

Michael Roesslein:

I am going to hit record, we're now recording. And this is the winter immune system version of webinar. We are here with Microbiologist, Kiran Krishnan, our audience from Rebel Health Tribe knows you quite well. We've done like 30 of these. We did just add about, I don't know, 10 to 15,000 new people into our community a few weeks ago. So there's probably a lot of people on here who have not attended those 30 plus webinars. So just a little introduction for you. Kiran is the Chief Scientific Officer at Microbiome Labs and involved in formulation of all of their products over there. And you guys also have a lab that you run at Sacramento state. Is it?

Kiran Krishnan:

We work with them. Yeah.

Michael Roesslein:

Work with them?

Kiran Krishnan:

The researchers all run it. But we work-

Michael Roesslein:

Yeah, Yeah, yeah, yeah, yeah. You guys are working with a lab there at Sacramento state, so you're involved in research and then he traveled before COVID in 2019, like a bajillion and seven miles to speak at conferences all over the world and all over the US, in different cities. So a lot of speaking, a lot of teaching and educating, mostly for doctors and practitioners there. And oftentimes we get lucky enough to get the presentations first. So, that one that we did, the two-part, we have a two-part full dive into the gut and the immune system. I'll probably send that out with the recording of this one, just because it's super in-depth and awesome. And I bet that one's going to make it onto the professional rounds. And so-

Kiran Krishnan:

And it has. I had spent-

Michael Roesslein:

It already has?

Kiran Krishnan:

Yeah. Presented it at a number of conferences, virtual conferences of course, because we haven't had the ability to do actual ones, but yeah.

Michael Roesslein:

Okay. Yeah. So, we often get sneak peeks and first glances. So we're very grateful for that. It's really high level stuff. And again, in the blog, you'll find archived like a ton of webinars. We have Webinar Series, Microbiome Series and Microbiome Series 2.0. We were very original with the payment of that. And then, yeah, we have the immune one, there's all kinds of leaky gut one. There's just a billion. So maybe I will categorize them all and send them out to you guys to intro you and get you all up to speed.

So let's jump right in. My first question that I had was, is cold and flu season really a thing? I hear that talked about a lot. And is that even necessarily a thing? And if no. Okay. And if, yes, why?

Kiran Krishnan:

Yeah. So it's considered a season because the prevalence and the frequency of infection goes up during a certain period of time. Now, there's been a number of explanations as to why it goes up. A lot of it is in changes in population movements. So people stay indoors more and engaging more indoors and closer spaces. You're not spending as much time outside. Naturally what happens when the weather gets colder and dryer out, you might get more leaking in your mucosa and in your mucus production, that will shed more virus and things like that. And then you come in contact with it through fomites, which are things like door knobs and so on. It tends to spread a little bit more.

Now I think there's also a good connection between a reduction in vitamin D or an increase in stress during shortened day periods, maybe reduction in sleep, less outdoor activity, less exercise. I think, all of those things have played into the idea of this increased spread of viruses. And it's not that the viruses go away. There's colds and flus occurring all throughout the year. It's just a matter of an increase in frequency and prevalence during a period of time. And so, yes, there is a season. Yes, you will see it more prevalent during certain parts of the year, and it just fades away to a point where it's so low during other parts of the year that it's not even in people's considerations.

Michael Roesslein:

So we're more contagious and we have lower vitamin stores and lower defenses and are in contact with people's Gu more.

Kiran Krishnan:

A lot more. Even if you look at, like for example, with my kids. They, during the wintertime normally, obviously outside of COVID time. In order to get them to be able to burn off some energy would be going to things like, indoor ropes courses and ball factories and things like that. These are little cesspools where you get a lot of exposure from a lot of people in a confined space. We don't go to those things during the summer or spring or fall months because we spend a lot more time outdoors. So just that kind of physical contact, and physical contact in the realm of a drier period of colder period where people tend to be leaking more, all those kinds of things play into transmission and transmissibility of the vectors of the viruses.

Michael Roesslein:

Okay. So sort of the [inaudible], the flus don't get super powered or anything during certain times of the year, we're just around them more and more susceptible to them.

Kiran Krishnan:

It's our behavior. Yeah. That's all the changes. Yeah.

Michael Roesslein:

Okay. The reason I asked you to come on, and specifically for this webinar, is because you guys recently put out three new immune focused products. And I got a beautiful box with them in the mail. Very nice branded packaging, by the way, you can tell your people, whoever did that, it looked lovely. But we always try to offer a really high level education on anything we put in our shop. So we'll talk about those in a

minute. I did want to give some just general ways to navigate this season. And then talk a little bit about the gut and microbiome link.

Now I am going to send them that webinar, and that is a two-part webinar. It's total, probably somewhere in the ballpark of three hours. And there's a ton, ton, ton talk. We're not going to get into it like that because we don't have the time and we already did it. So just a little overview, either one, you want to go first, either general immune related things to keep yourself well or gut microbiome related, whichever you feel like diving into.

Kiran Krishnan:

Yeah. So let's talk about general immune first. What's really important to note is how your immune system functions. Once you understand, at least to a certain degree, how your immune system functions, it really becomes clear the things that can really impact your immune system. And some of the things you should be thinking about as you're trying to keep your immune system functioning the way it should.

There's two parts of the immune system, right? And there's the innate immune system and the adaptive immune system. The innate immune system are the first responders to the presence of any sort of pathogen that enters the system and then the second responders of the adaptive immune system. Now in the innate immune system, the general idea around that is it's a non-specific response. Meaning that part of the immune system knows that there's something wrong in the area.

It doesn't actually know what virus or what bacteria, what kind of immunogen it is. Immunogen, meaning something that actually has an immune response or elicits an immune response. It doesn't know exactly what it is. So it kind of comes in and it uses a blowtorch to kill mosquitoes, right? That's the analogy I always use. If you've got a bunch of mosquitoes that are flying through your window, if you use a blowtorch to kill them, you're going to kill the mosquitoes, but you're also going to burn the wall around it a little bit. Right?

And so that's how the innate immune system works. It's powerful, but it's also damaging. And it damages your tissue, it causes inflammation, it's driven by inflammation. And so in order for the immune system to actually properly respond and control infection and help the host recover, you have to escalate that into the adaptive immune response, right? So you have to go innate first, because they're the ones that get there faster. They start trying to control the pathogen.

And then as they're starting to try to control the pathogen, all of the signaling and all that is going on, and that activates the adaptive immune system which comes in. The adaptive immune system is highly specific to the organism that is causing the problem. And so it can attack those organisms without creating any other damage and the innate immune system fade away and stop functioning, right? So here's where the microbiome plays a role in all of that.

So I think that this will tie in that first question, second question together. The microbiome plays a role in every one of those steps. Okay? So for the innate immune system to even respond it requires signals from the microbiome, the local microbiome in that space in order to activate the innate immune cells to come in and actually start the response, right? So there are studies now that show that you can raise mice which have no microbiome, they're called no biotic mice are these sterile mice.

They have all of the immune capability, all of the immune functions, they have their bone marrow, their thymus, every gland, they produce all of the immune cells. When you introduce a viral antigen or you introduce a virus in those mice, the immune system literally sits back and watches the virus infect cells, multiply, infect cells, multiply and so on, until that mouse is dead. The immune system is there. It sees it. It does not respond.

The moment you transplant in a microbiome into those same animals and then you introduce the virus, the immune system immediately responds because it picks up signals from the microbiome. So the microbiome are the eyes and ears, the neighborhood watch of the immune system. So when a virus or pathogen comes in, the local microbes in the microbiome will alert the immune system to the presence of that pathogen. Then the innate immune system comes and starts acting.

Now while the innate immune system is acting, the microbiome also sends signals to get the adaptive immune system ready. So that the adaptive immune system can come along, tap the innate immune system on the shoulder and say, "Hey, I got this. You can stop what you're doing. Turn off the blowtorches. We're here with the precision, focus on those microbes themselves." Right? So every one of those kinetic steps, the microbiome is involved.

So without a healthy microbiome you cannot have a functioning immune system. Forget about a healthy high functioning immune system. You're not even going to have a functioning immune system, right? And so it's really important to keep that in mind, because when we keep talking about getting our immune systems healthy and functioning and all that, most of what you hear are things about zinc and vitamin C and vitamin D, and although those are all very important, you cannot take enough of any of that stuff to overcome a dysfunctional microbiome, because a dysfunctional microbiome is the foundation of immune dysfunction. Okay?

So that's an important thing to keep in mind. Now, all of those other compounds are critically important in facilitating certain steps within the immune cascade and response. So you need your microbiome. You need the microbiome there to be the operator and the orchestrator of the immune response. But the response itself will also require adequate amounts of those nutrients. So you should take your vitamin C or vitamin D, your zinc and so on, but you cannot forget the microbiome component of it.

So the step one in thinking about a healthy immune system is, thinking about maintaining or improving the health of your microbiome, right? So the things that you would do to improve your microbiome have a direct impact on your immune function. And most people don't make that connection, right? If I am fasting, for example, if I choose to do intermittent fasting, which I do, which has beneficial for your microbiome, that fasting not only is good for my gut, but it's actually really powerful for my immune system as well.

If I'm eating a large diversity within my diet, not only is that good for my gut, that's actually extremely important and powerful for my immune system, right? If I'm getting outside and getting involved in nature and going on hikes, getting that kind of exposure, that is not only good for my gut, it's actually really good for my immune system as well. And it's foundationally good for my immune system. That's a very important part of immune function. So the microbiome and the immune system are essentially one and the same. You have to keep your microbiome in mind as you're thinking about improving your immune system.

Now, beyond that, other things that impact your microbiome in a negative way, actually have a direct impact on your immune system. So one of the reasons why a lack of sleep will actually compromise your immune response is because lack of sleep actually creates dysbiosis in your microbiome. Your microbiome, like your body is a diurnal system, meaning it has this 24 hour clock. So it has these awakened sleep phases, during the resting period, you get all of these kinds of housekeeping microbes that start flourishing, and they start doing things like improving mitochondrial repair, removing debris. They start turning on things like autophagy and mitophagy and so on.

So they start turning on housekeeping genes, so that the body gets cleanse up. Damaged cells and damaged DNA and protein and all that, get to be cleaned out from the system. They improve and move digestive juices all the way through the peristaltic activity and the migrating motor complex kind of cleans out. Your gut doesn't allow things to sit there to purify. The microbiome itself starts metabolizing and producing a number of compounds that are important. So all of these things are going on overnight while

you're sleeping. And if you get inadequate sleep you arrest many of those functions. And because those functions when arrested impacts your microbiome, it directly has an impact on your immune system, right? You also know that stress control is incredibly important for your immune system. And that's because when you're stressed, what happens is, you get an increase in cortisol epinephrin, norepinephrine and other stress hormones. What that does is actually dramatically increases intestinal permeability. It also increases the growth of pathogens within the system. So in your system right now, you've got a number of bacteria and viruses that are latent opportunistic organisms. Meaning, you got exposed to them long time ago, things like Epstein-Barr virus, cytomegalovirus.

And then they sit around in your system waiting for the right signals to start flourishing. And when they flourish, they actually cause lots of inflammation, they produce toxins, they create damage to tissue and so on. And they only flourish when you're under stress, because they've learned to read the stress response of the host in order for them to turn on their virulence factors. Because they're not strong enough pathogens that they can create a proper fight when the host is healthy, because a host immune system can come in and actually control them pretty easily.

So they sit and they wait for you to be stressed, because they've learned that when you're stress your immune system function is dampened. So then they start rearing their ugly heads. You start getting increased toxicity, increasing inflammation, your gut lining opens up. It becomes more leaky. All of those things compromise not only your microbiome, but significantly compromise your immune system because of the function of your microbiome. Right? So all of that is tied into place.

So the rest of the mindfulness, the stress management, getting outside and getting exposure to the natural environment, doing some fasting, increasing the diversity in your food that you're eating. Things that you would take in that are good for your microbiome, like probiotics, prebiotics, polyphenols, EPA based omega fatty acids. All of these things, not only are improvements and important for your microbiome, but also significantly impact and improve your immune function. Right? So don't think of them as different, they're one and the same. Everything you do that's good for your gut is extremely good and beneficial for your immune system.

Now, beyond that, so put the gut stuff aside, right? And we've been addressing the gut stuff for a long time, because we've got the MegaSpore and the probiotics and prebiotics and immunoglobulin, we've got a lot of tools for that. There are other aspects within the immune system that we can enhance, especially under times of stress like we are all in right now. Because we're not just under stress from this pathogen that's going around, but we're under political stress, financial stress. Just not being able to do the things you normally would do creates all kinds of stress on your system.

So we decided to put together a product that actually had components in it that helps certain kinetic steps within your immune response. And I'll talk about what those kinetic steps are. And then I can share some slides on the couple of products as well so you can see. So remember when I described your immune response, right? The first thing that happens during the entry of a pathogen into your system. Let's take the flu, for example. You breathe in some influenza virus, the virus goes in and it starts trying to attack the upper respiratory cells, right?

So you've got a cell here, this is your upper respiratory cell, the virus comes in, sits on top of the cell-

Michael Roesslein:

Looks just like it.

Kiran Krishnan:

Exactly. Right? The demo is flawless. And then the virus tries to make its way into the cell, because what it's trying to do is hijack the machinery of the cell to turn it into a virus factory. This virus cannot multiply by itself. So it goes in, it tries to take over the machinery so that this one cell now will produce three, 400 different viral particles before it bursts open and releases all of them. Right? So as this cell starts getting infected, this cell itself starts sending out distress signals. That, "Hey, I'm infected." At the same time it releases things like interferons, which try to slow down the viral replication that's going on inside the cell.

Now, the first things that pick up the distress signal from the cells, and in some cases, it picks up the presence of the pathogen itself or the microbes around the cell, right? So these microbes around the cell will start sending signals to your immune system to say, "Hey, there's a cell that's infected here. We need you guys to show up and start taking action." Of course, the first ones that they recruit and the first ones that show up are the blowtorch guys. That are going to come here and blowtorch this whole area. So it's going to kill this cell and it's going to kill every other cell around it as well. Right?

So that's the first part of the kinetic response. And then what has to happen in order to facilitate the response to the next level, is there has to be a deescalation of the inflammation, right? Because all of this blowtorching response is escalating the inflammatory signaling and the inflammatory response in that local area. That's what you start to feel when you actually feel sick, right? When you're feeling sick from something, especially when it comes to a virus, it's not necessarily the virus itself that's making you feel sick, it's your immune response to it, right? And it's the innate immune response to it.

Once your symptoms start to subside, it means the innate immune response has taken a back seat and the adaptive immune response has come in and it doesn't trigger all of the same symptomology as the innate, because it's specifically going after the virus. Right?

Michael Roesslein:

So the sickness, the illness, what we feel is generally the innate immune. The heat, the fever, which is part of that. And then the attacking and the killing and the damaging and the blowtorching the mosquitoes.

Kiran Krishnan:

Totally. Yeah. So the increased production in mucus, the stuffiness, right? The chills and the fatigue and all that, all of that is a factor of the innate immune response to the virus. Now, if you're feeling sick for a long period of time, meaning you're symptomatic for a long time, especially severely symptomatic. It means that the innate immune system is running for too long. And that's problematic. We all know that in the case of this virus, the thing that really gets people is when you go into the cytokine storm, right? Most people have heard of that term.

Well, what does that term actually mean? It means, the blowtorch guys have shown up finally, and then they're starting to blowtorch things. And because the infection is now bigger than the immune system is comfortable with, the blowtorch people just turn on the flames even higher to try to control the spread of the infection. And it causes this cascade of destruction within the tissue itself. So you've got this rolling cascade of more and more and more turning on of blowtorches at every step and creating this storm, if you will, right?

We're not getting that tap on the shoulder from the adaptive immune response going, "Okay, let's turn off the blowtorches. We're going to go in here surgically and get rid of this pathogen." So that step is really important. That's called a deescalation step, because we need all of that blowtorching and massive inflammation to slow down and then we need the adaptive immune response to take over. Right? So that kinetic is really important. So a few things that people don't really think about when they're thinking about immune health and immune function is, number one, how do we improve surveillance? Right?

Because you've got immune cells that have to survey the entire system on the inside of your body to try to find pathogens, or at least respond to the signal that pathogens are present from the microbiome. So that surveillance is really important. If you don't have adequate surveillance, it'll take longer for the immune system to respond when the pathogen comes in, that gives a pathogen a longer amount of time to replicate and create more versions of itself. So that surveillance is really important. So you want to support surveillance in a significant way.

You also want to support something called a T reg system. That's the regulatory component of your immune system. Now, why do you want to support that? Right? It's because the immune system becomes easily distracted. If you are someone that is very sensitive to environmental things, like let's say pollen or ragweed, right? Now, you've got ragweed coming in from the outside, your body is all responding to it in an inflammatory manner. And then you've got a virus that comes in at the same time. The immune system gets highly distracted because it's also attacking all of this ragweed, right?

That's why the symptoms of allergies and all that, because it's the immune system, the blowtorch innate immune system that's attacking those allergens. And because you've got all this focus on it, now you have less immune response towards the virus. And in fact, the virus itself may get lost in this milieu of inflammation that's going on because your immune system is attacking the ragweed that's coming. So the T reg system is really important, because the T reg system helps the body suppress all of those unwanted and unnecessary immune responses, so your immune system can hone in and focus in on the things that it should attack, right?

So that's a really important part. So the increased surveillance, the increase in T reg. And then the third thing is deescalation, which means that as an innate immune system is revving up, it also needs to be revved down at some point so the adaptive can take over. That deescalation extremely important. You need a repair support for the tissue that actually gets damaged during the process of the innate immune response. Because what tends to happen is if those blowtorch guys comes in and they start blowtorching all the cells in this area, including the infected one, you're going to release cellular debris, or your own cellular debris.

If the immune system is continuing in this manic attacking phase, it'll start attacking some of your own cellular debris as well. And that's how you can get cross-reactivity to your own tissues, right? And that causes even more symptomology that can cause things like the loss of taste and smell. You've got inflammation and attack on the neurons that are controlling things like taste and smell. You can get skin rashes. Like certain viral infections will give you massive skin reactions, right? Those are all the inflammatory cross-reactivity that occurs.

So repairing the tissue that gets damaged during that blowtorch component, is a very important part of, again, bringing down and deescalating the immune response so we can get the adaptive in there as well. So that's another thing. So surveillance the deescalation I talked about, the improving the T reg system. And then lastly, we would need to support the adaptive immune response, the B cells in particular, the memory T cells and so on, so that they can come in and take control of the infection because not only will they then control the infection without all the symptomology of the blowtorch guys, but then they are also the memory component of the defense, right?

Michael Roesslein:

These are antibodies. So that if that comes back the body's like, "Hey, this is here again, let's kill it." But you don't even know, right?

Kiran Krishnan:

You don't even know, yeah.

Michael Roesslein:

If a bug goes into your body that you have adaptive immunity for, you don't even know what happened.

Kiran Krishnan:

You don't even know what happened, because it came in, we did have to elicit the blowtorch response, which is the part that makes you feel sick. The adaptive immune system is kind of like, "Hey guys, I've seen this before. We know exactly what it is." They will amplify the B cells that actually make the antibodies against that one thing. You'll get a bunch of antibodies that come in and neutralize the virus bacteria, whatever it may be. And you'll never notice you even had it. You never noticed you even battled it.

You also have memory T cells that can do that. These are T cells that are particularly good at coming in and killing things like viruses, bacteria and so on. And they have long-term memory as well. In the case of COVID, that seems to be a very important component of the longer-term protection. We're not seeing that everybody that gets exposed to COVID actually develops antibodies. There are a number of people that never develop antibodies but only develop memory T cells, right? So we've got both of those components of memory.

Now, when you look at somebody, like two different people that got infected with COVID, and let's talk through two different responses, right? So one person now ends up basically sick for seven to 10 days, high fevers, sweats, loss of taste and smell, all of that stuff. And then another person that gets exposed to the same virus, but has almost no symptoms and is totally fine in a day or two, right? What is the difference there?

The big difference there is, that this person, the one that has long-term symptomology and the severe symptomology, their system went into this cytokine storm cascade and the innate immune response was too prolific in their response to the presence of the virus. In this case, the person that remained asymptomatic for most of the time, maybe slightly symptomatic and then got fine. They had an innate immune response, but then they probably had a better shuttling of the adaptive immune response to take over the infection so that they didn't end up having all of that symptomology for that long period of time.

And so one of the key factors between the two is what is your level of inflammation before you got infected? Right? There's something called the Boston Dublin score. And this was a study published in October, where two big research groups, one in Boston, one in Dublin, looked at and measured all kinds of markers and thousands of people that ended up getting exposed to COVID. And what they were trying to figure out, is what kind of marker predicted the severity of the response to COVID, the immune response to COVID whether you got hospitalized or even succumb to it.

And they basically found two markers that were predictive of your response to COVID. One was interleukin 6. Interleukin 6 is the quintessential inflammatory cytokine, right? If people were elevated with interleukin 6 when they got exposed to COVID, they had a much higher chance of having a negative response that would take them to the hospital. If-

Michael Roesslein:

It's the blowtorches that were already high.

Kiran Krishnan:

Say that again.

Michael Roesslein:

Because the blowtorches were already high.

Kiran Krishnan:

The blowtorches are already on and they're already on everywhere, right? And not only does that, of course, drive more inflammation. The problem with that is, when the virus first enters the system and starts infecting certain cells, whether it's in your upper respiratory tract, in your gut, this particular virus can infect many different cells. The first signals that go out to the immune system to tell the immune system that the virus is there, is interleukin 6, right? And those kinds of inflammatory signals.

So what is happening is that that alarm, right? That alarm called interleukin 6, that your own cells and the microbes around it releases to try to get your immune system to that area, gets lost in the milieu, because everywhere else in your body you've got interleukin six flying up. Right? So the analogy I give is, imagine you have a neighborhood with 500 homes. And one of those 500 homes is a small fire starting in the living room and the fire alarm starts going off. It's very easy for the firetrucks to know exactly which home that is, get to it, put out that fire before it gets too big.

If that same home a small fire was starting, the fire alarm went off, but all 499 other homes in the neighborhood also had fire alarms going off, it'd be very hard for the fire department to figure out which house is actually on fire until the fire got big enough where you could see the smoke and the actual house burning, then the firefighters are going to come in and the response to it is going to have to be much bigger, right? That's the same thing that occurs in your body when you have elevated interleukin 6.

When you have elevated interleukin 6, basically what happens is you've got fire alarms all around the body and the alarm that's being sent to signal your immune system that the virus is here is not being heard by the immune system. So it takes the immune system longer to respond to that area. And by the time they finally do the fire is so big that the damage is more catastrophic in that local area, that your innate immune system, the blowtorch guys do super blowtorch mode to try to control everything. That already puts you into that cytokine type of storm.

That's what's happening to the people that are going asymptomatic, asymptomatic, asymptomatic for a while and then boom, they've got 104 fever and they're knocked out, right? Because during that asymptomatic period, the virus was replicating and increasing its load over and over again and the other alarms in the body are distracting the immune system. And then all of a sudden the immune system finally is able to notice this infection but the infection is so big that the immune system has to mount a really massive response, then boom, you feel all of the symptoms immediately.

It doesn't become gradual. It's not like, "I kind of feel off today." Then for a couple of days you feel a little bit worse and a little bit worse, then you peak and then you start getting better and better. That's your normal immune response. A lot of times what we're seeing with this virus, it happens with the flu as well, where you're perfectly fine, perfectly fine and then all of a sudden within a few hour period, you're also just run down, beat up, you take a nap, you wake up, you've got a high fever, your sweats, all of these things. And that's because your immune response kind of falls off a cliff.

So considering all of that stuff... I'm throwing lots of information out at you guys. And I promise you I'll kind of summarize it in a useful way for you. But my biggest points here is that when you're thinking about immune health, especially when you're thinking about it through the winter, through cold and flu season, especially in light of a pandemic, everyone's concerned about making sure their immune system's functioning well, you have to make sure your microbiome is functioning well also. Because if you don't, your immune system is absolutely compromised.

Your microbiome and immune system are one and the same. Your immune system cannot respond to the presence of a pathogen without the microbiome. And if your microbiome is dysbiotic and you've got more opportunistic, problematic, toxic, viruses, bacteria, and so on, those types of organisms in your microbiome aren't looking to help you, right? They are, in fact, looking for conditions under which they can proliferate,

which would be when your immune system is distracted by a different infection then they get a chance to proliferate and because of that, they're not going to be one of those that are signaling your immune system when something new comes in.

So if your microbiome is dysfunctional, is dysbiotic, you're going to have a severely compromised immune response, not only in the beginning, but also that deescalation, that moving to the adaptive state and so on. Now, in all of that kinetic, there are herbal products that really are herbal ingredients that really support some of those transitions. Some of the things I mentioned that are really important, improving surveillance, increasing T reg function, the regulatory part of the immune system, the deescalation from that massive inflammatory response so the adaptive system can come in and then the adaptive support for the B cells, T cells that function in the adaptive immune system.

And then lastly, the repair of the damage. The damage that's elicited by the immune response itself. All of those things are critically important. So let me share a slide, if that's okay. And then I'll show people what-

Michael Roesslein:

Yeah. Go ahead.

Kiran Krishnan:

... that actually looks like. So in order to achieve all of those things, we actually formulated this particular product. Because we feel quite good that, of course, we've covered the microbiome component of the immune response quite well with the other things that we do. But we want it to be able to give people a comprehensive solution where not only you have the microbiome component covered from a bunch of our other products and therapeutics, but then we also wanted to give you the ability to really facilitate some of these types of responses. So this is a product called MegaMune.

MegaMune basically becomes kind of like a daily immune support. It's just to keep your immune system, and what I call a level of functional readiness, right? So some of these things, for example, zinc. You guys all familiar with zinc. There's nothing too unique here, except that it's a bisglycinate form. And the bisglycinate form has better studies around immune function. Their bioavailability is great, the tolerance is great for bisglycinate form. But one of the key things here is it supports a T lymphocytes. The T cells act in both phases. The T-cells act in the end part of the innate immune response, but then they also function in the adaptive immune response.

The T cells are highly important for normal immune function. So you want to really support the T-cells. And that's where a zinc seems to play a role. IgG is a production of the longterm immunoglobulins that protect against future exposure to the same pathogen and production of IgG. And then of course, macrophage functions, which are the cells that go along and eat up things that are infected, eat viruses, bacteria, and so on. Those cells acting in the innate immune response are also supported by zinc. Selenium is a really under appreciated immune ingredient and especially selenium methionine.

Because in that selenium methionine, it really becomes a 21st amino acid. Conjugated with methionine it immediately enters into cells. And it has really important antioxidant properties because one of the ways that damage occurs during the immune response, is a high degree of oxidative stress, right? That breaks down and damages your own tissue. So that antioxidant capability of selenium methionine is really important. And it's also one of those that supports the T helper cells. So what are T helper cells? The T helper cells are the components of the immune system that helps shuttle the immune response from that blowtorch inflammatory response to the adaptive surgical response, right?

So that is a really important function of these T helper cells. So these T helper cells are significantly supported by selenium methionine. So already we're looking at improving the adaptive immune response,

the transition between the adaptive and the innate immune response. And then of course the support of the T helper cells, which also shuttles the body into that other adaptive response. This dried yeast fermentate is one of my favorite products. It's a *Saccharomyces cerevisiae* yeast fermentate. So it's the fermentate component of it.

And it has very good and strong antioxidant properties, but it also dramatically improves and supports the secretion of IgA also natural killer cell. So IgA is the immunoglobulin that's found in all your body secretions. That's a really important part of your first line of defense. Because as a virus or bacteria enters into your system, if there's adequate IgA, the IgA is going to nail the bacteria and virus and basically neutralize it. So you've got really good IgA production. You've got a lot of protection as part of the first line of defense.

Natural killer cells are a type of cells that act in the innate immune response. They are a powerful cell, especially during viral infections. So they can go and they will find cells that are infected by viruses and directly kill them. So this plays a really important role in part in that surveillance, but then it also plays an important role in part of that repair component of the immune response. Same with echinacea. Echinacea supports white blood cells in general. I think most of you are probably familiar with that.

But the broccoli seed extract was really important to us because, again, of the antioxidant properties, because we have to keep trying to dampen the damage that's happening to your tissues from the immune response itself. So it becomes really important to have this antioxidant property. Because one of the ways that the innate immune cells kills viruses, bacteria infected cells, is by using superoxide. Superoxide is a tool that your immune system uses to kill things. So if you've got a lot of superoxide going on, you need a little bit of antioxidant to protect the cells that are not infected and the cells that don't have issues.

It also protects the natural killer cells and B cell formation, which means it's really important for the adaptive immune response. And it supports something called phase one detox pathways, which is an important part of kind of clearing the system of a lot of toxicity that has built up through the immune response. Green tea leaf extract is one of the very important things for immune response. And we really did not find it in any immune products on the marketplace. Because not only does it have the antioxidant properties, which are really important, it does also support T reg cell function and, of course, natural killer cells.

So continuing that surveillance and first response capability. But the key thing here is the support in T reg cells, right? Remember I mentioned T reg cells are the cells that dampen or reduce unneeded and unwanted immune responses, right? Because if you have immune responses going on all over your body to all kinds of things, which includes environmental particles, food, and so on, then your immune system is going to be distracted and not really be able to pay attention to the thing that's causing the biggest problem, which is the virus or the bacteria.

So green tea is extremely important. You might wonder why in the world we have pomegranate in immune product. Well, because again of its antioxidant properties, but also supporting the diversity within the microbiome. The green tea also supports diversity and also-

Michael Roesslein:

And it's delicious.

Kiran Krishnan:

And it's delicious, right? And it's super fun. And pomegranate also supports something called mitophagy. Mitophagy is the regeneration of mitochondria. Which is so important because every time the immune system kills off cells, those cells have to be regenerated, the mitochondria within those cells have to be

regenerated so that the tissue can go back to functioning like normal. So you can see just from these three aspects alone, we really focus on the recovery of the tissue during the course of the immune response as well, because that is something we found that is completely missed and really not address in immune supportive products.

So that was really important. And then the cranberry fruit extract, again, antioxidant properties, and it supports microbial diversity. And the more diverse your microbiome is, the more it can be protective for you, especially in the context of your immune response itself. So this is MegaMune. It's quite unique in this way, because we were looking at herbal compounds that we thought were foundationally important for facilitating proper immune response, right? And then facilitating this functional readiness, especially when you pair it with the other gut supportive products. So your microbiome is being addressed through the probiotics and so on as well. So that's MegaMune.

And then MegaViron is basically a bit more robust version of it with a couple of additions. Things like turmeric, which can really help with facilitating further immune response, but also reducing that inflammatory component of it so that your immune response can actually shuttle in the right direction. Andrographis, again, more for anti-toxin properties and also for inflammatory response. We've got things like the Chinese skullcap, which promotes a cytokine process. So it helps the signaling, the messaging that occurs during an immune response.

N-acetyl cysteine which supports the glutathione system, again, to bring down the damage that that is occurring during the immune process. A number of the things, sea buckthorn. We've got stinging nettle, again, which modulates the immune response to your immune system's not overreacting to certain things and being distracted by other things. So all of these things including beta glucans that are hugely supportive of natural killer cells and also in transitional cytokines from the innate to adaptive immune response.

Red Korean ginseng, promotes natural killer cells as well and supports the dendritic cells part of that innate immune response. And then dendritic cells also help facilitate the adaptor response. Now this particular product is designed to be a two-week dosing. So you would do the MegaMune as kind of your daily functional, ready, facilitating and supporting their immune system, should you start to feel symptomatic from something, that's when you would start in on the MegaViron and then just do that for the next two weeks, along with the MegaMune as well.

You can take them both at the same time. There isn't a multiplication of doses of things that puts it in an unsafe layer. But that's the difference between the MegaViron and a MegaMune. Now-

Michael Roesslein:

A box of these arrived two days before Mira got sick for the first time in three years. Now, one benefit, if there is one of having auto-immunity, is they rarely get sick. Like illness sick, like cold sick. And she used to get colds and flus all the time. Hadn't got one in three years. Got really sick a few weeks ago and I was like, "Oh, wait, I have this box." And it was like two days before, so much so that we were making jokes that Kiran somehow was responsible for getting Mira sick so we could put the products and get them to try. But, yeah. It's just funny.

So the first one is more of an all the time support. Second one's an acute use sniffing coughing cold type of, I don't feel good [crosstalk]. Okay. And then this goes in her bag to work every time she goes to work.

Kiran Krishnan:

Oh yeah. Absolutely. So when you look at the MegaMune and MegaViron, keep in mind that the way it's formulated as it's doing and supporting things within your immune system that we did not see being supported in other immune products out there in the marketplace. And when we pair up those

functionalities with what the microbiome does, then we see that as providing more comprehensive support and response to your immune system, right? So it's really a powerful pairing between what you're already doing for your microbiome. And then you bring this in to help facilitate certain aspects of your immune response.

Now, the third one that was in this family of products is MegaCidin. MegaCidin is super exciting for us, it's been a couple of years in the making. Really, the idea came about from wanting to be able to give people a way of delivering the spores in a somewhat uniform manner in the oral cavity, right? Because what we wanted to do was to get the spores to engage with the immune cells that are in the buccal tissue. That's all the soft tissue in your mouth and your gums and so on.

There's a lot of immune tissue in here and certain organisms like the Bacillus spores have a capability of supporting an early stage immune response, kind of a first line of defense, if you will, by interacting with the immune tissue in that region. Now your mouth, eyes and nose are typically the primary areas of entry for any sort of pathogen, right? Either it's coming in through food that you accidentally put in, or you're touching your mouth after touching things with their hands, or they're coming in through your nose or your eyes and all of that drains into your throat.

So all of that is hitting your mouth at some point. Now we also started working a number of years ago with Bio-Botanical Research that makes the well-known product called Biocidin. Biocidin has all of these herbal blends in it. And they have independent studies on Biocidin showing all kinds of supportive function for the immune response, especially in the upper respiratory area when you do this Biocidin spray. We were able to add in the spores so that you've got that extra layer of protection.

So the way you would use this is you would basically carry it around with you and sprayed a couple of times a day, maybe twice in the morning before you go out somewhere and then a couple of times when you come home in the evening, or if you're like Mira, and you're going to work in a place like a hospital where you have higher exposure rate, then you can just have it in your pocket and do a couple of sprays throughout the day to provide you that protection. So this kind of protects the gateway that organisms can come in. So it gives you a little bit of an added protection there for the gateway.

And then you've got the MegaMune and then all of the microbiome related products that supports the gut diversity the function like microbiome. The MegaMune, maintaining this functional readiness to your immune system. And then finally, should you ever start to feel anything, then you start on the MegaViron and do that for a couple of weeks. Now, if you're taking vitamin C, vitamin D, you would still continue to do that. For me, in addition to the Biocidin or the MegaCidin that I use every single day, I of course take the MegaMune and then our probiotics and all that. But I do take a vitamin C as well, and I do take a vitamin D. So I do take some of those other compounds along with it. But in general, this is my focus.

And I think we have about seven minutes. I figured, right-

Michael Roesslein:

I can go rapid fire. Because I tried to figure out how to copy the Q and A box and it won't let me copy and paste it, do anything actually there. Hold on. I have it copied. Let me just paste that somewhere real quick in case we don't get to all of them. There we go. It's a little messy but I'll figure it out. Autoimmune, tons of questions about autoimmune. Now, we didn't give Mira the MegaMune, because there's some ingredients in there that are kind of stimulatory to the immune system. We did give her the MegaViron when she was sick.

But what about people with autoimmunity? They're often told, "Don't take supplements to stimulate the immune system." Would you recommend they talk to a practitioner or is there a counter contraindication here?

Kiran Krishnan:

Yeah. So some practitioners are uncomfortable with things like echinacea, for example, in autoimmune patients. Right? So I would talk to a practitioner. You can always try a small dose of it. The daily dose of the MegaMune is three caps. So you could try one cap and see, "Okay. Does that agree with my system? Do I feel okay?" And for some reason you don't feel like it's agreeing with your system, then you would not continue using it. In my view, typically, if you've been doing the probiotics like the MegaSpore and so on, beforehand, your body's ability to modulate immune response should improve significantly and then using something like the MegaMune shouldn't be an issue. But certainly if you've got an autoimmune you should talk to a practitioner about it.

Michael Roesslein:

Okay. What does it mean to have compromised immune system? They're hearing that all the time now on the news. What are the best behaviors to counter it? And I think we talked about a lot of the best behaviors to counter it in here. But what does that really mean? Compromised immune system. Could there be [crosstalk] two different things?

Kiran Krishnan:

It can be. So the most common way that your immune system is compromised is that it fails to react appropriately with the right kinetics, right? So it's either responding too late, which means it's going to be responding with too severe of a response. You're going to feel super sick, you're going to decline quickly or it responds too robustly right off the bat. It doesn't shuttle between the innate and adaptive immune system. Or it just doesn't respond at all because it's so distracted from all of the inflammation going on all over the body. Right?

And that's why for something like COVID, the people that have the worst response to something like COVID are people who have diabetes, who are obese, who have heart disease, hypertension, old age, all of those things, the underlying feature of those are chronic low grade inflammation, right? And chronic low grade inflammation causes a distraction within their immune system. So compromised immune system typically means that the immune system is not reacting, it's too slow to react or react in the wrong way. Right?

And all of those things can be rescued to a certain degree, which is the benefit here. Now, there are some people that have an actual genetic snip. Like for example, they have a CD4 snip that doesn't allow the T helper cell, CD4 to shuttle the body to the adaptive immune response. That is a much more rare thing. But it can be compromised that way as well.

Michael Roesslein:

Okay. I just posted, I was so engrossed in what you were talking about that I forgot to even tell them where to get the products. I put a link in the chat and I'll send it out to you guys, but I put a link in the chat. We have a page that has all the products on it. So you can check them all out. And there's code there for discount on the solo products or on the trio bundle we put together. So, go to that page. It's, rebelhealthtribe.com/immunetrio. We'll be sending that out with the recording and everything too. But I wanted to give a dimension here. I have like six messages like, "Hey, how do we get this?"

Sorry, I'm usually more on the ball with that. I was engrossed in the questions myself. So rebelhealthtribe.com/immunetrio. There's codes there for 10% off solo products or 15% off the trio. I'll do one more question. I have copy. If you have a question in the Q and A box, I've copied them. So maybe I could email you a few questions Kiran, and you can do to them that way, and then I'll send them out.

Kiran Krishnan:

That'd be great.

Michael Roesslein:

I think the last one would be, is this safe for breastfeeding moms?

Kiran Krishnan:

Yes. Mm-hmm (affirmative).

Michael Roesslein:

Okay. If one is sensitive to yeast, like brewer's yeast, baker's, nutritional, would one be sensitive to the dried yeast fermentate MegaMune?

Kiran Krishnan:

We have not seen that. No. And that product actually is really widely used. I know, I myself have been using it now for almost three years. Just the yeast extract itself it's in a product called EpiCor, by itself. We decided to put it into this product because most of the people within our company use it when they're traveling and during this cold and flu season and so on. But we haven't found any issues with people who are sensitive to yeast, because I think it's focused on the fermentate part of it and not so much the yeast part of it.

Michael Roesslein:

Okay. And then the alcohol. Is the yeast fermented alcohol? Can't have any alcohol and the MegaMune product. Is that yeast ferment and alcohol? No?

Kiran Krishnan:

Mm-hmm (affirmative). Yeah.

Michael Roesslein:

Okay. I think that's the best I can do right now. Some of these are... Yes. Yeah. I think I'll just send you a few more that we didn't get to on there. And we did it.

Kiran Krishnan:

One hour. Wow.

Michael Roesslein:

Yeah. This is our shortest one ever we've done. Somebody said, we said we're going to go an hour a whole bunch of times. So we've never successfully done it. So, I'd love to stick around and chat some more and get some more questions answered. There's probably about five or six other questions. So I'll email you. We didn't have any Dropbox. 300 people here and they all stayed the entire time, which is incredible for an hour. Thank you everybody. The questions are awesome. You guys are always awesome.

So go, rebelhealthtribe.com/immunetrio. If you want to try out any of these products, they're all in one spot. There's discount codes there for you to give them a try those at work once on like a first try. And if you have any questions, shoot me an email. I'll try to get them along to Kiran. But thank you so much. And-

Kiran Krishnan:
Thanks everybody.

Michael Roesslein:
... you guys are putting out formulas faster than I can keep track of them. So it's come a long way since the one product show in the little room-

Kiran Krishnan:
In Chicago.

Michael Roesslein:
... with the MegaSpore in Chicago, in the little room with one person filling all the boxes.

Kiran Krishnan:
It has. We've now got almost a hundred employees, so it's crazy.

Michael Roesslein:
And what? About, 15 products?

Kiran Krishnan:
Yeah, Actually with these now added. Yeah, maybe 16 or 17. And we've got an insane pipeline for next year. There are some things that we're going to be coming out with that we're going to be using microbes in ways that have not been used before therapeutically. So just keep an eye out. There's going to be some crazy things coming out where the science and the innovation behind them are really mind boggling. So it's going to be super exciting.

Michael Roesslein:
I'm going to cut that little clip out and posted on our sites and get people hyped up. So.

Kiran Krishnan:
Sweet. Do it.

Michael Roesslein:
Cool. All right. Good to see you, man. Good to talk to you-

Kiran Krishnan:
You too.

Michael Roesslein:
... Thanks for coming to explain this stuff to us. Always appreciated and we'll talk soon.

Kiran Krishnan:
Thanks everybody. Bye-bye.

