrhosis and alcoholic cirrhosis of the liver. For the longest time, people who were going to liver failure were people that had either hepatitis or had alcohol cirrhosis. Now those are minuscule compared to the nonalcoholic fatty liver disease and the nonalcoholic steatohepatitis. That is important because that liver dysfunction is also at the root cause of so many other bigger conditions. Take diabetes, for example, obesity, so metabolic syndrome, right? Cardiovascular disease, inflammatory bowel disease, various forms of cancer. All of these things have this liver as a linchpin of where things become dysfunctional.

Now, we also believe, and this study should support this, that the gut dysbiosis and leakiness in the gut and endotoxemia is the biggest driver of why livers become dysfunctional, right? Nonalcoholic fatty liver disease and nonalcoholic steatohepatitis are driven by endotoxemia. So leaky gut, right? So...

[inaudible] by endotoxemia. Leaky gut, right? We did our first study on leaky gut. Now we have a second larger study on leaky gut going on right now, it got held up because of COVID, but it's going to start up again in the fall. But we said, okay, we already know we can resolve leaky gut, now let's get into the other parts of the pathology and see if we can improve those things directly.

First thing we wanted to study was liver injury, can the megaSpore protect against liver injury, which is what's going on in so many conditions right now. Here's the thing, SIBO, SIBO'S driven by liver injury, right? It's something like seven 65, 70%, of people with fatty liver disease will have SIBO compared to only like three or 4% of non-liver dysfunctional people who are age match. At the root cause of even digestive issues like IBS and SIBO, is liver dysfunction, right? That's a big part of what we want to study.

This is a mouse study because you can't do this kind of study on humans, but what they do is they induce damage into the liver by overdosing mice with acetaminophen. When you go overdose on the acetaminophen it causes a very frank toxicity to the liver. And so what they did in this study was they pretreated the mice with MegaSpore, or pretreated them with [inaudible], and [inaudible] in western Europe and all that is an actual prescription product for liver [crosstalk].

PART 2 OF 4 ENDS [00:46:04]

Michael Roesslein:

It's milk thistle extract, right?

Kiran Krishnan:

Milk thistle, exactly, yeah. We wanted to compare it to that to see the effects are similar. And then of course, placebo where there's no protection. Basically what they found was that the probiotic, the MegaSpore formula, when you preacher to the animals with that, and then you overdose them on acetaminophen to try to damage their liver, offered exactly the same level of protection, which was very significant, as milk thistle does to the liver. That just shows you how probiotics, if they can affect the rest of the microbiome, if they can stop the leaky gut, if they can stop toxicity, if they can improve the repair mechanisms in the body, it can protect organs even peripheral to the gut. That's one of the things we want to show.

This [inaudible], milk thistle, has been so well studied as having hepato-protection properties to a point where this particular compound that we use is prescription drug to do that. And the probiotics protected the liver just as well, a hundred percent just as well. When we looked at liver enzyme function, when we looked at a [inaudible], we looked at all kinds of things, and then because it's a mouse study they can also sacrifice the animals and do histology of the liver. They found that it completely protected the necrosis of the liver that was seen in the placebo group, and protected just as well as milk thistle does.

This is the kind of layering of research that we want to do to show that when you take a product like MegaSpore, you're not just improving gas and bloating, or making things change within your gut, you're actually slowly protecting all of the other organs that are influenced by the gut. This was a very important study. Now, we wanted to then further verify this kind of mechanism, but using humans, right?

One of the ways that you study damage in the liver, because, with humans, we can't purposefully damage the liver, right? We can't get humans and give them an overdose of acetaminophen.

Michael Roesslein:

If I'd only known you about 10 years ago, I'd have had a liver that you could [crosstalk].

I actually just had an ultrasound because I have hemochromatosis and one common symptom of that is liver damage. And four years ago they wanted to do an ultrasound on me and I had nonalcoholic fatty liver disease. I had what they called moderate, which knowing the standards, and what's average, and what's normal in the U.S., I would guess moderate is actually pretty advanced. And I just had another ultrasound last month and it's clear.

Kiran Krishnan:

Fatty liver is gone.

Michael Roesslein:

I've taken milk thistle and other liver supportive things, but I've been with the spores for four years too. I didn't have any idea that I was also working with that. But yeah, I got an all clear on my liver.

Kiran Krishnan:

That's awesome. That's so important because more and more studies are coming out that nonalcoholic fatty liver disease is at the root cause, or early root cause, of so many chronic illnesses, right? Gut stuff, brain stuff, emotional stuff, everything, auto immune conditions, all of that, the liver is so important. And if your liver is not functioning, the rest of the system breaks down quite easily.

Now, because we can't induce toxicity in the liver in humans, one of the ways of studying people with liver dysfunction that are not hyper sick, so we're not studying end stage liver people just yet, we wanted to look at people with elevated triglycerides, right? If you have elevated blood triglyceride levels, that's indicative that your liver is going through a lot of toxicity. Typically elevated triglycerides follow certain metabolic pathologies, follow people who have nonalcoholic fatty liver disease, [inaudible] hepatitis, and so on.

In this study, that was published ... Should flip here. I think many people will be familiar with Dr. Stephen Sinatra, he's a very well known integrative cardiologist in our world. This was a 90 patient study for 90 days, and what we were able to show ...

Michael Roesslein:

No relation to Frank.

Kiran Krishnan:

No relation to Frank. From a science standpoint, though, he's a Frank like kind of guy, he's that cool.

Michael Roesslein:

Got you.

Kiran Krishnan:

This is the basic study. In the placebo group, in the control group, and these were people with elevated triglycerides. Over 200, right? And then the 90 day study, and they weren't on any other medications for triglycerides at this point. And in the placebo group, as you can see, it's basically a flat line, slight increase, but the standard deviation is high enough that we can't really say it's an increase. Basically unchanged.

Then you see the spore treatment group, at a six week period, halfway point, we saw a huge, significant change from just around 215 average triglycerides down to about 160. Now they're back in the normal range. And then it actually went down on average to 150 or below. It's an amazing change in total triglyceride levels, right? You cannot achieve this level of change with anything in the prescription world. And so this is a really fascinating look, that even in humans, we can bring down the triglyceride levels over time because primarily we are effecting the liver in a positive way. As the liver becomes less impacted, less toxic, you start to see the triglyceride levels come down.

Now, why did we think this was even possible? Well it's because in our first leaky gut study, in our 2017 study, we happened to measure triglycerides. And the average starting triglyceride was in the 150 range. And in those people, even at 150, we saw 28% reduction in triglycerides, right? Even in people without elevated triglycerides, we saw it come down. That was really exciting to us. We said, okay, can this happen in people with elevated triglycerides? And sure enough, it did. This adds to the liver story.

Then we have another liver aspect of it, and this is study in people with end stage liver disease. The end stage liver disease is called hepatic encephalopathy. We just published this ... Let's see where, June of 2020. This just published just about a month ago. People who have hepatic encephalopathy means they're in end stage liver disease. They are either on something called lactulose, which is a synthetic sugar to keep blood ammonia levels down. The reason is, just to explain this for people, the livers job is to clear ammonia from your system, from your gut. The ammonia is going to be produced inevitably from diet, from eating especially protein. When ammonia is produced, the liver is supposed to clear it out. If you are in end stage liver failure the liver cannot clear it out so you end up getting higher blood ammonia levels.

If ammonia levels in the blood increase too much, you get something called encephalitis, which swells the brain and then you can die very quickly. These people are very tenuous and they're not doing really well. And when they are on this synthetic sugar, lactulose, it's been shown to be able to reduce blood ammonia levels. But then there's all of the side effects. You get chronic diarrhea, you've got 12 to 15 bowel movements a day. It's not a really good quality of life to be consuming this every day. Or they are on Rifaximin every day as well for the rest of their life, for the most part, depending on their condition.

We said, okay, we know that the subtilis, this is our subtilis. We know that the subtilis can bring down ammonia levels in the gut, right? We said, in these end stage liver patients, can we use the subtilis, number one, to prove that it's safe and it's tolerated very well, even in these very sick people? And the number two, that it actually can help bring down blood ammonia levels in the people with highest levels of blood ammonia. And sure enough, what we found was in an eight week period, we were able to get a very significant reduction in blood ammonia, and it was very safe, and very well tolerated.

And this was a very high dose. We started with 5 billion CFUs, and then we actually went, for the last four weeks, went up to 10 billion CFUs just to see how people tolerated it. And in fact, most of the patients that ended up ... Once you un-blind the study, most of the patients that ended up on the therapeutic dose actually requested that we continue them on the therapeutic dose because they had all of these amazing quality of life changes, right?

Our focus is leaky gut first. Can we stop leaky gut? Yes, we know we can stop leaky gut. Now, can we protect other organ systems? Can we protect the liver? Which, to us, is the biggest thing. Sure enough, we saw in the animal study that we can and we've worked through mechanisms in the animal study. Now in two separate human studies, one on triglycerides, on what would be considered kind of healthy people because they're not sick in this same stage, we can bring it down quite a bit. And then even in people in dire situation, we can improve liver function, bring down, in this case, blood ammonia. Those are the three kind of liver studies that just kind of hit one after the other. This kind of starts giving you an idea of how broad of a spectrum the effects of this probiotic can be.

Now, another really interesting study that we've been trying to get done, this is a combination of our bacillus subtilis and bacillus coagulates, [inaudible]. We just published this July. This is the most recent published study, July 7th. I just finally got this copy from the journal. And what we were looking on doing ... And this is in the [inaudible] model. This isn't that full synthetic gut model system, right? Because again, it's harder to do these kinds of studies in humans. What we wanted to see is what are the kinds of damages that occurred to a healthy microbiome when you use a course of antibiotics and can the spores reverse that damage?

What is really interesting about it is not only do we see my microbiota damage, when you use antibiotics, it actually increases the permeability of the intestines, even in that same seven day course, quite dramatically. And then that intestinal permeability is highlighted by all kinds of cytokine and chemokine release, including things like [inaudible 00:00:58:12], TNF [inaudible]. Inflammatory response in the gut and then systemically increases dramatically because of the antibiotic use. And what we found was that when we treated the gut, after antibiotic exposure, after damaging it, and after being able to measure the permeability is increased, the inflammation is increased, in just two weeks of treatment with the spores, we were able to reverse most of that damage.

Now, this is the in vitro study to prove out the mechanism. And we go [inaudible], of course, in this paper, we go through all the details of the mechanism of how it all works. But what we wanted to prove out first from a mechanistic standpoint is at the intestinal lining level, at the bacteria level, that the spores have a reversal impact on all of the damage that an antibiotic does to the gut. This is another way of studying dysbiosis in the gut, right? We're proving that.

And next phase would be, we would do something similar to this, but in humans where we would take humans who just undergone a course of antibiotics, and hopefully catch them before they start the antibiotic, do some measures on them, do some measures after the antibiotic, and then see if we can repair those measures in the human study. We'll be doing that moving forward.

And then here's another really interesting study, this was a research that was done at Cleveland Clinic by Dr. [inaudible] and her team. This was a study to show that the spores can compete with C diff, infectious C diff. This is a mouse study. They were able to infect mice with C diff. They in fact, used vancomycin to make the mice more susceptible to C diff so it damages the lining of the gut even more than the mice get infected longterm with C diff. And then we use the spores to try to see if oral administration of the spores will get rid of the C diff infection. And what they found was not only do the spores surround the C diff bacteria, and compete with it, and get rid of the C diff bacteria, but the spores also enhance the immune response against C diff. It is supporting your immune system to recognize and go after C diff, on top of directly competing against the pathogen itself.

This is a really interesting study, and again, done it one of the most well known research institutes, Cleveland Clinic, because this gives us the precursor to a human C diff study. And then it also sets us up for studying other pathogens in this area as well. Just when you think about just these five studies that were recently published, think about the breadth of function of this one product. We're talking about really Frank competitive exclusion of a very common, well-known, difficult gut pathogen. Their ability to fight against that kind of gut pathogen, and then repair the damage to the pathogens done, and then also enhance the immune response against the pathogen.

That immune modulation, we've seen three studies on the ability to protect, and serve the liver, and then all of the beneficial outcomes from that. And then of course, other damage to the gut, like for example, caused by antibiotics, it can reverse that damage, improve the permeability dysfunction that occurs, and bring down the inflammatory response that was caused by the antibiotic damage to the gut.

We've got a bunch of other studies coming out, but this just kind of shows you what we do as a company.

Michael Roesslein:

How do you keep track of all of this going on at the same time?

Kiran Krishnan:

It's crazy. I let things slip through the cracks so much. I just had an email from someone today, like, "Hey, where does that one form for this study?" And I was like, what study are they talking about? Oh, crap, we're doing a study on that. I totally forgot we were even doing it. But thank goodness for people like [inaudible] and other team members that help keep things ... Because I'm really quick and good at kind of coming up with the studies. I know who to work with on them and get it started, and then I kind of move on to the next one. And fortunately, I have a good team that [crosstalk].

Michael Roesslein:

She's a rock star.

Kiran Krishnan:

She's a total rock star. Fortunately, being able to bring on people like her to be able to help me keep everything straight.

Michael Roesslein:

Yeah, man, this is all madness. I didn't know any ... I knew one of these, but I didn't know about the other four. And the liver stuff is crazy. The antibiotic repair is crazy, the triglycerides ... I would never even think to look at probiotics for those things.

Kiran Krishnan:

Right, yeah.

Michael Roesslein:

I want to write up blog posts on these. I want to write up blog posts where we explain not only what happened in this study, but the relevance of it.

Kiran Krishnan:

Right, what does it mean.

Michael Roesslein:

Somebody could read the headline and I could say like, oh, it reduced this and this and this, but what does fatty liver mean? Nonalcoholic fatty liver disease is so prevalent in our society now. I mean, there's thousands and thousands of functions of the liver and we still don't really know half of what it's doing, probably.

Kiran Krishnan:

Totally, yeah.

Michael Roesslein:

And so people don't realize that liver's the gateway to thousands of biological processes, storage of various nutrients and vitamins, and hormones [crosstalk].

Kiran Krishnan:

The formation of things like bile and other nutrients.

Michael Roesslein:

They just think detox alone, but it is the headquarters of the body, essentially, of the most processes. That's pretty amazing.

Kiran Krishnan:

Imagine if you lived in a house and the sewage system of the house stopped working, right?

Michael Roesslein:

I wouldn't want to live in that house very long.

Kiran Krishnan:

Right. How soon would you not be there anymore if the toilets didn't work, the drains didn't work, none of that stuff that kind of cleans out the house and allows you to carry on in a pleasant place. If none of that stuff worked ... And that's one of the key things of the liver, is if the liver stops working ... The hepatic encephalopathy people, what really interested us in them is, you look at them, they don't look necessarily sick, they look, for the most part, kind of normal walking, talking people. But their livers are end stage, which means if they have a few grams too many of protein, they could die like this.

And during our study, that we were doing, one of the participants in the placebo group actually passed away kind of out of the blue from brain swelling. That's how tenuous your condition is when your liver stops working the way you think it should.

But yeah, these are the studies. We were so excited every time these publish. People don't really grasp the work that goes into putting these together. How many times we had to rewrite this paper, submit, go through peer review, answer all of their questions. Just provide them more and more information. When you see a paper like this, for the most part, people kind of glance through it, maybe read the abstract for a few minutes, but this is just months, and months, and months of work, to do all of this stuff and put it out there and add to this collective science, but that's what we do. We're focused and committed to that.

Michael Roesslein:

You guys are hardcore nerds, man. And I mean it in the greatest possible way.

Kiran Krishnan:

The biggest.

Michael Roesslein:

This is pretty amazing. And the only thing left I had to ask was ... There's a lot of questions I'm going to just roll into one little conversation is around dosing. I don't have a bottle in front of me, but I think on the bottle, it might just say two per day. And we have it on our site, on our blog, there's a comprehensive post on MegaSpore that's pretty much everything that existed then, which we need to update with all of these new studies. But we recommend, generally, people, if they know they're sensitive to products, and supplements, and probiotics, and things, or they know they have infections, Lyme disease type people, or other types of infections, we recommend people start at one cap every other day and kind of go up to two caps a day from there, gradually. Is that still your kind of standard titration up for ... A lot of people can just take the two and it's fine, and it doesn't have any effect, but we have a pretty sensitive audience.

Kiran Krishnan:

Yeah, and one of the things we found is it became really hard to tell who would be sensitive to it and who's not. Some people who you think like, oh, they're very sensitive to everything, they're going to have a harder time, they would start with a full dose and be totally fine and other people would be a surprise to us. We just taper everybody up. We start everybody with one cap every other day, the first week. And then you go to one cap per day, the second week. And then finally two caps per day. And you always take it with food. And when you get to the two caps, you take the two caps together.

Now, there are lots of people, in the past, that we've started with even lower of a dose. Instead of one cap every other day, we might go half. Or some cases, in a rare case, we might go quarter depending [crosstalk].

Michael Roesslein:

We've seen that in some really sensitive people.

Kiran Krishnan:

Yeah. And some people, it might take them three, four months to build up to a full dose. And that's totally fine. Because remember, like you saw in the studies, the spores are going in and they're making a fundamental change in the gut. And that kind of change in the gut, especially as they're battling dysfunctional bacteria and so on, those changes can present with [inaudible] type of response, die off type of response. And that can be uncomfortable for some people. And so we just say, taper it up slowly.

Let's say you start with one cap, your first cap dose, you're like, okay, I feel okay. And the day after you take another cap dose, then all of a sudden it's a little too much for your system. You're cramping a little too much, or whatever the response may be, then the next dose just go to half a cap, and then stick with the half a cap every other day for a week or so, and then bump up again. Every time you bump up, if it's too much, you can always just bump back down and go a little bit slower.

Michael Roesslein:

And we've told people that, generally, just after a meal with significant protein is ideal, but that it's not essential. But that's kind of the best time to take it. The proteins do something, or the meal does something to activate the spores.

Kiran Krishnan:

Yeah. The spores, in particular, love an amino acid called alanine. If there's any alanine in the diet, and if you eat any kind of protein, there'll be some alanine in the diet, and that's enough to really ...

Between, there'll be some alanine. That's enough to really activate the spores. They also like some sort of fermentable or carbohydrate of some sort. So most meals will have enough of both of those things to activate the spores. You don't have to do a special protein shake with 30 grams or something like that. Even things like nuts will have enough alanine in it to be able to activate the spores. So we just say, eat, take it with food.

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Michael Roesslein:

Okay.

Kiran Krishnan:

For the most part.

Michael Roesslein:

And yes, they can be taken out of the capsule and put on food or in a drink or something. They do survive. The stomach outside of- the capsule itself will get dissolved in your stomach acid. I'm almost entirely certain of that. So then they're loose anyway. So for kids, people often sprinkle them or people who have a hard time with pills, or don't like to take pills.

Kiran Krishnan:

There's two other times where I recommend to people to specifically take it out of the capsule. One, is if you feel like you've eaten something, you've got a bit of a gut infection going on. Right. And the reason for that is what I like to tell people to do is open it up, add it in water and just mix it around, and then sip it. Part of the reason is because, if you've got an infection somewhere and you got food poisoning, when you take the capsule and the

capsule goes in, it sits in one place and it dissolves in that one spot. And then the spores kind of have to move around. And that may take time for the spores to move around in order to bump into or find the pathogen that's causing a problem.

If you're not feeling well and you want quicker relief, if you drink the powder, it coats the gut a little bit better. So you get a better distribution of spores throughout the gut. And that's what I tend to do for people that think they have food poisoning, or what I've done when I have food poisoning.

Also, the other problem is it's really hard to eat anything, right, when you have food poisoning. Or even swallow something that is even of that size, if your gut is really sensitive. So mix it up in water and just kind of slowly sip the water, and it's fine. The other time is if you have oral issues. If you have periodontal disease or bad cavities, or you've got some degree of gingivitis. You put it in a little bit of water and then you swish it around and you hold it in your mouth. And we're actually going to be starting a study on this specifically, but we've seen some evidence from people who do this, that it actually improves some of the immune response. Provides you a healthier immune response, and it supports that in the gingival tissue around in the gums.

Michael Roesslein:

Okay, good to know. Yeah, we definitely need to update our posts. So that would be- that's dosing, that's best uses. I'm going to hit a few of the questions. We have a lot. I'm going to try to condense some of them that are similar into one answer. Do you have a specific antibiotic protocol? What was the protocol used in the study? I know that you have one for C. Diff with your guys' company that you recommend to the practitioners with more than just MegaSpore, and then the antibiotics as well. Is that something you're comfortable sharing?

Kiran Krishnan:

Yeah. If people have been on antibiotics, typically what we tell them to do is take two MegaSpore a day, take two HU58, and take to RestorFlora. So you do that morning, afternoon, evening, right? And it doesn't matter which order you do it in. So you can do either one at any time. If you are on antibiotics at the moment, or you very recently in the last couple of weeks taken one, and you weren't doing anything during the antibiotic to prevent any further damage, we have people do that for somewhere around three to four times longer than the course of the antibiotics were. So if you had a seven day course of antibiotics, you do that for 21 to 28 days.

Now, the other time we do that exact same protocol is if someone has had all kinds of recurrence C. diff, so they've got this tenuous gut. If you've got an active C. diff infection, work with a doctor, go to the hospital. This is not for an active C. diff infection. This is for somebody that has a history of it, and it's currently in a remission state, not a recurrence of C. diff. So in that remission state, in the non recurrent state, you're just trying to improve the bowels. Then we do the same thing. Two MegaSpore, two HU58, two RestorFlora. Do that one in the morning, afternoon, and evening.

What we use for the study and the antibiotics was actually just two of the MegaSpore's strains, the HU58 and the coagulans. We just mix those two at the doses that they're in MegaSpore. And we use it in the shine model for that. Part of the reason is because we feel like the coagulans and HU and the subtilis are the two main things that are going to repair the microbiota component of it. And since we weren't studying broader things, we didn't bring in the other strains. We wanted to see what would happen with just these two strains.

Michael Roesslein:

Okay. That makes sense. And I'll try to get that written somewhere, because I've emailed you guys five times every time somebody asks me for it, and then I've never wrote it down somewhere. I can remember. Okay, for SIBO patients we've said on our end, we've had pretty mixed. Some SIBO patients do totally fine with it, and actually the SIBO group was one of the groups that they found a probiotic that didn't make them all sick. And so they flooded

it. And I'd say two thirds of the people from the SIBO group had pretty positive results. Others were really, really sensitive, likely due to the fact that they have organisms where they don't belong and it's causing a reaction in a place that could cause discomfort.

Kiran Krishnan:

Small bowel, it's a battle going on.

Michael Roesslein:

Yeah.

Kiran Krishnan:

People would see real severe, small bowel dysbiosis, lots of gram-negative growth. So you're going to a lot of LPS release when the spores go in there and try to fight those bacteria. So you just have to kind of go really slow with it. Ultimately it's going to be the thing hat helps fix the underlying dysfunctions that lead to SIBO. For example, liver dysfunction is a major component of what drives SIBO in people. And I showed that in my SIBO lecture all the time, but it's all of this data supporting that. So when you have a probiotic that can actually help the liver, that's really going to be important at going after the root cause with SIBO.

Michael Roesslein:

Okay. Is your company present on the stock market?

Kiran Krishnan:

Nope. Not yet.

Michael Roesslein:

Several people asked about parasites. Will it get rid of parasites? Will it treat parasites? My answer that I typed to that is that I would probably include it with any comprehensive approach to known parasite overgrowth is that it's probably incomplete as a standalone. And there's probably other additions that I would make to that.

Kiran Krishnan:

Totally. Yeah. A hundred percent agree with that. It's an important supportive component. If parasites are a real issue, I'd use an antiparasitic of some sort.

Michael Roesslein:

Do you ever recommend more than two caps a day? A few people asked about this. I know my answer is that I take two most days if I'm flying or traveling. Right now I take three. And if I feel ill in some way, I'll usually do three.

Kiran Krishnan:

Yeah.

Michael Roesslein:

Somebody asked about hyper loading or max, like tons of it. I've never taken like six or eight or ten of them in a day. I have no idea, but I don't think it's necessary.

Kiran Krishnan:

It's not necessary. No, I've taken ten in day before, two doses of five because I was overseas, and I think I ate something that was really starting to upset my stomach. And I did not have the luxury of being laid up in a nice comfortable place for three days being sick. So I was like, I had to nip this in the butt. And fortunately it helped. Then I was totally fine about eight hours later. But the most I usually take is about four. Starting cold and flu season, I'm on for all the time, because typically I'd be traveling nonstop during those times. Right?

So, with people with certain immune dysfunctions, what we find is in some cases, it really kind of pushes them closer towards getting significantly better if they do two caps, twice a day. One of the ways you gauge this is, let's say you're taking the product and your two caps, and you've made a good amount of improvement, but you're not quite there. One of the things that would be worth doing at that point is trying to bump up the dose, but you would first bump it up by going two caps twice a day, rather than four caps at once. Right? So you go to caps twice a day and see if that gives you enough of what it takes to get further along on getting your improvements. That's one of the easiest ways to gauge whether or not you need higher dose. But again if you're sick and you've picked up something, either your gut sick or your viral or other sick, then you could totally bump it up to four.

Michael Roesslein:

Okay. Let's see. Dosing have to be two different times. The standard dose is two capsules once a day. So it wouldn't be one in one, it would be twice.

Kiran Krishnan:

Yeah. It'd be two capsules twice a day.

Michael Roesslein:

Or two capsules once a day.

Kiran Krishnan:

Two capsules once is a normal day.

Michael Roesslein:

Yeah, is the normal dose. [crosstalk]. Split, one and one.

Can these be taken when the person is also taking antimicrobials, berberine, olive leaf caprylic acid for opportunistic bacteria? Would you just make sure to eat at separate times, or should you discontinue the antimicrobials? I've always just kind of taken them at separate times. I know that they're pretty resilient. Have you ever tested them against any of those things?

Kiran Krishnan:

Yeah. I know one of the best antimicrobials is this stuff right here, Biocidin. I don't know if you can see that it's disappeared.

Michael Roesslein:

Sort of. There it is.

Kiran Krishnan:

We actually incubated it in this liquid for a couple of weeks and the spores are still fine.

Michael Roesslein:

That's some strong stuff too.

Kiran Krishnan:

It's some strong stuff. So we would say with natural antimicrobials, totally fine to take it with it. And it'll be important because the natural antimicrobials, even though they're natural, will still kill good and bad stuff. Right?

Michael Roesslein:

Yeah.

Kiran Krishnan:

So you want to make sure that if you're going through a killing phase, you don't want that real estate taken up by any other opportunistic bacteria. So you want to make sure you're kind of killing things while you're putting in the spores that can orchestrate the right regrowth. So, absolutely. Anytime you're trying to make any sort of adjustment or change in the microbiome, whether it's an antiparasitic, antimicrobial, take the spores with it. It's quite important.

Michael Roesslein:

What about immunosuppressants? I know when I first started talking to you, there were some questions and it was talk to your doctor, and there were certain types of immunosuppressants that Bacillus spores might not be good mixed with because of their effect on the immune system. Someone asked specifically about cyclosporine. I don't know anything about that drug, but now that my wife has had autoimmune conditions for three years, I'm much more well versed on auto-immune or immunosuppressive drugs. She's been taking low dose of Prednisone, which isn't-it's a steroid, but it's not a biologic or immunosuppressant type drug. What is the most recent or latest, or updated info on that? Would it be a case by case thing or a drug by drug thing?

Kiran Krishnan:

The only immunosuppressants that we say upfront, "Oh, be cautious, be careful", is ones that are used for organ transplants. To prevent organ rejection. Those are pretty powerful immunosuppressants. It's really trying to bring down the activity of your immune system in general. And so the last thing you would need at that point is any sort of enhancing...

Michael Roesslein:

Anything to stimulate.

Kiran Krishnan:

Totally. And it's risky. The risk is too high because the last thing we would want to see is somebody taking a probiotic and get their new liver rejected.

Michael Roesslein:

Yeah.

Kiran Krishnan:

So it's just not worth it. And we have not studied it nor will we be able to study it. So we say, stay away. If they're on normal immunosuppressants, like biologics, like you mentioned for IBD and so on, we have lots of people that take it with those immunosuppressants. So it shouldn't be an issue. Again, if you're on immunosuppressants, you'll be taught, you'll be working with a doctor. We always say, talk to your doctor about it. But in general, we've not seen any issue with people using it with most types of immunosuppressants.

Michael Roesslein:

Okay. What is the product he held up? It's Biocidin and it's made by a company called...

Kiran Krishnan:

Bio-botanical.

Michael Roesslein:

Bio-botanical. Yeah, it's a really potent collaborative. Multi-herb antimicrobial that they have in multiple forms. He didn't say not take Biocidin and when taking MegaSpore, just that it won't kill the MegaSpore.

Kiran Krishnan:

Right.

Michael Roesslein:

We were not generally huge proponents of massive carpet bombing type approaches as a whole, and Biocidin is that. But some people love it, swear by it, get great results with it. And he just said that they dumped the spores into it and let them sit there, and they were fine floating around in there.

Kiran Krishnan:

So if you are taking Biocidin, totally take the spores with it, no problem.

Michael Roesslein:

And then this one, I have a lot of issues with any probiotic strains that cause, or produce D or L lactic acid, hence why I cannot take... That's why I only take D or L lactate free probiotics and noticed I'm researching Bacillus coagulans produces L plus optical form of lactic acid. Would these coagulans ones cause these DL lactic acid issues that I experienced with other probiotics?

Kiran Krishnan:

Well, so one important thing is it's the D lactate that causes the problem. It's not the L positive lactic acid. I have not seen any research that indicates L positive lactic acid can cause any sort of lactic acidosis. Now, the other problem with that is, the other reason is why do you have that sensitivity? Lactic acid is a really important component of a healthy gut. In fact, in many ways it's a measure of a healthy gut. Well, what's happening is you don't have enough bacteria that convert the lactic acid into short-chain fatty acids. That's where the issue is. One of the important things that the spores do is they dramatically increase the ability of producing short-chain fatty acids.

One of the papers that we published last year showed that in three weeks, we can improve short-chain fatty acid production by 50%. And so what you may do then if you're concerned about it, is just start with the HU58. The HU58 is just the subtilis alone. Just the HU58 alone increases short-chain fatty acid production by quite a bit. Once

you start getting enough bacteria that produce short-chain fatty acids, that lactic acid is a hugely beneficial thing in your gut.

So for one, I don't think the L positive will cause you any issues. We've never seen that, nor is it really well supported that, that has any impact. It's a D that's typically an issue, but if you're still concerned then start with the subtilis HU58, and then add in the MegaSpore later. But ultimately what you need to do is not avoid things that have lactic acid, because lactic acid is important. It's about getting your microbiome back into shape to be able to convert lactic acid to short-chain fatty acids.

Michael Roesslein:

Okay. And I have one more that I'm going to get to, and it's a question about... If I can, I'm going to try to maybe send you a couple in email. But regarding ferments, a few people asked questions regarding ferments and putting them in the ferments. It doesn't produce the same amount of organisms, I mean... if you don't put a certain strain in a ferment, it's not going to make it. But what we've heard from people that are fermentation nerds is that they use their normal strains for the ferment and then they put in the spores, and it makes a more diverse... kind of what it does in the gut, it makes more diverse organisms in the ferments. Is that what you've heard or seen?

Kiran Krishnan:

Well, you can definitely do it that way. The spores themselves can be primary fermenters under the right condition. We actually have a whole kind of recipe book for anaerobic fermentation with the spores, because they do it well in anaerobic conditions. What the spores need in a ferment is they need a little bit of sugar to get activated. And remember, a little bit of protein, because the alanine is important as well. So one of the things that we do, you could take a batch of fruits in a Mason jar. If you fill one third of the Mason jar with the fruits, the other two thirds with water, you put about a tablespoon of sugar and then add one capsule of MegaSpore. Mix it around. You will see it fermenting over the next three, four days at room temperature. Just leave it on the countertop and you'll see bubbles forming and all that. It'll become more like a seltzer. And it has all of the healthy components of numerous types of fermentation.

Michael Roesslein:

Is there a drink company out in California that got some spores from you guys and they're making drinks with spores in them?

Kiran Krishnan:

Yeah. So there's one company called CrowdSource that sells anaerobic fermentor and they've been making all kinds of anaerobic fermentation drinks. We've got a couple of big chem, which are companies that put it in the kombucha itself.

Michael Roesslein:

That's what I remembered.

Kiran Krishnan:

Yeah.

Michael Roesslein:

I found some in my store in Berkeley and I looked on the back and it had Bacillus. I think it was coagulans. I don't remember what it had in it, but I was like, "I know where they get those".

Kiran Krishnan:

Yep. Yeah, exactly. So you can totally add it to a known fermentation culture. You can absolutely primarily ferment with it. It does well in anaerobic, it does it at room temperature well. But if you want the spores to kind of start the fermentation, you got to add a little bit of sugar that helps them.

Michael Roesslein:

Perfect. For some reason, I just pictured you in a parking garage in the dark handing off briefcases of spores to kombucha makers. It's probably not...

Kiran Krishnan:

You want some spores?

Michael Roesslein:

You want some spores, man. That's probably not how that's done. I watch too many movies. I want to make two announcements. I have selected three people from the audience that will get emails from me with an address request. Well, I want to make sure that it's okay, that I share their name with everybody. That's why I'm not going to do it on here. I never did a contest like this, so I don't know the rules, but some people don't like their name broadcast and everything. And so I have three people. I'm going to send you an email, probably not until the weekend, because I'm still traveling this week with the family issues. I'll send you an email this weekend, get your address, make sure it's okay that I share your name. And then I will put the winners in an email next week and let everybody know who they are. If you're you, I'll reach out to you. I took screenshots. So I have three people randomly selected. I just picked from the list.

And also, we're offering a 10% off one time use coupon, which we're going to do for whenever we do one of these product spotlights that's relevant for that specific spotlight just for the people attending the webinar. I put that in the chat, and I'm putting a link to the product itself in there, too. The code is sporespotten. So spore, S-P-O-R-E, spot, S-P-O-T, like spotlight, like we're doing. Sporespotten, and that's all one word, no spaces, no anything. And it's 10% off MegaSpore, a one time use coupon. If you want to try it out, or if you already know you like it and want to get some more.

I should've known better, this was a million times more information. But this one in my defense, this one, there's way more information on this product than there will be on the rest of them because you guys have done way more studies on it. The Bacillus species are super huge researched and the other products are a little more simple. So I was saying, I emailed Kiran, so we're going to do a half hour. And he laughed then, but I'm like, "No, really just a half hour". And then we're an hour and a half in.

Kiran Krishnan:

Use the c-word concise, that doesn't happen.

Michael Roesslein:

I think I'm going to break this, edit it into about four. When you talk about the origin story, when you talk about the formula, when you talk about the research, and when we talk about the best practices and the Q and A. I think I'm going to make four short little videos and put that on a post so people navigate it. So this was awesome. I learned tons of stuff. I'm going to write a bunch of blog posts about those studies and educate around the relevance of that because I'm totally blown away by it. And it's got to be really exciting for you guys to see that start.

Kiran Krishnan:

I love it.

Michael Roesslein:

I mean, that's so wide reaching with so many chronic diseases.

Kiran Krishnan:

That's almost more in the pipeline too.

Michael Roesslein:

We need to dedicate an ongoing MegaSpore research section on our website.

Kiran Krishnan:

Totally.

Michael Roesslein:

Or something. So yes, we will send out a replay. Usually it's on Friday's. I'm going to try to stick to that, but I don't know. Things are kind of up in the air for me. I'm flying on Friday, so we'll see. But you'll get the replay. We'll actually transcribe it, too. So saw some people in London and it's awesome. We always have people in Australia. They're in tomorrow. London, the Europeans are the hardcore ones because in Australia and that area of the world, it's actually tomorrow.

Kiran Krishnan:

Right.

Michael Roesslein:

In Europe, it's two in the morning.

Kiran Krishnan:

Yes.

Michael Roesslein:

It's hardcore.

Kiran Krishnan:

Awesome.

Michael Roesslein:

All right. So thanks man. I really appreciate it.

Kiran Krishnan:

You're welcome.

Michael Roesslein:

This was awesome. Congratulations on all the research. It's amazing.

Kiran Krishnan:

Thank you.

Michael Roesslein:

And it's so fun to watch everything just blow up at light speed and all these new studies.

Kiran Krishnan:

I love it. Thank you guys so much.

Michael Roesslein:

Thank you so much. Thanks everyone for attending. Keep an eye out in your email. I'm going to be stalking you if I need to give you some free spores. See you later.

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