Battling Pathogens and Building Immunity Begins In Your Gut – Dr. Robynne Chutkan – #998

Dave Asprey:

You're listening to the Human Upgrade with Dave Asprey. In this episode, you're going to learn some really cool stuff. You might have heard me talk about the microbiome maybe once or twice or a lot because it's a cutting edge for biohacking. But there's some stuff going on that you probably haven't heard about that has to do with your antiviral defenses in your gut. Most people talk about biome as being, it's the gut bacteria, obviously, but when you really look at it, there's a viral situation in the gut, there's a parasitic situation in the gut. There's a fungal thing happening in the gut, a whole fungal biome and there are even phages which are basically little parasites that eat bacteria. So it's a jungle in there.

And we're going to go deep into exploring the jungle, specifically looking at the antiviral defenses that are there and what you can do to basically outperform pharmaceuticals when it comes to fighting particular viruses, but not in any particular way that would be related to any government-mandated viruses because it's rude to talk about those and only the worst kind of person would ever mention that by name. I, for one, support our new AI robotic overlords. I just wanted to make that really clear. Our guest on today's show is a true expert in this, because about 20 years ago, she founded the Digestive Center for Wellness to help people figure out what's going on with their guts. I probably should have talked to her 20 years ago when I swallowed an electrical stimulation pill from Russia that shocked my gut in order to try and heal whatever the heck was going on with me. That turned out it was about mold.

She wrote books about the gut and the gut microbiome that started publishing a decade ago, something called The Microbiome Solution and her newest book is The Antiviral Gut: Tackling Pathogens from the Inside Out. Her name is Dr. Robynne Chutkan. Robynne, welcome to the show.

Dr. Robynne Chutkan:

Thank you so much for having me.

Dave:

Well, you spent 20 years looking at this problem. Is this because your own gut was screwed up or you just got fascinated when you were your chief resident at Columbia College?

Robynne:

No, no. Well first of all, speaking of chief resident at Columbia, when I went into gastroenterology, so I finished medical school 31 years ago, 1991, and when I decided, yes, yes, I'm old, I'm wise, but when I decided to go into gastroenterology, all my friends were like, "What? You seem like a nice girl. You want to spend your day waiting through stool." Gastroenterology 30 years ago was not the cool thing, field, cutting-edge [inaudible 00:03:06] medicine that it is now. And the microbiome really wasn't on anybody's radar.

So it didn't have the cool kids glow that it has now and the microbiome really wasn't on anybody's radar at all. And gastroenterology, it's a lot of scoping, doing upper endoscopy, colonoscopy. We deal with autoimmune diseases like Crohn's and ulcerative colitis, polyps, gallstones, all stuff you can see and touch and diagnose pretty easily, but my discovery of how important all of this is really, it was a result of the birth of my daughter. So I was moving along, I was full-time faculty at Georgetown Hospital, practicing very conventional gastroenterology, which means doing a lot of procedures, prescribing a lot of medications and not really thinking about why people had ulcerative colitis or why people got colon cancer or any of these things, but we had good treatments. So we knew what it was and we knew how to treat it and we weren't really asking a lot of probing questions beyond that.

So about 17 and a half years ago, I was having my first and only and beloved child and had a very uneventful pregnancy. And that spring when she was born, it was in the middle of a flu epidemic and I had the flu and I had a fever and it was pretty clear, I wasn't super sick. It seemed pretty clear I had a viral illness. But when I went in, it's this whole series of things that happen. The first thing is labor is long and they then label you failure to progress and start talking about a C-section. And then they put you on drugs to speed up labor. Now, one could argue that a process that takes 40 weeks to happen should not be sped up, but that may be for another day that nature knows when this is supposed to happen. So you get labor-inducing drugs. And of course, the labor-inducing drugs make you more likely to have a C-section.

Now, I'm a physician and I didn't know that. I know that now, but I think there are plenty of people out there who may be offered these things and not aware that, "Okay, it's great. It's going to speed your labor up." That sounds good when you're in pain, but they don't tell you the flipside, is you're more likely to have a C-section. So I ended up having a C-section. Now, normally the baby, as you know, Dave, comes through that birth canal, that's a nice way of seeing the vagina, and as a baby starts to come through the birth canal, the head turns posteriorly. Why does a baby's head turn posteriorly as it's being born? It turns posteriorly to face the tush so that it can swallow a mouthful of microbes in that somewhat germ-filled area between the vaginal opening and the rectal opening that we call the perineum. And that is all very intentional. Babies swallow some mouthful of microbes.

Dave:

Wow.

Robynne:

That is one of the most important moments in our life. That's when the baby becomes colonized with these founding species, the mother's bifidobacteria, etcetera. And what we see is that babies that are born vaginally are colonized with the mother's healthy microbes. Babies that are born via a C-section like my daughter was colonized with hospital-acquired staph, Staphylococcus aureus. And I don't think you need to be a microbiologist to know that hospital-acquired Staphylococcus aureus doesn't sound like the kind of organisms you want to start your microbiome with. And in fact, we see these differences. Babies born via a C-section have higher rates of obesity, of asthma, of autoimmune diseases and allergies. And those risks stay with them for several years.

So the other thing, and again, I didn't know this until I had a C-section, when they take ... So the C-section, they slash and pull the baby out. They then sterilize the baby. So your baby has missed out on swallowing that mouthful of microbes, right? And now they're like HexaDerm or pHisoderm, whatever it is they're sterilizing the baby. And again, C-sections save millions of lives, mother's lives, baby's lives for sure, but C-sections are now done in about almost one in three births in the US and higher in some countries. And many of them are not done to save the mother's life or the baby's life. They're done for commerce and they're done for convenience. And they're still, I think, not a high sense of urgency in terms of understanding these significant differences that being born via a C-section will have versus being born vaginally.

So that was a beginning. My daughter also wasn't able to be nurse very long as a result of all the antibiotics I was given and she was given at birth just in case my breastmilk dried up. So she pops out C-section, gets sterilized and then goes up to the neonatal ICU for observation just in case.

Dave:

Wow.

Robynne:

Because of my fever, they decide to give her some pretty hefty doses of intravenous antibiotics just in case. And so we get out of the hospital, breast milk dries up after about a month, which is not ideal because we know that there are things in breastmilk like human milk oligosaccharides that are there to feed the babies bacteria. And so babies that aren't getting that, also their microbiome doesn't develop quite as robustly. So that began a four-year process of her just being sick all the time. She was either constantly recovering from some sort of air infection or strep throat or something, about to be sick or in the middle of being sick.

And even though I'm a physician, I was a new mom, so I didn't realize that 20 courses of antibiotics by age two is really abnormal and it took ... So she constantly had an air infection, a cough, a cold. And when she was about four, we were getting ready to travel, she was sick again. My husband insisted on taking her to the doctor. And at this point, I was like, "Yeah, I'm not going." I boycott a very well-meaning pediatrician. And she came home with a nebulizer machine and a new diagnosis of asthma and poor prescriptions, a steroid, an antibiotic, a bronchodilator and an antihistamine. And I took it all, I remember I took everything, I put it in a box and I marched it up to my attic. And when I went in to see the pediatrician, I went in with my little file of antibiotic receipts and I was like, "Do you know she's been on more than 20 courses of antibiotics?" And the pediatrician in fact did not know. She was pretty surprised because you know, go in and they look and they say, "Okay, what was she on last time?" and they prescribed something.

And that was for me, Dave, really this aha moment of realizing that this course she was on of frequent antibiotics and frequent infections was going to lead to a bad place. It was going to lead to the place where a lot of my patients were, which is autoimmune disease, obesity, diabetes, etcetera.

Dave:

I was on antibiotics for 15 years, just about every month because of chronic strep throat and infections like that. That certainly has to do with the microbiome and all the autoimmunity and all that stuff and I was obese. So it's totally real, but a lot of people listening don't know about a condition called PANDAS. When kids get strep throat, one of the proteins that's on streptococcus can create an autoimmune reaction to parts of the brain that creates a behavioral situation that looks a lot like autism, but maybe with more OCD. And I did have OCD as a kid, so I don't know if I had PANDAS or didn't, but whatever it is, that's gone. But it's so dangerous and no one talks about it really.

Robynne:

It really did-

Dave:

Did your daughter end up with that or did you get it in time?

Robynne:

No, we got it in time because I really realized, and again I'm lucky that as a physician I had the foresight to be able to say, "Okay, we're not going to the doctor." I always say I'm not advocating don't go to your pediatrician, but you got to ask some probing questions. Studies show that pediatricians prescribe antibiotics about 63% of the time when they think that a parent expects it and 7% when they don't. So I always say be the kind of parent who does not expect it and ask those probing questions, "Is this antibiotic absolutely necessary? What would happen if I didn't take it or my kid didn't take it? Are you using it to treat an actual infection or a suspected infection? Is this infection viral?" all of these things.

So this whole what you're describing, Dave, of antibiotic-injured is very real, very real. And there was a study just from two weeks ago that showed that not only do early antibiotics potentially create childhood obesity, but the frequent infections themselves can by disrupting the microbiome. So it's one of those things where understanding that when you are on frequent antibiotics, you are actually increasing your susceptibility to infection because you're killing off a lot of those healthy microbes. The startling statistic is that about five days of a broad spectrum antibiotic can remove up to a third of your microbiome and this is really problematic in those first thousand days of life.

I would say the microbiome is tender for about the first 10, 12 years, but the first three years it's really tender. And so knocking it out with antibiotics at birth after a C-section delivery really handicaps someone. So we stopped going to the doctor for a period of time. And when Sydney was sick, I'd give her ... I'd make some broth and give her green smoothies. That was back when I could still get her to drink green smoothies, [inaudible 00:13:06].

Dave:

She wasn't that pumped.

Robynne:

She wasn't, 17 and a half and on her own program. But yeah, she was definitely sickly for still a couple years, but then this remarkable thing started to happen, which is her microbiome started to recover and she really gained so much resilience and just became a normal healthy kid. And so it really opened my eyes. And as much as I wish I could have a redo for that one with a home birth and no Pitocin and C-section and all of that, because again, it's great for when you really need it, but I'm not convinced that I really did. But I really started to connect the dots between my patients with Crohn's and ulcerative colitis and celiac disease and asking them. And right around that time, a huge meta-analysis came out from the institution where I did my GI training from Mount Sinai. And that study showed that antibiotics in early childhood were one of the biggest risk factors for developing Crohn's and ulcerative colitis.

And I started asking my patients, and sure enough, so many of them had a history, like yours, Dave, of frequent antibiotics because they had chronic strep or they had chronic antibiotics for posterior urethral valves and they were getting UTIs. And of course, it's that interplay between genetic predisposition, what's going on in the microbiome, and of course, other environmental triggers and diet is a huge one. And of course, as a kid, when your palate typically is wanting sweet, starchy stuff and then the antibiotics are driving you even more in that direction because they're killing off a lot of the healthy fiber-eating bacteria and increasing the amounts of the bacteria that are really interested in the sweet sugary, starchy stuff, so then that further compounds it.

And so now we see, we actually have the clinical data behind all of this, right? But 17, 18 years ago, people were like, "What do you mean you're not taking ..." It was just very woo-woo, but it is so crystal clear. And every day in my feed of gastroenterology articles, I see a new article validating this stuff. There was an article from back in August, researchers at Hopkins linked Clostridium difficile to colon cancer. So we know that Clostridium difficile is a bacterial infection that you get typically if you can get it if you're on antibiotics or in the hospital and it kills about 30,000 people in the US every year. And so here is a direct link between Clostridium difficile infection and colon cancer and you think about how both the bacterial infection as well as a treatment for it changes the ecosystem in the gut and we know that tumors have their own ecosystem. And so it's really a fascinating link between what's going on in the gut, how antibiotics can modify that negatively and then the things that can develop. So not just autoimmune disease but tumors and other things too.

Dave:

Okay, I have a weird question, but you're a gastroenterologist, so I get to ask. Babies are born with their mouth looking at the bum because they need a mouthful of microbes. When a more grownup person has taken antibiotics, wouldn't the same kind of behavior, but maybe not with your mom be beneficial?

Robynne:

It's not a weird question. My husband asked it. He was a C-section baby. He was like, "Could I be reborn?" I was like, "Yeah, not that way." So here's a thing. It's an excellent question. It's not weird at all. It's very intuitive. Here's the thing. The microbiome is various. I said it's very tender early on. It becomes more fixed as adults, when we get antibiotics, the good news is our microbiome is a little more stable, not a ton, but a little more and we can still modify it. The more constructive way in terms of the more, the way that's more productive is to feed the microbes that are already in us to change our diet, so whether you're adding in some fermented foods, more fibrous foods, etcetera. But when you look at stool transplants, which is what that is, so whether we're doing an FMT, fecal microbiota transplant, whether we're doing it by fancy way, enema, I'm doing colonoscopy and sporting somebody else's kind of super juice stool.

Dave:

I've come close to doing a fecal transplant years ago, but I never did.

Robynne:

And that was probably a good decision and we can talk about why, but whether you're doing it that way or you're doing it with stool capsules, that's what that is. And there are tons of animals in the wild. Pandas do it, elephants do it, a lot of different animals do it where they eat the stool of the elders, but it seems-

Dave:

My dog will eat any stool. I figure that's why.

Robynne:

Yeah, and puppies though. But as the dogs get older, as animals in the wild get older, they do it less. So it seems that there's a period where there's more opportunity for change by ingesting microbes, stool transplant, etcetera and then it becomes a little more resistant.

Dave:

Okay, got it. So the oral roots recreationally is not a great idea because your gut bacteria would be resistant and plus you would want to know your donor, so to speak.

Robynne:

Yeah, you got ... There's some other stuff you can get. You can get hepatitis. You can get some other not so great stuff.

Dave:

Yeah, you'd want to have a stool sample before you did anything like that, whether it was FMT or what I'm just going to effectively say is the oral route. And so that I think answers a question that certainly has

been in the back of my mind, "Why do I have to put it in the back door? And why would it have been a bad idea for me to get a fecal matter transplant or fecal microbiome transplant?"

Robynne:

Because of this whole idea of the microbiome ... Well, couple things. Number one, your transplant is only as good as your donor.

Dave:

Why would it have been a bad idea for me to get a fecal matter transplant or fecal microbiome transplant?

Robynne:

Because of this whole idea of the microbiome ... Well, couple things. Number one, your transplant is only as good as your donor. So sort of like a solid organ transplant, right? If you're getting a liver transplant and you're getting it from an 85-year-old drinker, it's not going to be very successful compared to if you're getting it from a 30-year-old who was super healthy and died in a car accident. So we see that we have kind of super poopers. And so depending on what you're trying to overcome, you need to make sure that you're getting high levels of those specific bacterial strains. And if your donor didn't have them, you're not going to get them, number one. So it depends a lot on the quality of the stool.

Dave:

So I was going to get Tom Brady's stool. Would that have been good?

Robynne:

I don't know. I take Gisele. I'm with Gisele's stool on that one.

Dave:

That was a South Park joke. I don't know if you saw the South Park fecal matter transplant episode, but anyway, if you didn't see it, you need to because of your profession.

Robynne:

No, I'm aware on that, but given the current Tom-Gisele situation, plus she's the one who got him started with the healthy-eating people.

Dave:

Fair point.

Robynne:

Yeah. So the other thing is that just doing a stool transplant, one and done, that stool, especially if you do it the oral route, you have high levels of acid in the stomach ideally and so a lot of those bacteria don't survive through the stomach, the acidity, getting down through 20 feet of small intestine into the colon where you need them. And that's why going the back door makes a lot of sense in terms of making sure those bacteria survive. But let's say they survived your stomach acid and they make it down to the colon. In order to have meaningful repopulation, you need to feed them a certain way, right? So most of

the time we're trying to increase a population of bacteria like Faecalibacterium prausnitzii, F. prausnitzii, because that's one of the ones that's associated with making a lot of short-chain fatty acids, great for immune response, etcetera.

But if you're not feeding F. prausnitzii lots of plant fiber, then you're not going to really cultivate a large population. So the one-and-done stool transplant works really well for things like C. diff because that's a one-time infection you're trying to overcome. But if you're trying to overcome something more chronic like an autoimmune disease, then it is repeated stool transplant. So it might be two or three a week for several months and then it might be a maintenance of one or two a week because you're really trying to overcome a significant disruption in the microbiome and its dietary change.

One of the reasons that a lot of the studies looking at FMT for different conditions, Parkinson's, autism, etcetera, even Crohn's and ulcerative colitis, one of the reasons why a lot of those trials haven't been as successful is, a, they've been one and done which is unrealistic. And, b, there's been no dietary change. So there's a study from India a couple months ago for ulcerative colitis where they did the FMT plus dietary change and that was leaps and bounds more successful. So you have to think about what we're feeding the critters to when we make the change.

Dave:

So then your diet after you get FMT, should match the diet of the donor if you wanted to get the results, right?

Robynne:

Absolutely. It should match the diet of whoever cultivated these super microbes.

Dave:

Okay. I like that and it makes so much sense. All right, let's talk about viruses because so many people ignore the viral component of the gut. How common are viruses in your microbiome?

Robynne:

We have about somewhere between 30 and a hundred more bacterial cells than human cells and we have about a hundred more viral particles than we have bacteria. So I think the latest number is more than stars in the universe, somewhere around 380 trillion by last count. We have a lot.

Dave:

Viral particles, right? Are viruses alive? I first can't believe it.

Robynne:

No, they're not alive. It's inanimate.

Dave:

You're in the they're-not-alive camp. I'm with you, but there are some people who claim they're a lifeform and it's just-

Robynne:

Well, I think they are ... Yeah, I agree with you on that. There's something between dead and alive, right? And they get reanimated, and of course, they have these long latent periods and then they get reanimated, but they require, of course, a host, right? Animal, human, plant cell.

Dave:

They're like programs without a computer to run on.

Robynne:

Yeah.

Dave:

So they're not active, but they could be. So yeah, it's one of those things where are they a lifeform? Do they evolve? They do evolve. And if they're running, they're alive, I don't know, but whatever the deal is, there's more of them than bacteria and more of them than cells in the body and probably more of them than mitochondria in the body, given the numbers you talked about.

Robynne:

Yup.

Dave:

So they're omnipresent. And how well do we understand the variation between the viral account and the viral types in different people?

Robynne:

I'll say not well at all, but what we do know is that about 10% of our own DNA is viral material because viruses have been infecting us for millions of years. And so over time, well, humans probably a little less than that, but over time, so if a virus infects a reproductive cell, like a sperm cell, of course, it gets into the cell, hijacks the machinery and gets it to start replicating copies of itself. So if it gets into a sperm cell or an ovum, then it can get passed down and become part of the genetic material. And so somewhere about 7 to 10% of our genetic material is derived from viruses. And some of it does really important stuff like involved in making placental proteins, involved in how we encode memory. So this idea of viruses have definitely gotten a bad rap.

Dave, it's like what we saw with bacteria. Remember when everybody was selling antibacterial bathtubs and antibacterial mattresses and antibacterial everything, makeup, and now, it's like, oh, probiotic makeup and probiotic ... So we're in that same ... We're not on the upswing yet, right? We're still thinking this scorched-earth approach, "Viruses are terrible and they're out to get us." And there's a famous epidemiologist who said, "If we had no viruses, the world would be a great place for a day and a half and then we'd all die," because they're involved in some of these important ecosystem activities, right? With the salination of the water, and of course, maintaining plankton levels and all sorts of different things that we don't think about.

Dave:

Do you know about one of the original uses of Lysol?

Robynne:

No, tell me.

Dave:

It was marketed for, and I'm not even kidding, it was antiseptic, right? But they marketed it for women for vaginal use because you wouldn't want to have any bacteria or viruses or any kind of natural human smell down there. And that was a real ... You can find the ads online and they're a matter of historical record-

Robynne:

No, I believe it because the douches, I'm always telling women, "You're not supposed to smell like a Summer's Eve," the douche thing and what ... I'm so glad you mentioned that because what's crazy about that is that in the gut where diversity is key and the more diverse and the richness the better, but in the vagina, monoculture is the name of the game and Queen Bee is lactobacillus. And so lactobacillus, we know that vaginas where lactobacillus predominates are not just healthier, but they are way more resilient to STDs. So we know that some women with high levels of lactobacillus can get exposed over and over to HSV, HPV HIV, don't become infected. I still don't recommend that as your weapon against STDs. Please suit up, or whoever you're having sex with, have them suit up. That's not a reliable method.

Dave:

Yeah, that won't work.

Robynne:

But we know that, by contrast, vaginas that have a lot of Gardnerella, Prevotella, other, that what we would call bacterial vaginosis where the vaginal microbiome has been disrupted have much higher levels. So it's not ... Again, exposure to viruses is somewhat inevitable, but infection and illness is not. And this stuff is not just random. We can predict, if you have bacterial vaginosis and you don't have sufficient levels of lactobacillus, we know that you're much more likely to become infected when you get exposed to HPV and potentially to go on from just HPV to develop genital warts, carcinoma, etcetera. We know that some people, no matter how many times they get exposed to HIV are completely immune, and some of that is on a genetic basis and some of it is on a microbial basis.

So this idea that, as a host, first of all that host health matters and that you can become a healthier host is just common sense, basic scientific knowledge that we know and it's true for everything. We know that a healthier person is going to have a better outcome from cancer, a better outcome from pneumonia, a better outcome after a heart attack if you have healthier soil. And there's an article that came out four days ago showing that in children, preexisting illness is the most important marker for outcome. If your child is a sick child and they get COVID, they're more likely to have a bad outcome. They're more likely to have long COVID.

So again, just trying to connect the dots for people because I feel like the dots have been so disconnected by, I think, stakeholders who have a lot to gain by making people feel afraid and powerless.

Dave:

That was awesome. My phone rang and then your microphone fell, so we both did it at the same time. We planned it that way.

Robynne:

Yeah, let me get readjusted here. There we go.

Dave:

All right, you're back?

Robynne:

Yeah, I'm back. It must have been your phone calling my light.

Dave:

I think that's what it was. There's a company called Evvy, E-V-V-Y, that's doing the full vaginal microbiome. And of course, there's Viome that does a test of your gut bacteria that includes some viruses. I don't think it includes all of them, but I was intrigued when my Viome tests showed that I had some plant viruses in my gut, probably from when I was a raw vegan and I was eating tons of raw plants. What's up with plant viruses living in our meat bodies?

Robynne:

A lot of that testing I think is still in its infancy. And so we're still identifying organisms. We're still figuring out what it means, because of course, it's a whole idea of metabolomics, right? It's not just what the organism is that you're growing, but what they're reproducing. And we know that both bacteria and viruses can switch in terms of what they're doing, what types of cells are infecting, etcetera. So I think it's great to be the citizen scientist and to do this testing. I love American Gut Project because they're a non-profit and they have open sourcing for a lot of different researchers and we're figuring this stuff out.

Dave:

They were at my second conference. We just had our ninth ...

Robynne:

Oh wow.

Dave:

... or our eighth annual, but in its 10th year because COVID set the clocks back. But yeah, this was almost 10 years ago when they were first formed, American Gut Project was out there. So there's a lot of interesting research. I just know when I see whatever tomato virus or something in my gut, I'm like, "What the heck?" or actually, it was a red pepper virus.

Robynne:

You can't go wrong with plants. I think it's a good sign.

Dave:

It's a good sign you have a plant virus in your gut?

Robynne:

Yeah, I think it's good. I think it's fine.

Dave:

Why?

Robynne:

I think it's fine. It means you're eating plants. That's probably how you got it.

Dave:

But I've seen associations of having an actual, not just having it there because I promise you I wasn't eating a bell pepper now for years because I'm violently allergic to them. And so there's correlations between having plant viruses and being allergic to those types of plants which are intriguing to me. So you just don't worry if people have a ton of plant viruses?

Robynne:

No, because again, we don't know, and with the microbiome testing, we see all these weird results, but it's like the food sensitivity testing. People get all freaked out and I'm like, "Okay, it says you're allergic to blackberries. Do you eat blackberries?" They're like, "Every day." I'm like, "What happened?" They're like, "Nothing." So again, some people make antibodies to a lot of things. Some of the techniques we're using to identify this stuff are a little squirrely. They haven't been perfected yet. So this stuff is in its infancy. It's growing. We're going to see more, but right now, it's hard to draw a straight line.

Even the incredible breakthroughs in the last few years like the associations with Epstein-Barr virus and MS, we know there was an association with Epstein-Barr virus and rheumatoid arthritis and lupus for a long time, but now we see the association with MS. We still can't definitively say Epstein-Barr virus causes MS. The majority of people in the US are exposed to Epstein-Barr virus. We've been infected. The majority of us don't have MS. So what is it about the person with MS that allows or that creates that different pathway where they develop that. The same for things like ME/CFS, etcetera. So there's still other factors, and yes, some are genetic, but there are other environmental factors too that help potentiate how these diseases form.

Dave:

There's a group of people like me who'll say, "Look at the fungal biome and look at mycotoxins and fungus in the environment in the oral cavity, the interactions of fungus and bacteria, even for streptococcus, they get much worse. They form biofilms in the presence of mold and mycotoxins." But then there's this other thing where when you have something that interferes with immunity, whether it's the most popular virus that it's scary to name because it might take you off of social even now or whether you're talking about Epstein-Barr or HSV or any of these other ones, how do we know fungus, bacteria, virus? How do we sort through all that to know what's causing any long-term disease or any autoimmune disease?

Robynne:

Yeah, to your point, it's not a straight line and I read a lot. It's dizzying sometimes. So yesterday, I get these feeds with particular areas in gastroenterology. And as somebody who treats patients with Crohn's and ulcerative colitis, I get a lot of those and I get the research early. So new study showing that norovirus, infection with norovirus could be a potential cause of Crohn's disease. Well, we've seen just

as many studies showing that fungal overgrowth and infection with candida can cause Crohn's. We've seen studies ... At one point, it was postulated that paratuberculosis could cause Crohn's. It causes something called Johne's disease in cows.

So again, I think we're not looking for the one thing. It's not the one superfood, it's the sum total of what you eat. And the same thing here, it's not the one infectious thing. And you can go, "Aha, I had norovirus and now I have Crohn's." It is, "What is the milieu?" So I think a lot about this concept of terrain and I obviously didn't come up with it, Antoine Bechamp did a few hundred years before me, with this idea of the soil versus a seed. So if you think of Pasteur's germ theory as a seed, Bechamp says, "Well, if the soil is healthy, the seed can pass relatively harmlessly through without causing too much disruption."

So to your question, Dave, which is a really interesting one, what is it that's causing this stuff is if the soil is generally disrupted. And I love the term, I think it's Rob Knight from Human Gut Project, who, I'm not sure if he's the one who coined it, this idea of a pathobiont. So a pathogen bad guy, Ebola pathogen and then symbionts are bacteria that are typically symbiotic with us. They either live harmlessly or sometimes even mutualistically and they provide an advantage to us, to the host. So in a situation, let's say, where you take antibiotics, let's say a woman takes antibiotics, removes a lot of our healthy gut and vaginal bacteria, now she gets a yeast infection, which isn't really an infection because she had the yeast in her body anyway, but now the yeast are overgrowing because there's more room. So that would be a great example of a pathobiont.

Candida isn't a pathogen. Candida is present in all of us, but at high levels when it's overrepresented, it becomes problematic. The same thing if we look at the gut, when we see high levels of things like streptococcus and Klebsiella and different clostridial species, these are all ... Even Prevotella and Gardnerella in bacterial vaginosis, they're normally present in the woman's vagina, in a healthy vagina, but they become overrepresented. So I think that creates even more confusion in terms of trying to sort stuff out because now you're seeing organisms and constantly trying to stop people from treating Klebsiella in the gut. I'm like, "The high levels of Klebsiella are not the problem. It's supposed to be there, but there's more of it because there's not enough F. prausnitzii or bifido or whatever it is that that should be there.

And so I think it's easy to misconstrue when we see overrepresentation of these species that they're pathogens when really there's just more of them because there's more room and it's the missing microbes that is really the problem.

Dave:

What evidence do we have that a weak bacterial microbiome makes you more susceptible to whatever virus is most popular this year?

Robynne:

Oh, we have great evidence for that. One of the hallmark studies, and it was really one of the things that really engaged me and got me so excited and I was like, "Oh, I got to write a book about this because people don't know," so one of the studies was looking at how can you predict the value of the microbiome. And what they found was that high levels of Faecalibacterium prausnitzii, that same one that produces all the short-chain fatty acids and low levels of Enterococcus faecalis, which is a not so good one, when you looked at those two and a couple other species, Roseburia and some others, Enterococcus faecalis, they found that the accuracy of that was 92%, which was more accurate than looking at everything else combined, age, comorbid disease, C-reactive protein, etcetera. And accurate in terms of predicting respiratory failure, ICU ventilation, death.

And so we have really great evidence and those studies have been duplicated. They're in China, from the US, etcetera, saying that the health of the microbiome is actually the most predictive factor. And when you think about it, Dave, it makes sense, right? Because when you look at the comorbidities like having obesity, being diabetic, heart disease, all of those things themselves are correlated with disturbances in the microbiome. So it's not like those are separate conditions. It's all pointing to the same thing. The one thing that is a little bit of an outlier is the data on anxiety, right? We know that stress can induce changes in the microbiome for sure, but stress and anxiety seem to be a separate indicator for poor outcome that doesn't correlate as well as the microbial changes.

Dave:

So in the second week of the pandemic, I filmed a video at an airport and I said, "Guys, for my own safety, could you drop their croissant in the trash because it's messing up your health and that's the only way that I can feel safe is if you do what I say?" Maybe I wasn't that misguided given that there's no dietary fiber and tons of sugar that's bad for your bacteria, right?

Robynne:

Not only were you correct in that and this is a really politically charged one, but I'm going to say it, is that we are only as healthy as our least healthy citizens. Because for example, if you look at a risk factor like having obesity, we know that people who have obesity have a worse outcome for lots of reasons, primarily to do with the mechanics of obesity as well as the fact that adipose tissue itself is immunologically active and leads to some negative consequences, but we also know that in the setting of obesity, there's prolonged viral shedding. Prolonged viral shedding also means more opportunity for contagion, for passing a virus and more opportunity too for the virus to mutate. And so-

Dave:

Oh no, wait.

Robynne:

So if you have a population with a large percentage of people with obesity, you're going to potentially have higher levels of contagiousness and prolonged shedding with opportunities for viral mutation. So you see how somebody else's health if you think about super spreaders. Super spreaders have to do within mucus which is a really fantastic cross between jello and glue that functions to trap viruses, irritants, pollen, smoke, etcetera. And then the cilia move it all up and out. But also in mucin are these proteins that degrade viruses and break them down, some people have better enzymatic capacity in their mucus than others.

And so if you have somebody whose mucus is not that great, let's say it's too thin, the concentration of water or it's too thick, the concentration of water isn't what it should be and their enzymes don't work that well, that means that they're not going to do a good job of inactivating the virus that way. And when they cough or sneeze on you, they're more likely to transmit virus. We know that a huge percentage with this last pandemic of the virus was spread by super spreaders. We know if we look back at things like Ebola, even measles, we know that the contagious risk for you receiving somebody's bodily secretions is very different based on what their body chemistry is.

And speaking of community violations, I did a post a month or so ago where I basically pointed out, I said, "In 0.5% of people with polio, one in 200, the virus crosses the gut lining, gets into the bloodstream, travels to the central nervous system and causes devastating flaccid paralysis. In two out of three people that Ebola encounters, it is not able to make them sick. It's one third of adults and a tiny

percentage of children. And so in 10% of people who encounter HIV will never become infected no matter how many times they're exposed to it because they're immune. So what is it about the host that this is all this ... We're talking about the same virus in each instance, the same viral exposure. So host health matters. It matters greatly and it can determine whether you are that 0.5% with flaccid paralysis or the 199 out of the 200 who basically are asymptomatic. And that post was taken down.

Dave:

Seriously?

Robynne:

Correct. A post ...

Dave:

Oh my god.

Robynne:

... for saying, "Host health matters," and in the introduction of my book, I say like, "It's great that we have vaccines and all these other things because they can be very helpful, but we also have to not forget about the, quite frankly, far more powerful post-defenses in our own body, like a healthy functioning immune system like stomach acid to denature viruses, like mucus to trap and expel it." But apparently that is in violation of community guidelines.

Dave:

Your sentence wasn't complete, "Host health matters for pharmaceutical profits." There, now the full sentence is out and you can see why very basic posts like that or the one that I did in the second week of the pandemic about IL-6, interleukin-6, which is the primary inflammatory signaling molecule that goes crazy, like, "Guys, here's 45 things that lower that," and that had to go down.

Robynne:

Wow.

Dave:

Not because it was in violation of community standards. But the thing that's most disturbing that you've said so far is that a population is only as healthy as its weakest links because have you seen photos of any of the health czars in the west? Those are the unhealthiest people of all. So if they are the bar, we are screwed as a species. Now, if we're screwed as a species, that doesn't mean that we can't be the two-thirds of people who don't get Ebola and die. So if I wanted to choose to be someone who was more resilient than my government and their pharmaceutical owners wanted me to be, what would the steps be to take?

Robynne:

Well, the first thing I'd want you to do is I'd want you to take a good look in your medicine cabinet because a lot of the things that will sabotage your host defenses are actually in the medicine cabinet. So of course, antibiotics are at the top of that list, but acid blockers are right up there with them, the little purple pill and all the other variations, the Prilosec, the Prevacid, Nexium, Protonix that people take.

And these drugs are amongst the most commonly prescribed drugs in the world. They're really good at what they do, which is they completely shut down the proton pump in your stomach.

And of course, that interferes with digestion, but it means then that when you ingest a virus, which is a common way for it to get into the body, in fact, we have more ACE2 receptors in our GI tract than we have in our lungs, so when you swallow a virus, instead of it becoming inactivated by stomach acid, acid unravels the genetic material, the DNA or RNA and renders it inactive. So now that doesn't happen and now the virus is able to infect the intestinal cells, get in that way. So there was a study that came out, this was another one of the studies that made me go, "Okay, people don't know this stuff. I need to write a book."

In July 2020, population-based study, 54,000 patients asking the simple question, "Does being on an acid blocker increase your risk of a viral infection?" of the kind we have been talking about, and the answer was, yes, doubles your risk if you're taking it once a day and a three to fourfold increase if you're taking it twice a day. Now that was not a surprise to me, Dave, because as a gastroenterologist, I've been seeing increasing risk for C. diff, for Campylobacter, for all kinds of enteric, gut-related infections with people on acid blockers for years, but it just wasn't put out to the community at all. There was literally no public health announcement for the millions of people taking proton pump inhibitors mostly unnecessarily. Some studies show 80% of people taking those drugs don't need them. Nothing. Nothing.

Dave:

Okay, let's nerd out for a minute here because I'm not a doctor, but I sometimes talk to them on the internet. So Pepcid is an H2, a histamine receptor blocker, not a PPI.

Robynne:

Correct.

Dave:

And it's shown really good results for long, insert name of virus that shall not be named for god's sake, and even during an active infection, when you're getting lots of mass cell activation that's set up by histamine. So I've seen tons of people, including me after COVID take it for a while in order to allow mass cells to calm down, so we don't get the GERD, the gastric reflux, which can be caused by overactive mass cells. So you get an infection, your immune system is primed, and all of a sudden, you eat things that maybe weren't a problem before, and all of a sudden, you're getting gastric reflux, not because of acid but because of mass cells exploding in your esophagus.

If you're doing that and you're taking an HCL to increase stomach acid, which is what I do, what I've been recommending on my telegram channel where you can still talk about stuff like this, is that going to be a bad thing? Is that a good thing?

Robynne:

Well, remember-

Dave:

Talk to me about Pepcid versus PPIs which are-

Robynne:

Yeah, so Pepcid, not talking about Pepcid. Pepcid does not have this increased risk. We're talking about PPIs specifically. So different class of drugs, completely different mechanism of action, different level of blocking stomach acid. But to get back to your larger questions, so the medicine cabinet is a big one, antibiotics, acid blockers, NSAIDs, steroids, biologics, all of these things need to be really examined and you need to do a careful risk-benefit analysis, number one. Number two, you want to think about not dismantling those host defenses that kick in.

So for example, we talked about mucus. So when you have a viral infection and you have increased mucus production because your body is trying, which comes from the gut by the way, about one and a half liters a day, so your body's increasing the mucus production, so it can trap the virus and expel it, don't take an antihistamine to dry up your mucus membranes or a cough syrup. You want to keep that mucus flowing. Another thing, fever, we know that viruses like polio replicate 250 times faster at normal body temperature compared to when you have a fever. So your fever is your body's way of slowing down viral replication. What do we do? We reach for some Motrin and Tylenol and, "Oh, a fever, we got to bring it down."

So fever has been preserved throughout evolution because it serves a really important purpose and the purpose is both to alert you that there's something going on as well as to try and fight whatever that is. And fever activates our immune system, does a lot of different things. So in the plan, in the book, I really tried to make it very actionable. The plan is about half the book. And I don't just say, "Don't take this medication." I go through each medication. "This is a question you should ask your doctor. These are reasonable substitutions." With the fever, there's a whole section for babies, for young children, for adults. "These are the fevers you need to worry about. Check with your pediatrician. This is a situation where the fever doesn't need to be treated. Here are 15 other ways to make you more comfortable when you have a fever besides taking an antipyretic, a pharmaceutical drug that's going to just completely get rid of that fever."

So the host defenses like stomach acid, like mucus, like a fever, understanding how sleep works to reboot your immune system and how important sleep is. So the data on sleep is just mind-boggling. The data shows that people who are sleep deprived, even the vaccines are less effective when you're sleep deprived, significantly less effective. And ...

Dave:

Wow.

Robynne:

And the big study with sleep was that people who are chronically sleep deprived are about 76% more likely to become infected. And for each additional hour of sleep you get, there's a drop by 12% of risk. But we've known that for ages. We know that from some classic studies done at Carnegie Mellon exposing people to a different kind of coronavirus that causes a cold and then seeing that people who are sleep deprived get sick much more or more likely to get sick. They're more likely to have symptoms for longer. So some of this stuff is not new.

Dave:

Wow. So if we were to just set aside human suffering and freedom and all that kind of stuff and we wanted to make people safer, we would take tired people and obese people and we'd lock them away until they got sleep and were not obese, right?

Robynne:

No, no, no. We wouldn't lock anybody away, but we would make the things that make it easier for people to lose weight like more leisure and access to green spaces and safe places to exercise and people who don't have to work three jobs and-

Dave:

Oh, like the stuff governments are supposed to do. I remember that.

Robynne:

Exactly.

Dave:

Yeah, I'd almost forgotten. Oh, thank you for reminding me of why we put them in place. Oh, okay. Got it. Sorry, I thought I was in some kind of trance there for a minute, but okay, I've returned back to reality. And I want to remind people the name of your book because you mentioned it earlier is called The Antiviral Gut.

Robynne:

The Antiviral Gut: Tackling Pathogens from the Inside Out.

Dave:

And this is really cool, because look, screw all the alarmism over the last couple years, if you have kids in school, every single year at the beginning of school, they come home and they're blowing snot all over the windows and there is no way you're not going to get exposed to that. Some parents get sick every year and others don't. Teachers almost never get sick when they're experienced teachers, but for the first year or two, they do because they haven't got their immune system drained. New emergency room doctors, as you all know, they get sick all the time, and after a year, they're somehow invulnerable. What's going on with those teachers and doctors? Is that a GI thing or is it something else?

Robynne:

Yeah, well, they are what we call immune. So what that means is you get ... When you think about how the immune system works, you have the innate immune system and the adaptive. And the innate works quickly, but it's nonspecific. So you get a cut and all the white blood cells rush in to fight whatever's there, but not specifically what's there. The acquired immune system is basically you, and for some things, you're immune for life, right? So you get measles, your body then recognizes it because it's actually keeping a record of all these things you're exposed to. And then when you get exposed to it again, it recognizes it. So for something-

Dave:

You mean, the measles vaccine, right? Because it's not legal to get measles anymore.

Robynne:

No, I mean measles, measles.

Dave:

I didn't think it was allowed to get measles unless you got the vaccine and it gave you measles.

Robynne:

Well, for those of us who are old enough and now grew up in different places, I grew up in Jamaica where everybody had measles and mumps and chickenpox and-

Dave:

That's so weird. So but the only way you can get it now is you get the injection to stop it and then that gives it to you and then you're allowed to get it.

Robynne:

Correct.

Dave:

But otherwise, you can't get it.

Robynne:

We get a little bit of it, exactly. So that's what the measles vaccine is doing, it's exposing you to a little bit of it. And then-

Dave:

Man, I'm just putting you on the spot because it's fun and you're a medical doctor and you're handling it so well. So thank you.

Robynne:

Thank you. Yeah, amazing, Dave, I had measles and mumps and chickenpox and I am alive and please don't come after me and say, "How many people all this stuff kills?" because I am not in any way suggesting that you should not get your children vaccinated, I am just saying that that is a relatively new phenomena and that, when I grew up, I won't have these illnesses. So back to this not politically charged topic at all, thank you very much, Dave, yes, so then your immune system goes, "Aha," what it ceases again, "I know what that is," and in some cases, you're completely immune, you don't get again, and other situations, you might get less sick.

So for example, there was a group of people in Boston who had been exposed to different coronaviruses, obviously not SARS-CoV 2. And when they did get SARS-CoV 2, they were much less sick. Because even though it was a different type of coronavirus, there was still some memory sufficient for them to have some immunity. And of course, having COVID is the best immunity, right? That makes you much more resistant.

Dave:

You know what was some of the craziest stuff that came out? You didn't hear a lot of people talking about it, but you would predict that in meat packing plants, we have people [inaudible 00:57:00] to a room and they're malnourished and they're cold all the time. This is the worst thing you could do to prepare someone to be resilient against any kind of infection. And in prisons, where the food is really, really unacceptable and the quality of life is designed to wear people down, these populations got the infection, but almost none of them had serious symptoms. It's exceptionally rare. And the reason for that was probably because they'd already been exposed to enough other similar things that they just

had immunity. I think that's what doctors and teachers get as well. They're just constantly exposed to the immune system's like, "I'm a Swiss army knife. I got this."

The rest of us though who've maybe been soaking ourselves in immune-destroying hand sanitizer to stop something that's airborne and filtering everything that we breathe for a couple years, are we at a disadvantage now?

Robynne:

Well, let me circle back to the point about the other group too because I think you're making an important point there that I just want to emphasize for people. Yes, there's an issue of previous exposure, but there's also ... We saw a lot of the same phenomena amongst refugee populations in different parts of Sub-Saharan Africa, etcetera. People who have less access to pharmaceuticals, who are less likely to be on steroids and acid blockers and antibiotics and soaking their bodies in antiseptic, antibacterial agents. So people who are less super sanitized in general. And we saw the same thing when this whole concept of the hygiene hypothesis in the 1950s when David Strong, who was an epidemiologist at the London School of Tropical Medicine and Hygiene was tasked with finding out why they were seeing these skyrocketing rates of autoimmune diseases in children.

He embarked on this 20-year study in post-industrial London and then he found that kids from large families who were getting sneezed on and infected by their siblings and cousins, etcetera, were immune to developing these autoimmune diseases later in life. And kids from small families, especially the rich ones who were bathing all the time had much higher rates of these diseases. So the idea that it's good to be dirty, we've known that from the 1950s, but we somehow forgot. And when I say dirty, do I mean not bathing at all? I don't mean not bathing at all, but I mean less super sanitized, less cleansing the body of these actually really essential microbes and cleansing the food. Eating food that's highly processed, that's very pesticide, that's grown in factories instead of in microbially rich soil, all of that.

Dave:

There's also a really interesting correlation between the bacteria in your environment, the bacteria on your skin, the bacteria in your eyes, your sinuses, your mouth and what's in your gut. And they're linked. I even cited a few studies in my book Game Changers, one of the 46 or so rules or 42, whatever it was that was in the book, it was that you needed to spend some time outside in different environments because there are studies showing if you walk in a forest, you will change your gut bacteria based on what you breathe in the forest. And the same thing goes for the desert and the ocean and all that. And it seems like that's just gone missing in the last couple years.

Robynne:

Well, you were ahead of your time, Dave, because the open air factor and it's something I talk about in the book, you're right, it's something old that's new again. But the open air factor, which is described as a germicidal constituent in open air that is toxic to pathogens, to bacteria and viruses, we know was responsible a hundred years ago with a Spanish flu for a decrease in mortality. The irony there is that often the offices were put inside the hospital to recover and the enlisted men had to sleep on cots outside. While being inside the hospital in this study was associated with a 40% mortality and being outside in a 13% mortality. So again ...

Dave:

Wow.

Robynne:

... this open air factor, the shinrin-yoku, the Japanese term for forest bathing, not only does it decrease blood pressure, increase feelings of wellbeing, decrease risk for heart disease, improve wound healing, it also makes you more resilient to viruses. I sometimes jokingly, not so jokingly say that my whole medical thing is dirt, sweat, veg, right? Get outside in nature, get sweaty and eat some vegetables, but actually, if you added sleep to that, it's pretty good. It's almost covering all of it, right? Fewer drugs, more nature, open air, all of it, it is so real and it is so potent and it is scientifically proven, but it is not part of our public health messaging simply because it is not making anybody gazillions of dollars.

Dave:

Would it be cool if you could just write a prescription for that and then maybe the patient's insurer would just have to pay you 250 bucks, and of that, you could give 200 to the pharmaceutical companies and they wouldn't have to make anything to make obscene profit?

Robynne:

If you could pay them off.

Dave:

At least, they'd stop doing harm, right? And then you'd make 50 bucks as a doctor. Like everyone would win in that. So I think we need to increase doctor's power to recommend things and get paid for it by insurance companies. Does that make sense?

Robynne:

You speak about doctor's powers, but we've seen some really scary stuff. I call it Medical McCarthyism.

Dave:

It's crazy.

Robynne:

And the people who quite frankly should be the most emboldened to speak or the people, the physicians taking care of patients, we're the ones where you see one word that doesn't sound right and next thing you know they're employing trolls to go after you and your medical license. It is crazy town with, when you are not allowed to question science, that's when progress stops when it comes to a grinding halt.

Dave:

And that's when it's not science. Science by definition questions itself. And when you stop that because you're a politician, well, we talked about douches earlier, that's what you are at best, and at worst, you're a tyrant. And so the good news is the US has a long history of overthrowing tyrants. So let's hope that those listening understand that that's what will happen if they continue on this path. The doctors will rise up and refuse to treat politicians and most of you politicians will die within three minutes, "I'm not [inaudible 01:03:26] because you're so unhealthy." So there's that. It is okay to refuse care to politicians. It's within the Hippocratic Oath because it says, "Do no harm." And if you're helping someone who's a repressor, you are doing harm. So there you go, I just freed a lot of doctors to say, "Screw off to the people trying to take their licenses."

Now, to return back to something we're still not supposed to talk about, in your book, The Antiviral Gut, you talk about patients who are recovering from that, which shall not be named but ends in 19. Now, how'd the plan from the book work for people who were recovering?

Robynne:

Yeah, the thing about, and I'll just say it, long COVID, is that we both know a lot and we don't know a lot. We know a lot because we have a lot of experience with other post-viral syndromes. So we have chronic hepatitis C and B and we have mono, and we have ME/CFS which is really a post-viral syndrome and we have postinfectious-

Dave:

Or post-fungal. [inaudible 01:04:28]

Robynne:

Yes, postinfectious, let's say.

Dave:

There you go. Postinfectious, yup.

Robynne:

Postinfectious. And with many different possible infections, human herpesvirus 6 as well as others. We have postinfectious irritable bowel syndrome. So this idea of an infection, bacterial, viral or fungal, creating some disruption and then continuing on with additional symptoms, new symptoms or perhaps chronic symptoms that they had with the acute situation is not new. We've known about that. And a lot of these other postinfectious syndromes, we see that the etiology is multifactorial, right? There's disruption to the microbiome which is a big one.

Dave:

Right.

Robynne:

Sometimes there is an ongoing immune response, which is, of course, also related to what's going on in the microbiome. So the infection is over, but the immune response is still going. Sometimes the virus itself is still active. And we see with long COVID, researchers have identified a couple key factors. One of them seems to be reactivation of EBV in a lot of patients. There's autoimmunity issue. We see a positive ANA, an antinuclear antibody in a lot of these patients, even though they don't actually have clear autoimmune disease, either a history of it or that's not what they're manifesting, but there's some kind of autoimmunity which means the body is reacting to itself.

And we see that there are pathways of androgenesis that are disrupted. So again, it's not a straight line. There are a lot of different things that can be going on, but certainly paying attention to your gut microbiome, trying to improve the health, the diversity, the richness of your microbiome. The only bad thing that can happen from that is you get healthier, right? So even if it doesn't solve every single one of your symptoms, in addition to stool nirvana, you will have a decreased risk for heart disease and autoimmune disease and diabetes and obesity and all these other things. And a lot of the pathways are very helpful.

And again, a lot of these things are pretty basic. It is in addition to the diet and I do outline in a lot of detail what sorts of things you should be eating and some things you might want to avoid, but in addition to that, it's also really taking a careful look at things like the sleep quality, not just the amount, but the quality, "How are you managing stress? How can you activate your parasympathetic nervous system?" Even hydration. Just like in my GI practice, I think, I don't know, 20-25% of the problems I see can be solved if I could just water somebody with a hose and just hydrate them. Their bloating, their constipation, a lot of this stuff would get better. A lot of the symptoms, the chronic symptoms require an increased level of hydration, right?

So somebody is going along, let me take a sip in honor of hydration, somebody's going along and they're like, "Well, I've always drank 60 ounces of water," but now they have a headache and their joints feel achy and they have other symptoms and they actually need 120 ounces of water, but nobody's telling them that. And so there are a lot of things where just paying attention to the basics are still helpful. And then of course, there's some fancier things that can be done too.

Dave:

It seems to me that most cases of long COVID involve fixing the gut, involve calming the mass cells, the inflammation system in the body and fixing mitochondria. So turn up energy, turn up hydration, fix the gut, which turns down inflammation and then just supercharges mitochondria. It's the same thing you do for toxic mold people. It's the same thing you do for people who've had Lyme disease, most of whom had toxic mold and think they have Lyme disease and all the-

Robynne:

And most of them have gotten a ton of antibiotics on top of that that have created more damage. Yeah.

Dave:

You nailed it. So I've had lots of friends call, "What should I do?" And then two weeks later or a week later, they're like, "Oh my god, I feel so much better." I'm like, "Yeah, you fixed your mitochondria, but your gut's still wrecked because you took whatever antibiotics you took." And frankly, Zithromax helped a lot of people, but afterwards, you better have your prebiotics, you better have your probiotics. And now I want to go into lightning round with you. So give me your top five probiotics.

Robynne:

I can only give you one, Visbiome and then I can say, get me to the farmer's market for some really great homemade fermented products. Yeah.

Dave:

So fermented stuff and what was the first one?

Robynne:

Yeah, Visbiome. V-I-S-B-I-O-M-E.

Dave:

Okay, I don't even know that one.

Robynne:

Yeah, it's not big marketing budget, but incredible data, over a hundred studies looking at some particular indications like pouchitis which is inflammation in the remaining gut after the colon has been removed, irritable bowel syndrome, etcetera. And the prescription strength, which is what I use, 400-billion colony forming units per packet. So it's classified by the FDA as a medical food, a medicinal food.

Dave:

Now it, is it okay that people shouldn't be able to just buy the high-strength stuff without a permission slip from you?

Robynne:

Well, here's the thing, there are situations where probiotics can be problematic. Somebody who's immunocompromised, there can be contamination. Fortunately, I've not experienced that with that particular brand. So I'm of a mixed mind of that. First of all, sorry, the prescription strength is 900 billion. I misspoke and the regular packet is 450 billion and that's over-the-counter. So you can just take two regular packets when you're there, right?

Dave:

Okay.

Robynne:

With the 900 billion, so it's not as restrictive as it seems.

Dave:

Okay, good deal. I hear you on that one. I always wonder, because as biohackers, we work with our doctors and our other care providers as consultants, but ultimately, we're responsible for our behavior and for our choices. And we get advice from all sorts of people. And so I'm always a little uncomfortable when, well, yes, no one else can recommend this peptide because it's controlled by someone who has a financial interest in it. And I'm like, "That seems like-"

Robynne:

And I'll say I have zero financial interest with anyone and definitely not Visbiome, but I do think because-

Dave:

Definitely. I'm not accusing you of that at all.

Robynne:

Yeah, no, no.

Dave:

[inaudible 01:11:04] across that way. But just the idea that if you wanted to get a diamond, the world's supply of diamonds is controlled by the De Beers family, which is why they're so damned expensive, even though they're common. And I'm thinking, "What else is like that in the world, right?"

Robynne:

That's interesting. Yeah, that's a very interest ... And you see drugs that when they first come out are like, "Oh yeah, this is a big gun. You can't get it." And then it becomes over-the-counter and you realize that it wasn't really for financial reasons, not because it was a dangerous big gun drug.

Dave:

Cool. So I'll see if I can reach out to those. I'm going to try some of that probiotic and see if I notice any difference. I've tried quite a few and have some very well-studied ones I've mentioned on the show before. And the bottom line I've come across, and I want you to tell me if I'm right or wrong on this, is that the prebiotic substrate is probably more important than the probiotic because if you take them ...

Robynne:

Absolutely.

Dave:

... and you can't feed them, nothing happens. So you're in alignment with that?

Robynne:

Yeah, absolutely. And prebiotics, you just get from food. So high inulin foods, leaks, garlic, onions, oats are great, lots of prebiotic foods, which I'm a huge fan of.

Dave:

Okay, beautiful. Is there anything else that we need to know about having super healthy guts that we would get from your new book, The Antiviral Gut?

Robynne:

Yeah, I would love to also mention the gut lining. Because when you think about it, Dave, when stuff is in your gut, it's not inside your body. It's in this 30-foot hollow tube that runs from your mouth to your anus. And that gut lining, that razor-thin, one-cell thick lining is the only thing protecting the inside of your body, your organs, your bloodstream, etcetera, your immune system from all the morass of toxins, bacteria, viruses, whatever else, undigested food particles floating through your GI tract. And as you know, it's a highly selective membrane. It allows the right things to come through ideally and it allows the cellular debris from the cells to go out

But when it's damaged, so when you take ibuprofen and you get an ulcer, all that is a big hole in your GI tract, but there's smaller versions of that. And so what can cause that? Infections, yeast infections can do that, parasitic infections. But by far, the biggest injury we see is from the medicine cabinet. Again, it's nonsteroidal anti-inflammatory drugs and overuse of antibiotics. And so those things damage the gut lining, make it more permeable and allow all kinds of things to penetrate that shouldn't including viruses. They make it easier for viruses to get in if you have increased intestinal permeability. And there's a great study from Korea that shows that MIS-C, multisystem inflammatory syndrome in children and in adults is associated with increased intestinal permeability. They see high levels of zonulin, which is a marker for that and they're able to isolate virus in the stool in those patients and in the bloodstream a lot of the time.

And so just again, you're allowing entry into your body through this membrane that's supposed to be one of your most critical defenses. And so there's a whole section on how to prevent that and how to maintain your intestinal permeability because it's your gut shield literally.

Dave:

I like that and it is that important. My gut was so incredibly bad for much of my life because of the silver growth, because of toxic mold exposure, because of years of taking antibiotics for chronic sinusitis and strep throat and probably because of the birth procedures in the 1970s. It all goes back and back and back. And I don't want anyone to have a gut that wrecked. And right now, I know that my gut will go back to being that wrecked if I eat the standard American diet. You give me a bunch of ultra-processed, glyphosates, [inaudible 01:15:13], industrial, whatever, crispy plant pretend stuff, it shreds my gut and my health goes away and I become tired, I become unfocused, I have love handles. It all comes back.

And this is one of those reasons that I teach everyone, "You got to know your kryptonite," but my gut is relatively healthy now because I feed it the right stuff. And every person has a different set of right things that work. And I think your book has a new focus, "Well, what if you didn't want to be susceptible to any virus? What would you do for your diet and your gut?" And my addition to that would be, "Yes, read The Antiviral Gut and then see which of those things are going to work for you. And there may be one thing in there were for you because of your allergies or because of your genetics or whatever." Like, "Man, I try that one, it doesn't work," and then just don't do that one for a while and maybe it will work later.

And for instance, me, fermented foods, because I have a history of mold, I also, that means I'm sensitive to histamine. Some fermented foods are very high in histamine. Like fermented-

Robynne:

Yeah, absolutely. No, that's such a good point. Even within my clinical practice, I see patients who just don't tolerate fermented foods. They're really not helpful for them. I have patients who don't do any grains because they set off their inflammation and I have patients who do a ton of grains. So when you give the range of what can be helpful, it doesn't have to be every single thing on there. I divide it up into this sort of red light, yellow light, green light categories and I absolutely encourage your approach that you're describing which is, "See what works for you. See what you can expand, what you can contract and just keep pushing and testing."

Dave:

Beautiful. Well, Robynne, my sincere thanks for being a hardcore gastroenterologist who decided to take a functional bent and talk about this side of things because it takes a certain amount of courage, especially over the last two years to stick to your guns and say, "Hey, this stuff matters." So I appreciate you doing that and saying it like it is versus like you're being told to say. Keep up the good work.

Robynne:

Thanks so much. Thanks for having me.

Dave:

Guys, the book is called The Antiviral Gut and you can find all the relevant links at theantiviralgut.com.