Episode 598: Steven Wright on 5 Common Immune Misfires & How to Make Your System Smarter
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smarter, not just stronger, and why you would want to. I'm here with Steven Wright, who is a medical engineer. He's a Kailash Foundational Medicine Institute graduate and a gut health specialist. He spent close to $400,000 overcoming his own health challenges, using everything from western medicine to shamans and everything in between. He's also the founder of healthygut.com, and he lives in Boulder. He's also a personal friend. And in this episode, we go deep on the immune system and on all aspects of immune health, specifically what an immune misfire is, and the different ways that the immune system can misfire. We talk about the two parts of the immune system, the innate and the adaptive side, and why understanding the distinction is important, especially if you're dealing with immune system issues.

The five symptoms of immune misfire, what cytokine storms are, and what they can tell us. Why skin issues are often immune-related. And then we talk about what paraprobiotics are, and how they are relevant to immune health. We talk about how they can help with things related to the gut, to histamine, and what the studies are currently showing about these, what also separates them from regular probiotics because they are an immature form of probiotics, essentially, that transmit information, but don't have a bacterial effect in the same way that probiotics do. And then we talk about why sleep and melatonin are important to the immune conversation. So, a lot of practical tips in this one. If paraprobiotics are a new topic for you, you'll learn a lot about them in this episode. So, without further delay, let's join Steve. Steve, welcome back.

Steven: Thanks, Katie.

Katie: It's always so fun to chat with you. And we get to go in a direction I haven't really gotten that much on this podcast before. And I know I always learn a lot from you. So, I'm super excited to jump in. But from a broad perspective, to start off, we are going to delve into the world of immune misfires, and how to make your immune system smarter. Because often, I think...and you explain this, we'll, you know, we think of making our immune system stronger, but you differentiate that actually like, smarter is the way to go. But I think to establish some foundation for this conversation, maybe you could start off by explaining what you mean by immune misfires for anybody who that's a new term for.

Steven: Yeah, sure. So, your immune system, if you don't know it's kind of split between two main sides, your innate immune system, your adaptive immune system. And so, when you hear people talking about inflammation, or fevers, or natural killer cells, white blood cells, this is all on your innate side of the immune system. And it's kind of nonspecific. So, when you swell, like when you turn your ankle, and it swells up, your body just knows that there's something bad happening and just kind of rushes in. But if something persists over time, your innate immune system, using dendritic cells, and some other ways of communication starts to tell your adaptive cells, which are your B and T cells. And this is where your antibodies come from, like, hey, we got an ongoing problem, feeding you some information. And over the coming weeks, you may need to, you know, build some antibodies or something like that, in the case of maybe like an infection or something like that.

And so, you have these two sides of the immune system, and we want them to fire in proportion to what's happening. So, if they need to use a feather, we want them to use a feather, if they need to use a hammer, we want them to use a hammer, and we don't wanna be using hammers for feathers, and vice versa. Because that's when you get into states of persistent, I think out of tolerance with the environment. These look like you know, allergies to things that other humans don't have allergies to. So maybe like a lot of ragweed or hay fever, or you have some sort of chronic inflammation that just drags on and maybe ends up in autoimmunity, maybe ongoing food sensitivities after you've done, you know, all the basic steps around diet and things like this. So, these are all various symptoms of a misfire, and we can talk about sort of the five different ones. But that's sort of the overview is how like, there can be some breakdowns there.
Katie: Yeah, that's a helpful framework to understand. And I think when you use the word antibodies, often people will think of autoimmune disease, because that's often a thing that's measured for autoimmunity. And I know there's part of the conversation that goes there as well, but maybe walk us through what those five symptoms are. So, we have a passing understanding before we get deeper.

Steven: Yeah, sure. So, on the innate side your body could mount too high of a response. So, this is often seen in something like hay fever, or pet allergies, things like that, right? It could rush in and swell up your entire ankle if it was turned. Instead, we want it to just swell the areas that were affected. So, you could have too aggressive of an innate immune response. And we've also seen this with cytokine storms recently, that's another version of overaggressiveness. We can also have too little of a response, like, let's say there is an infection that's happening, we want the white blood cells to rush in, but maybe they don't, maybe they're kind of, you know, out on their lunch break and not responding. And then you can get wounds that don't heal for a really long time.

The next thing is in people with really compromised immune systems, and definitely elderly individuals, so people like usually over 65 we see reduced creation of antibodies. And so, part of that is the innate immune system's not talking to the adaptive immune system. And so, we can have a poor communication misfire. And then on the adaptive side, we can make antibodies to our own tissues, like our thyroids, you know, and that's a misfire where we're being too aggressive on the adaptive side. And then the other is too passive on the adaptive sides, which is where we're making not enough antibodies when there is like, you know, something out there like a flu or something like that.

Katie: Makes sense. And other obviously, a misfire on either of those directions is not a good thing. But it is telling us something that's going on within the body, which at least then seems helpful to start to correct that response. And I would guess this is some of the reason it's probably hard to generalize when it comes to immune support because not only is it going two directions, but there's so much personalization that comes into play here as well. And I know from personal experience I've gotten through Hashimoto's which is an immune response to my own thyroid, you've gotten through some chronic conditions as well. So, there's hope and it is possible to rebalance these things. But is that why with you know, vitamins, and minerals, and supplements, marketed for immune health you might not always get the effect you think you're gonna get?

Steven: Yeah, yeah, I mean, that's what I kind of...as I was diving into the immune system over the last three years, in the beginning, I was like, "Wow, I just need to take so much zinc, and so much vitamin D, and so much magnesium, and vitamin C. And what I kind of came upon as far as an analogy is like think of a plane and flying a plane from New York to San Francisco, you do need zinc, you do need magnesium, you do need selenium, you need all of these immune supplements, if you will, immune minerals and vitamins. They're like the engines, and the seats in the hull of the plane, like if you lose an engine in flight, you are going, you know, probably going down or something bad is happening.

And so, the same is true, if you don't have enough of the raw materials for the immune system, it can get out of balance, you know, too passive or too aggressive. And what we're looking to do is make sure that the pilots and the flight plan is balanced. And that's where you get balanced in the immune system is you got to have the right flight plan, and the right ability, to correct when there's a windstorm, or a thunderstorm, or something like that. And so that's what we're looking for is relative stockpiling more engines on a plane, you know, we need the right amount of engines, the right amount of wings, the right amount of seats, all that kind of stuff.

Katie: That's a great analogy. I love that.
Steven: Yeah, thank you. Thank you. Yeah, you can, you know, I think that's where people, even myself, I load up on all these supplements. And like, "Please, you know, get over this cold really fast." And sometimes it just doesn't happen as fast as you want. And it's because you don't have those stockpiled nutrients. Other times, it's because the nutrients are there, but there's no flight plan on how to use them.

Katie: Right, that makes sense. And also, I would guess, with some of these, at least, especially if we're talking about something like vitamin D, it is possible to go too far in the other direction and get too much of it. So, with something like magnesium, which it seems like most people are pretty chronically deficient in at least in the U.S. But I'm sure there are some caveats of being careful if you don't wanna overload any of these things or have too much on your plane either.

Steven: Right. Exactly. You don't want four engines on one wing and two engines on the other. Like you do want to be careful when you load up on these vitamins and minerals. There can be damage if you're, you know, going too high. Like you said, like if you're chronically supplementing with vitamin D, but you never get your levels tested. Like that's a way that you could grow out of balance over a year or two. You know, if you've been listening to this show, you've learned about vitamin D for you know, probably six years ago or longer. And if you've been supplementing this whole time, but you haven't checked, you're at risk, you know, that you do want to get some feedback about what's actually happening under the hood.

Katie: Absolutely, and I'm always an encourager to get vitamin D from sunlight as much as possible as well too, because then your body is able to regulate more specifically than if you're taking supplemental vitamin D. But definitely second your recommendation, if you are supplementing with vitamin D get tested at least once a year and see where you're at.

And also, I think when it comes to the conversation of immune health, people often kind of isolate that and think of it in terms of whether they're getting sick, or they're not, or maybe a little bit more autoimmune disease, and within that realm. But I know from your research, and you can explain this much better than I could. The immune system is so intricately connected to essentially every part of our body in various ways, but maybe walk us through some of the ways it is connected to different parts of the body in ways that we don't just naturally always think of when we talk about immune health.

Steven: Yeah, I like to think the more I've thought and studied and tried to, you know, break down the immune system and its relationship to the gut, or the brain, or the lungs, or whatnot, the more I actually begin to think about it as a communication channel. Like I mean, sure it's an organ and whatnot, but it's usually communicating from the gut, or from the outside air, or wherever there's been an input of data, and then it's communicating that out somewhere else. And so, for instance, like eczema and rosacea, are typically thought of as skin conditions. Well, the reason why the symptoms are there are typically deeply related to an immune misfire that's happening on the regular basis, due to loss of tolerance to something in your world, whether that's maybe gluten that you're eating, or maybe that's mold in your house, it's still a loss of tolerance to the outside world.

And then the immune system kind of fires off these inflammatory pathways. And it could end up as you know, eczema or rashes. We also see this in asthma. There's some really cool research around how basically, if you don't have enough, what are called like balancing cells or T cells that balance or T suppressor cells. These things kind of balance the two sides of your adaptive immune system, Th1 and Th2, and if you don't have enough of them, there can be like these violent swings, I think of it like a teeter-totter. And if you don't have enough balance in that teeter-totter, you know, you can get thrown around and it can be kind of painful on the playground.
And the same thing can be true in your immune system and then that could show up like an inflammatory condition in asthma. We see this also in osteoarthritis for the knees or you know, elbows, joints, hands, and fingers. Again, it's almost like, let's say you have a genetic weak link somewhere, you lost tolerance to your environment, and you have a genetic weak link in your thyroid or your elbow or something. And then basically, the gut is telling the immune system, we've lost tolerance, the immune system is saying we've lost tolerance, and it happens to funnel over to your weak link, which in this case, is you know, your elbow, or your knee, or something like that.

And then you experience this as like, "Oh, I have a bum knee, or I have a rash." And so that's kind of why I think of it almost as a communication channel. Because if you just try to target the immune system, or you just try to target the pain point, either option typically doesn't allow you to win. Like if you're just applying topicals for eczema or rashes, you pretty much never win the game, you're always playing Whac-A-Mole, and you don't ever win. If you do topical, and immune, and gut, or something else that might be going on or maybe you get out of the environment, you can't tolerate like a moldy house, then you can actually win the game of getting rid of that thing for good.

Katie: That makes sense. And it makes me think of for instance, and when I had Hashimoto's is it's common for people with Hashimoto's to sometimes swing between hypothyroid and hyperthyroid and like have a differing response, even though the condition is still Hashimoto's throughout. And that would seem to indicate maybe some of those immune system changes happening in either direction, potentially.

Steven: Yeah, if you look in the literature, there, you know, on the Th2 side is typically thought of as autoimmunity, basically, you're making too much Th2 cytokines and cells and things like that. Th1 is typically thought about as like hay fever or allergies to the environment. But as a clinician, if you talk to clinicians who are treating these types of folks, they always not always, but a lot of the time, they find a lot of overlap, like it's very common for someone to have some sort of grass or hay allergy and have Hashimoto's or and have celiac.

And so typically, what I think is happening, at least part of the puzzle piece is not having enough regulator T cells that can kind of help balance it out. And there's always gonna be a little bit of movement on the teeter-totter. It's not like, you know, life happens in waves, like literally seasons and waves like this is how nature moves. What we want though is we want the ability to find homeostasis, or balance, again. It's when we get stuck, or we change too hard, we flip-flop really hard, like, if you've been on a teeter-totter as a child and someone smashes the other side, and you hit your butt on the ground really hard, it does hurt. And so we want that ability to sort of land softly and not go too high. And that's where we need a lot of T-regulatory cells, T-suppressor cells to sort of help that balance. And then that typically is also associated with a increase in the ability to tolerate the environment that you haven't been tolerating.

Katie: Makes sense. And it makes me curious, how do we know this is not something I've heard of, you know, common testing for those things? So as individuals, how do we know potentially like to go back to the plane analogy, if we have too much or too little of something on board?

Steven: Unfortunately, the testing, in my opinion, is really lackluster at this moment. So, there are a few panels from Cyrex labs and Vibrant America, they have some like, high intense like $500 to $800 immune panels, where you can actually check how many natural killer cells do I have? What kind of white blood cells? And how many of them do I have? Do I have a regular amount of B cells and a regular amount of T cells? That kind of lab data is not available that I understand from any of the conventional labs, and your conventional doctor probably has never even heard of these types of tests being available. And so, it's really frustrating.
because it's much easier to even get a stool test or a food sensitivity test these days. This type of testing for your immune system to actually figure out which part of your immune system is underactive or overactive is really rare at the moment. And so, I hope that it will spread with shows like this so that more clinicians run these tests and can help people understand their own bodies.

Katie: And unfortunately, this seems like a common theme of, you know, inability to access adequate testing, and even within testing that it's commonly available. Of course, there's so much with the different types in the optimal ranges. And that could be a series of podcasts all and of its own, even basic things like magnesium are difficult to test for and actually get accurate ranges in the body. But then, for those of us who don't have access to this kind of testing, seems often clinicians will also look at symptoms and/or other factors. So, are there ways that we can get a picture of this based on how our body's feeling or other factors that we do have access to?

Steven: Yeah, yeah. So, 100%, like you said, at this moment in time, symptom tracking and like sort of making a list of symptoms and then zooming out, maybe while you're listening to the show, or maybe rewind and listen to this again, is the next best way to kind of try to analyze what's happening. It's not perfect, but it can tell you a lot. So, for instance, as I mentioned, the literature is really clear that too much Th1 is typically related to grass, hay, dogs, cats, sort of like these sorts of environmental allergies.

So, if you have those, like if you know you've had those, you've done a skin prick test, or you literally just know that "Hey, that plant over there, when it blooms, I feel like, you know, junk for a week." Like that's a pretty good sign your Th1 is out of balance in regard to that environment. Now, if you have an autoimmune condition, or you have markers of autoimmune antibodies from a different test, then that shows you that your Th2 is being hypervigilant, it's too high. And so that's a great marker to tell you that your Th2 system is a little out of balance.

If you're someone who's running an hsCRP, or sed rate, or something like that, that's a measure of generalized inflammation and it's typically running high, that's a sign that your innate immune system is running too high, it's out of balance over there. You can also see that by just looking at someone and seeing like, wow, they have like a puffy elbow that doesn't go down or swelling in a certain area. Like let's say you sprained your ankle, that swelling should subside over a week or two unless it's extreme injury, but some people's lags for six, eight weeks, you know, and it just never really goes down. That's a good indication of like a little passivity on the innate side. So, we can look in the mirror, we can kind of take stock of our body parts. And those are all indications of a misfire in a certain direction. Food sensitivities would be another one.

Katie: Got it. And the other thing I'm really excited to chat with you about because I know you've done a ton of research around is probably a new term for a lot of people. And I've only researched it because of the show notes for this. But the idea of paraprobiotics and how they seem to be sort of adaptive to be able to help in both directions. But for people who have maybe never heard that word before, can you explain what that is? And what makes them special?

Steven: Yeah, yeah. So the paraprobiotics are this new thing out of Japan, about 20 years ago they started doing research on them. And they were really looking into what makes probiotics do different things in the body. And so, paraprobiotics are like immature cells, or baby probiotics that are killed before they become adults. And what this means is that their cell wall, and their receptors are different. And that might not sound like much and that might go against like why you think probiotics help the body. But this research is becoming really, really clear and very exciting, that those are like little pieces of information. They're like the little inputs.
And then when they go into the gut, our gut and our immune system, senses those pair of probiotics, and it will cause these adaptive changes in the immune system, for instance, making more T-suppressor or T-helper cells.

Katie: Got it. So, are there different types of these? Are they more in general categories? Or like what has research identified so far with them?

Steven: Yeah, so there's different types. Almost just like there's different types of bacteria for probiotics, there's like bifidobacterial, there's lactobacillus bacteria. There's spore biotics, these are all different types of bacteria, these various alive kind, so in this case, like a lacta strain. Some of them they've tested as they, if they kill them earlier, that they do different things. And so for instance, in the whole immune product, there's three different strains. One of them is an acidophilus, a lactobacillus acidophilus, which a lot of people may have taken in one of their probiotics when it was alive to try to help their microbiome or try to help their IBS or something like this.

The acidophilus in this product is, like I said, a smaller version, an immature version that's been heat killed. There's also some strains that are like close to what you'd see in like a kimchi or kefir. And so, the adult version does different things. And the immature version does different things as well.

I will say that, in general, the paraprobiotics that you wanna take are ones that have a strain at the end of them. So, they'll say, like a bunch of, you know, names, and then there'll be like a...probably some numbers like, you know, 1517, or LP20, or something like that. That's a really good indication that the person who made that has done the clinical trials needed to prove that this thing actually does something in humans. And so, if you are gonna go into the para-probiotic market, it's still very early, there's not that many options out there. But I believe as it grows, there could be some knock offs. And you'll always want to try to find a para-probiotic that has the strain listed, and then you can find studies on that strain.

Katie: Got it. That's a helpful tip. So, you said these are basically like immature probiotics. So, they basically are carrying information that's interacting with the body differently. Is that what makes them uniquely supportive of the immune system? Or what's happening in that process?

Steven: Correct. Yeah. So, because they're dead, they're not gonna like repopulate, they're not gonna give off any sort of signaling molecules, they're not going to do any of the stuff that like, alive probiotics would do. Instead, what they're doing is they're like taking your immune system back into rehab, like you're in the gym, like a different type of rehab. But you're going back into the gym, and basically saying, like, "Here. Here's a dose of something that you haven't had in a while, and, you know, do these squats to, you know, help build up your legs, because you haven't been, you know, walking in a while or whatever."

And so in a way, paraprobiotics are a little sort of like jolts for the immune system to say, "Oh, there's something new in the environment. And this is causing adaptogenic change to the environment." And then that propagates through the communication channels out to various areas. So, it could go out to one of the studies in the one that's in whole immune is on periodontal pockets, going from like a depth of four, up to a depth of two. There's other studies on eczema, there's other studies on hay fever. And so it kind of flows out through the communication channels. And if you do have weak links in some of these areas, it can help tame those symptoms.

Katie: Gotcha. So, for like the gym analogy, this is essentially like a trainer that's helping correct your form or corrects what's happening in the immune system to sort of have it learn and adapt to what it needs to respond to and what it doesn't. And having the appropriate response?
Steven: Correct. Yeah, that's a better way of saying it. Yeah, it really is helping, you know, correct form, making sure that you're getting your reps in and showing up on a regular basis, because what you just said is the most important thing of all, which is what we want to get back in relationship and in tolerance to our environment.

Katie: Got it. So, it seemed like then, these are probably because they have that sort of adaptive property, they can be almost universally helpful to the immune system, whether it's overregulated in one direction or under, because it's helping retrain what the correct sort of baseline is?

Steven: Yeah, they do seem to work that way. Although each one tends to have its own mechanism of action. And so they, in other words, they're not quite like herbs where some herbs, like adrenal herbs, or whatever, like holy basil or something like that. They can be totally adaptogenic mushrooms as well. These tend to be adaptogenic, in that, when somebody's low or high, it will modify that certain area. Like if on the Th1 side, it tends to bring Th1 into balance, or it tends to bring Th2 into balance, whether it's high or low. I don't know that it can do anything completely across the whole immune system, it seems to be very, like a targeted adaptogen, if you will.

Katie: That makes sense. So, I know this is a new kind of emerging technology. But what have the studies looked at as far as maybe for instance, in like the autoimmune categories or in the more acute immune system response?

Steven: So, the studies, for instance, for autoimmune, what we wanna be doing is again, balancing your Th1 or your Th2 levels, we'd wanna have more T-helper or T-suppressor cells. And so, for instance, one of the strains in the product is called LP20. And LP20, has been shown to basically boost the T-helper cells up and lower something called INF beta. So that's like a cytokine or signaling inflammation molecule. So, the L92 seems to support natural killer cells and less production of Th2, so then that ends up supporting Th1 because there's less of a compensation pattern.

So, there's not been a direct study on autoimmunity, yet. They've been studying more things like, well, I guess eczema if you consider eczema an autoimmune condition. There are studies on the L92 in eczema for kids as well as adults showing improvement in their scores, the eczema scores over 8 to 12 weeks of continual usage. So, there are that most of the studies so far have been going after what's called like lost workdays, which is where they do these studies, either on college kids, where they split 100 college kids are taking final exams, 50 of them get a paraprobiotics, 50 of them get a placebo, and they find out who gets sick and who makes it through all their tests. And the kids who get the paraprobiotic usually do better as far as not reporting getting sick or losing any days. And then they do that in the workplace. They say, "How many days did someone call in sick for the year, or for a time period?" It's usually 12 weeks for most of these paraprobiotics. And the people who take the paraprobiotics report less lost workdays in that regards. They've also been studied on influenza in mice, as well as a few trials in humans to show usually a little bit faster recovery time.

Katie: Got it. So, the research is indicating that potentially these could be used acutely when there's an actual illness as well as for like longer-term balancing of the immune system as well.

Steven: Yeah, yeah. And I would say that I would be leading you astray to say that you would like to have this in your medicine cabinet and just pull it out like a Tylenol, whenever you feel like you're getting sick. That's really not the mechanism of action behind these bugs. What they're trying to do is the whole rehab-trainer thing, we're trying to get you stronger, in better shape, and better form, the next time you encounter, whatever it is out there, whether it's an incoming bug, or that hay fever, or a dog, or a cat, or some sort of food that you normally can't tolerate.
Katie: Got it. Okay, that makes sense. And you've used the word cytokines a couple times, and you mentioned cytokine storms, I think that term has become much more mainstream, known in the last couple of years. But for anybody who maybe has only heard that word and doesn't fully understand it, or maybe hasn't even heard that term yet, can you explain what that is, and maybe how these come into play?

Steven: Yeah, so cytokines are a giant group of signaling molecules in the immune system, they signal all kinds of things, there's many of them, I actually don't even know how many there are, they probably are still finding them at this moment. And so, they're signaling molecules, so they kind of say, like, "Hey, go down this pathway and create more inflammation over here, or go down this pathway, and, you know, send it over to your foot, or whatever it might be." And so, we need cytokines. Cytokines are not bad, but we need them in proportion to whatever's happening.

And so, what we've seen is that out of balance immune systems in relation to something like a virus or potentially some other entity that's being injected, you can have a overcompensation, your body is like, "Holy cow, there's an evasion going on." And rather than, like I said, responding with a feather, it responds with a bunch of hammers. And a cytokine storm is basically way too much inflammation going down all the pathways at once. And it can lead to death in some individuals. And so, what we're hoping to have happen for a healthy human is just enough cytokines to let everybody know, there's an evasion happening, you know, dust off your hard hats and your boots, get ready, we got to go to work. But if it's persistent and ongoing, it doesn't get shut off. That's where you end up with these, you know, really sad stories in the news.

Katie: Got it. Yeah, the analogy I think I used to explain them to my kids is one of my sons plays tennis and tennis requires a specific amount of, you know, pressure when you're hitting the ball. And for whatever reason, my brain goes into like survival mode when I see a tennis ball coming and I like, swing with everything I have and the ball never stays in the tennis court. And so, I'm like, "Me playing tennis is kind of like a cytokine storm, where I'm way overreacting to the thing that's actually coming at me," which I think that helps them understand it.

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This episode is brought to you by Four Sigmatic, the company that first introduced me to functional and medicinal mushrooms and whose products I've been using for almost a decade. Mushrooms are absolutely fascinating, being genetically closer to humans than to plants. The largest organism in the world is a mushroom and they allow trees and plants to talk to each other using something called mycorrhizal networks. Many types of mushrooms are also well studied for the benefits to humans, and widely used in many ancient medicinal traditions and cultures. Researchers has found that mushrooms have high amounts of ergothioneine and glutathione, both important antioxidants, that help fight age-related decline. I love eating culinary mushrooms but sometimes it can be hard to work them into my everyday diet, and specific mushrooms have additional more targeted benefits. That's why I love Four Sigmatic products. They have a wide variety of beverages that incorporate these amazing superfood mushrooms and that taste amazing. On a typical day, I’ll drink a cup of their mushroom infused coffee or matcha with ingredients like Lion’s mane for focus or cordyceps for overall health. I also love winding down with a cup of their Reishi elixir, which helps me fall asleep easily and get more restorative deep sleep. I especially love their packets on the go because they are so easy to throw in my purse or my bag when I travel, and I’ll often just order a cup of hot water on the go and make some Lion’s Mane coffee on a plane. I also love mixing a packet of their coffee or matcha into a protein drink on the go for a protein-packed iced latte option. Speaking of protein, they have the only plant-based protein I like, with 7 functional mushrooms and adaptogens and the flavor is great. Check out all of their products at foursigmatic.com/wellnessmama and use the code wellnessmama for a discount!

Katie: What are the gut-specific implications of paraprobiotics? And it makes sense that they're like an adaptive long-term thing? Do we see adaptive gut changes over the long-term as well?

Steven: So far, this is the first product on the market that's ever combined three of them together. So, the product contains three of them with beta glucans. So, beta glucans, have been around for a long time. It is used for immune support across both persistent long-term immune issues as well as acutely. We know that it kind of re-trains your secretory IgA, which is like your big defense mechanism in your gut, and kind of makes it more fit or more able to respond. With this product because there's three of them. We can't say that it's been "studied," but what we're seeing is that since 80%, or approximately 70% or 80% of your gut cells are right around or your immune system right around the gut, it tends to be interacting, I believe with these changes are happening in and around the gut.

And what we see, at least in our customer reviews, and the calls, and emails we get is that people who have, say food sensitivities and they've done elimination diets, they maybe they take enzymes, or they're on a probiotic or something, but they just can't quite introduce everything they want. Maybe they just can't quite get broccoli back into their diet or garlic, or some other FODMAP. These seem to allow the immune system to relax enough to allow a lot of the other foods in.

And we also see benefit with people who have a lot of histamine-related gut issues. So, you know, some people can't do red wine, or high histamine-related food like leftovers. And so, for these folks, after they've done a low-histamine diet, and after they've done some healing about whatever was causing their histamine issues, they oftentimes have a hard time reintroducing regular foods like red wine back into their diet. And this product seems to help them again, find that tolerance. So, the whole like, trainer idea for your gut immune system I think is really on point with this.

Katie: Got it. And so, can you explain a little bit more about the three strains specifically that you chose and why you chose them? Because like you said, this is the first one that has those three, is the only one I've tried,
and I definitely noticed the results. I'm curious, like, what are the three? And what specifically are they studied for so far?

Steven: Yeah, so the like, I would say the all-star is called a Immuse. And Immuse is a lacta-strain. And what the cool thing about Immuse is, is that it is truly adaptogenic on both the adaptive and the innate side, because in studies, it's been shown to boost something called plasmacytoid dendritic cells. And these are these crazy new cells that I think people are learning about, that are what they're calling the leaders of the immune system. They're almost like the marionette hand where they can sort of sense in based on what's happening in the body. And they can upregulate natural killer cell production, they can down-regulate it. They can boost stuff on the T-helper cell side again. So, there's really cool like pDCs are these really cool things, they can get wonky in autoimmune conditions. So if you Google it, you will see some, like kind of inflammatory articles out there. That has not been the case with Immuse. It's been studied up to 5x the dosage that's in the bottle, and there was no adverse events.

So, what Immuse has been studied for is specifically studied for like all year-round wellness, it's been studied and shown to boost athletic performance, improve skin dryness. And the lost workday thing I was talking about earlier.

The next one is something called LP20. And LP20, helps improve Th1 to Th2. And this is the one that they did human clinical studies on periodontal disease pockets, which is kind of crazy, right? You're basically taking a capsule with a dead...a bug in it, and it's changing your gums. And that's, that's really cool. It really, it's just kind of mind-blowing, when people are like, well, doesn't it have to be in my toothpaste? Or doesn't have to be in my mouthwash to change what's happening, you know, inside my gums? And the answer's no, which is really cool. And really interesting, I think for the future of, you know, oral health and things like that.

The third one is lactobacillus L92. This is the oldest one, the one that's been around the longest, and the one that's been studied on eczema, and again, hay fever. So, this one is, I think they got it out of Kefir, like many, many years ago, and then they've been playing with it since then. And this one helps balance Th1 and Th2 as well. But the best studies are the ones on the kids for eczema and the adults for eczema. And again, it's not a treatment for eczema, it doesn't like totally fix any of this stuff. It just helps move them down the scale, helps them with the rashes and the dryness.

Katie: Yeah, I find the oral health side so fascinating only for me personally, that's been a really just pet research topic for over a decade. And first kind of delving into the idea of tooth decay being more of an internal problem than just what's sitting on our teeth while we sleep. But then really getting into the world of understanding how so much of the immune system begins and lives in the mouth. And we know the gut part, but that it really also stems from the mouth side as well. And so, I find that really fascinating that they did study specific to that and notice the change, which I think hopefully we'll continue to see more and more research about that. I think a lot of dentists still take the kind of band-aid approach or just look at topically just like we do with eczema like oh, we'll just put something on the skin. But no, it turns out the internal is even more important.

And with the mouth one example I give you know, is that's why people with certain heart conditions they will give them antibiotics when they have dental work because the oral health is so connected to the whole body that can actually be an immune event for them. But when we understand that, it shifts how we think of oral health and also, I hope it's encouragement for people not to use overly harsh, antiseptic mouthwashes that are killing the oral microbiome and the beginning of the immune system in the mouth as well.
Steven: Yeah, yeah, totally. And the analogy of the airplane kind of works for the mouth as well, right? Like, if you don't have enough minerals, you're really not gonna have great tooth health. But you also have to have that immune signaling to handle what's happening in the mouth on a regular basis as well, because it's part of the digestive tract. There's a lot of exchange of information in an environment in there.

Katie: So, it sounds like there's a lot of use cases for this. Who is this most recommended for? People to take Holoimmune, and also are there any contraindications or times when people would not wanna take it?

Steven: So, I would say the best rav-y like, reviews we've gotten so far, are folks with rashes, and skin-related breakouts, things like that, that they've already tried, or they do have like a good routine, they're tying with a good diet, things like that, and they still haven't quite figured it out. So those folks seem to report a lot of success. People with neuroinflammation seem to be helped. There's a lot of growing data that suggests part of what happens in an inflamed brain starts in the gut, and then travels up the vagus nerve into the brain. And so, for instance, Shay, my fiancée loves HololImmune, because she takes two a day and she can like beat her word game, you know, she plays those word games. She's like, twice as fast at the word games.

And so she thinks that, you know, or she knows that it helps her brain, I unfortunately, was hoping to get that benefit. But I don't seem to have that immune dysregulation. I guess that's probably a good thing. So, but there is a growing group, typically women over 40, who get a lot of help from taking it in the neural area. And then the last part is those folks with the food sensitivities. And some of them are histamine-related, some of them are not, but they just struggle with food sensitivities, and trying to get their diet back to what I would call like a resilient diet where you really have choice like, do you wanna have a little, you know, do you wanna get a little sloppy on vacation and have a few, you know, seed oils or something prepackaged because you're out on a date or something like that.

And so trying to get that last bit of tolerance back, for folks who struggled maybe on the autoimmune side, or the IBS side, or whatever it is, it does seem to kind of give them that last hope of...or that last piece of freedom back.

Katie: Yeah, I think that's a key and something I learned the hard way, sort of through my own health journey, as well as like, it's one thing to be healthy when you're in a narrow range of inputs and just like super control every one of those inputs. But to me, like the full expression of health is much more the adaptability of being able to handle whatever inputs come at you and still choose the best ones most of the time, but have the freedom to deviate sometimes, for reasons that you would want to and not have negative effects.

And so I love that this seems to very much dovetail with that in supporting the body as a whole. Are there other things people can do complementary to this that helped make the immune system smarter and not just stronger? Like whether it becomes from a food perspective, or a nutrient perspective, or lifestyle perspective?

Steven: Yeah, I mean, so from a lifestyle perspective, this is like, where I get to stand on my little soapbox for a minute and say, "Get your hands dirty and don't wash them." You know, you don't have to wash everything, you don't have to use antibiotic soap on everything and walk around with your hand sanitizer. I know, it's a scary world out there, from bugs and all kinds of things. But in general, so, like you said, the more we put ourselves in a small, contained glass box, the more we're stuck there.

And what I'm saying is literally the loss of being in the environment, you know, touching the ground, touching your mouth, you know, getting the microbes from dirt, or your pets, or something else in and around your face is part of this loss of tolerance. Now, I'm not saying stick your hand in poop and you know, put in your mouth. I'm not saying like, don't be dumb about this, but I am saying that we are over-washing and we're not
gardening enough. We're not going out for walks and looking at flowers or leaves. And then just going about our lives without washing our hands.

So first one is get outside, get into nature, smell the smells of nature, all that is input. That's all data as well all the leaves decaying, the leaves budding in the spring, that's all helpful to your immune system. Yeah, there's cool studies in Japan where basically they have like really stressed-out anxious, sometimes hypertensive people and they literally prescribe them forest bathing, and what they believe as that certain trees give off pheromones, just like humans attract each other with pheromones.

So, these like crazy sense that we can't really register but just by breathing them in for 30 minutes a day, or 30 minutes a week. You can start to down-regulate high blood pressure and some other things. So, get outside you know, don't wash your hands all the time. And then the other thing would be just eating a diverse diet. So, if you can get fermented foods in your diet like kimchi or sauerkraut, this is also data, this is helpful for tolerance of your immune system, it's helpful for generating the right appropriate response to kind of a wild type of food. I mean, in a way it is. It's sort of an uncontrolled fermentation. And some days it's more fermented than other days. And so that's actually really good. That's training your immune system and helping with tolerance as well.

Katie: I love that advice. And I often recommend on here, the practice of just as soon as you wake up in the morning as soon as possible, going outside and getting sunlight ideally in nature for a lot of those same reasons. And also, we know the implications now of that helping your circadian clock and starting the clock for bedtime and melatonin production. But I love that you mentioned just get dirty. And don't be afraid of it, especially for the moms listening. I think this is really key for kids immune systems developing well, as well.

And I think of...I once read about Arnold Schwarzenegger swore that one of the keys to his immune health was that he would go to the gym and workout touch the equipment that so many other people had touched, and then not wash his hands and go eat lunch. And that sounds probably crazy to a lot of people listening. But that was a practice he did but maybe less extreme. The ones you mentioned, just getting out in the garden, especially like my garden I know where the soil came from. And I know it's from mushroom compost. And there's all these beneficial bacteria that live within the soil. There's no need to go sanitize your hands before you eat or sanitize the food that you just grew, rinse it off, get the actual dirt off, but you don't have to go to the extreme measure. I would guess this is also the reason we see in the data that having pets that kind of go in and outdoors actually has a beneficial immune component for people and I have had actual doctors recommend if you have kids have a pet in the house, because you're getting more immune inputs.

Steven: Yeah, yeah, there's plenty of data on kids that grew up on farms, and kids that grew up in cities, and the kids that grew up on the farms with other animals, they end up having more resilient immune systems, they have less food sensitivities, less autoimmunity. So yeah, all those different inputs are super important.

Katie: Oh, I love that. And as we get close to the end of our time, of course, make sure that I put links to more research about all this so people can continue learning it as well as to the HololImmune product for people who wanna see the results themselves. But a couple other questions, I love to ask for the end of interviews, the first being if there are any book or books that have had a profound impact on your life, and if so, what they are and why

Steven: I think the book that comes to mind right now is a "Man's Search for Meaning" by Viktor Frankl. And I've read it, I mean, probably every other year for at least 15 years now. And I think it helps me kind of remember that, while I have lots of problems and lots of scary things happening for my life, it's really not a
total problem usually, it's just kind of a challenge, or it's an annoyance, or a disturbance. And so, I think that book really helped me also realize, I think something else about immunity, which is, you know, in that book, the people who were sort of present and had something to live for or a reason why they were doing what they were doing. They tended to survive, and the people who needed them to be liberated by a certain day, or get out of there, or have the conditions be a certain way for them to live. They typically died even though they were healthy, and like physically healthy. And I think that's also something that can happen both in life and immune health, and helpful for me.

Katie: I'm a big fan of that book as well. I'll link to it as well, in the show notes for all of you listening. If you haven't read it, I highly recommend it as well. And any parting advice for the listeners today that could be related to immune health and everything we've talked about or entirely unrelated?

Steven: Yeah, I mean, I will say the last thing in immune health is sleep and melatonin is super important. And the research on vitamin C and vitamin D is like really legit. So, you know, I do have a section of my house that has like the you know, the "Oh, crap" moment of like, "Oh, no, I got that feeling in the back of my throat or that sniffle." And so, there is some really, really good data on vitamin C usage as well as melatonin usage actually, for the immune system for modulating it. And this is probably also the reason why like a really common recipe for getting sick is like get really poor sleep for I don't know, a week or two and then have something stressful happen, like a bad day with, you know, at school with the kids or something else and then boom, you're sick.

And so, melatonin is super important for the immune system. And so is vitamin C. So, I do think you know, having those around and knowing how to dose those for yourself and for your kids is a really good idea to have as well.

Katie: Yeah, great point and maybe to also look back to that recommendation of get early morning sunlight outside whenever possible. And also, the reason I have things like blackout curtains in my room, and optimize sleep temperature, and all of these things we can tweak with very little effort that improves sleep quality. I think that's been a constant in the research for the past few decades, we know without a doubt that sleep and stress play a huge role in every aspect of health, yet they seem to be still an elusive thing to optimize for many of us.

So, I think anytime we can improve those a little bit, it goes a long way. And then to be able to add on things like HololImmune, and things that we're now studying and seeing can also further benefit. It's always to be a both/and improve the foundational and do these other things. But the end of the day, we can't out-supplement or out-diet, a lack of sleep, or a lack of dealing with stress.

Steven: Hundred percent.

Katie: So, it's such an important reminder. And it's always such a joy Steve to get to chat with you. I hope we get to do it again soon. And I think we're gonna talk about magnesium pretty soon so you guys can keep an eye out for that one. But for today, thank you so much for your time. It's always such a pleasure.

Steven: Yeah, thank you, Katie. Thanks for having me on.

Katie: And thanks as always to all of you for listening and sharing your most valuable resources, your time, your energy, and your attention with us today. We're both so grateful that you did, and I hope that you will join me again on the next episode of "The Wellness Mama" podcast.
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