Gut Guardians of the Microbiome
Guest: Dr. Grace Liu

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Dr. Davidson: Hello, this is Dr. Jay Davidson from drjaydavidson.com. I'm excited to welcome you to this very special interview on The Detox Project. Today, my guest is Dr. Grace Liu, and we're going to talk about the gut guardians of the microbiome. But before we do, a little bit about Dr. Grace.

Dr. Grace Liu, Pharm. D. is a trained functional medicine practitioner and clinical pharmacist with a doctor in practice for 19 plus years and specializes in complex disease management.

Dr. Liu consults and helps clients gain optimal performance through rebuilding the microbiome after damage from modern living. She uses nutrigenomic tools and other advanced functional lab testing.

Currently, she's trained some functional medicine leaders to approach gut protocols with her expertise. Clients include paleo movement leaders and a UFC MMA fighter in the top 10. She has been invited to speak at Ancestral Health Symposium, Paleo f(x) for two years in a row, interviewed for a documentary *Microbirth* producers and *Women's Health U.K.* magazine on the skin-gut microbiome.

Recently, she shared the stage with Dr. David Perlmutter, the author of *Grain Brain*, on the expert microbiome panel at Paleo f(x) '16 in Austin, Texas. She's

been interviewed for the Keto Summit, Robb Wolf podcast, Sigma Nutrition, Endurance Planet, and Bulletproof Radio with Dave Asprey.

She's currently finishing a book on the topic *The Amazing Gut: The Magic and Madness of the Microbiome*, which is scheduled to be released very soon, October 2016.

Dr. Grace, welcome to The Detox Project.

Dr. Liu: Thank you so much, Dr. Jay. It's such a pleasure to be here.

Dr. Davidson: Well, I'm so excited to be interviewing you and talking to you about the gut. Obviously, that is your forte. You're essentially the founder of The Gut Institute. That's what you're known for. And I want to dive into the gut guardians. I just love that title. Maybe you can start off just by defining, what do you define as a gut guardian?

Dr. Liu: Well, it's so amazing with all the new 16S RNA sequencing clinical trials now, that's a type of way of characterizing what's in our gut because, before, it was just a dark box. We didn't know what was in there.

Now, we can illuminate that. We know so much more. And what studies show is that there is a consortium that makes up a core human microbiome. It's like a team. Let's say your kids or you play on a soccer team, there's a forward. There's a goalie. There is a wing. There are teams, and they all have distinct roles.

And we know that the human microbiota has a distinct core that keeps us healthy. And we know this because there are a lot of disease stage trials and then they always compare to healthy controls.

And over and over again, through hundreds and even thousands of clinical trials now, the human core microbiota keeps showing up. They consist of about 66 to 88 different strains and genera whereas sick people will be lacking a lot of these. And they can make us more susceptible to diseases, infections, even Lyme disease. You're the expert on Lyme disease and the Lyme Summit. Missing these strains can make us more susceptible to *Giardia* and all different conditions, autoimmunity, and even cancer.

Dr. Davidson: Wow. So there's a core, you said 66 to 88 strains then?

Dr. Liu: Yeah. These are the ones that keep coming up over and over again. And I have seven ancestral strains that I talk about a lot. I talk on my website a lot about them, and we can use amazing functional medicine tests or even

an inexpensive direct-to-consumer kit known as the uBiome where we can get some fidelity. With moderate fidelity, we can see what's going on.

The uBiome is not super high def. It's actually sort of low to moderate def but we can illuminate the strains and genera and see if some of those are there, or if they're actually missing. And this can correspond to health often from what I've seen.

Dr. Davidson: Awesome. So looking at the microbiome in the amount of strains of bacteria—and of course, there's the human microbiome project in identifying bugs. Do you have any idea what the number is actually up to as far as the different types of bugs that could be like in our digestive tract?

Dr. Liu: The number has been even estimated 5,000 to 10,000 possible strains and genera in the human gut. There's a consistent about 300 that seemed to be showing up pretty often in the Western world.

But when you look at Burkina Faso or the Maasai, hunter-gathers in rural areas or rainforest that are away from Western civilization and antibiotics from Western civilization, their core tends to be quite a bit higher, even 50% more. So they tend to have 400 to 500 different diverse ones.

For their core, it's on the higher end. But there are no consistent studies. There's only a few handful of those studies. Whereas Western world studies, there are thousands more now because that's where some of the research is centered.

Dr. Davidson: So speaking about the fact there's maybe not a lot of research yet in this area, do you feel like the higher the core amount of strains that somebody has, the healthier somebody is? Or is it just kind of dependent on the Maasai tribes and these other tribes that they just have a different makeup than we do in the Western world?

Dr. Liu: I think it's actually both. It's interesting you bring that up. It's probably a bit of both, I think. Because what I see is that, sometimes someone has a lot of diversity.

So there are different ways to categorize diversity. There are different indexes. One is called Shannon index. And there's alpha and beta diversity. And what I see is because some people come to me, they've already had Lyme treatment or they've had multiple antibiotics through their life, because the average in the U.S. is about 18 courses by the age of 18.

Dr. Davidson: Wow.

Dr. Liu: Yeah. And for myself, my father's a surgeon. And so actually, with sniffle and fever, he did the best for us. We all got a lot of antibiotics. But maybe with the flipside, each of my siblings and I, we've had an autoimmune condition. Whereas my aunts and uncles, my parents, my grandparents, they're all super healthy, lived to 90 or 100.

But what I see is that people come to me, they've had sometimes chemo or a year or two of tetracycline for acne, a lot of courses of antibiotics for strep or different conditions. And when I look at their gut, sometimes there is a lot of diversity, Dr. Jay. But they actually have a lot of diversity among pathogenic gut flora.

Dr. Davidson: Okay.

Dr. Liu: So we're, yeah, talking about *Clostridium* or *Proteobacteria*. These are just names. For the audience, they don't have to get too worried about it. But these are just like common, opportunistic—they're not necessarily bad. But when they're at a high number, they tend to exert sort of negative forces on the gut, kind of like team.

I look at it as a team. You have a couple peacemakers on a team, a soccer team. And then you might have a couple kind of hooligan, kind of like a little rougher players sometimes. And if there's no balance, it'll soon become quickly chaotic. And no game is going to go too well.

So that's like our gut. Sometimes, that balance can be off. If someone has an off day or they didn't sleep well, there's more cortisol and adrenaline. Then, instead of diversity of good, beneficial flora, like the name of our iTunes podcast, *The Gut Guardians*, and you love that term. The gut guardian diversity may go down temporarily.

And then what happens is adrenaline and cortisol fuel some of the hooligans because they have something known as virulence islands. And they get turned on, activated, by adrenaline and cortisol. Specifically, there are even receptors in their bodies, their little microscopic bodies. And the switch just flips. And they're like "Party Time!" when these are activated.

Dr. Davidson: Yeah. I totally understand that analogy. That definitely makes sense. So talking about—this is The Detox Project. Obviously, the abundance of toxins in our environment, the things we're exposed to whether it's like xenoestrogens or heavy metals such as arsenic or other ones. I mean talking about getting into the gut guardian area, what have you seen as far as like

research coming out, as far as bacteria affecting these toxins and maybe protecting us from it or its role?

Dr. Liu: I wish there were more studies. But, fortunately, there are a couple that have come out in the last couple of years because the technology can elucidate all that now. So there was a really interesting study where pregnant women and kids were evaluated for their gut microbiota. And they were looking at the effects of pesticides.

And the fact was that pesticides actually killed a lot of the good flora in their microbiome compared to healthy controls. There was associated much less of good flora like *Lactobacilli* and *Bifidobacteria*. And instead, there were much higher strains of toxic flora like *Bacillus, Clostridium, E. coli, Pseudomonas*. So for pesticides, there's like a big link.

As we know, when farms are sprayed, the diversity of the soil on the farmland tremendously goes down. And they found that the beneficial—they're not as symbianced. They lose symbiotically in the soil. Their populations go dramatically down. And the crop actually is less robust. They can be more susceptible to diseases. And then they have to spray more pesticides. There's this negative vicious cycle.

But even for heavy metals, as you mentioned, one strain, *Lactobacillus rhamnosus*, the specific strain they were looking at was R37. It was shown to actually prevent bioaccumulation of arsenic and mercury in human subjects.

Dr. Davidson: Wow.

Dr. Liu: Yeah. So these studies are starting to really come out. Another one that we—*Lactobacillus plantarum*, which we find in all of our vegetables that are above ground, make ferments. And actually below ground too, like daikon and fermented roots and carrots.

But sauerkraut, which is made out of cabbage and other fermented foods that grow above ground have a lot of *Lactobacillus plantarum*. And one strain, L67, in an in vitro study, so in a Petri dish, it protected. There was less inflammation from cadmium. So different strains have been now shown to have different benefits for protecting the host or in in vitro studies. And this is pretty incredible.

Dr. Davidson: Wow.

Dr. Liu: Yeah. Some of our ancient knowledge, actually shown in science, that they're protective for humans and mammals that have access to these

bacteria. And there's probably a reason. It's to keep us healthier. And that's why we're here because our ancestors somehow survived. They had these core strains in their gut and contributed to not only help us to thrive but for great longevity and having strong reproduction and fertility.

Dr. Davidson: What do you think the reasoning behind the bugs protecting us from heavy metals? Does it almost neutralize them? Does it prevent kind of absorption in the body or maybe both or not sure? How does the bug really have that effect? Because I think that's phenomenal that a certain bacteria—

Dr. Liu: Yeah.

Dr. Davidson: Can literally protect us from something so toxic such as a heavy metal.

Dr. Liu: Well, the way I think of our gut microbiome is that they're kind of like apps. You bought your Apple—what kind of computer do you have, Dr. Jay?

Dr. Davidson: Oh, I got a MacBook.

Dr. Liu: Okay. Yeah. So do I. I love my Mac. So it has a hard drive. But if you want it to do anything special, you buy an appear, or you load up an app on it. Or even add an extra hard drive. Now, you've got more memory. You've got extra—with things.

So we have 23 chromosomes as a human. But our bacteria can have millions more DNA, depending on how big someone's microbiome is and how conditioned they are, let's say. Because bacteria, they're amazing. They have little orgies all the time in our gut and they share their DNA.

So they get even more DNA when everything is either going bad or good. They collect more of these plasmids, they call it, but extra DNA. They're actually extra apps. Like, I focus a lot on oxalates because people are always really high on yeast and Candida. Because after antibiotics come in, what overgrows? Candida and yeast.

Dr. Davidson: Yep.

Dr. Grace Liu: Because nothing else is around anymore. All the good bacteria are gone. So then the other organisms in the gut—the yeast overgrows. So that's the main focus of some my clinical reviews.

So yeast makes a lot of oxalates. And these are always high on urine organic testing when I look at it. Well, it's shown that mercury and some of the heavy

metal constructs with oxalates become really super insoluble. And this is not good for microbe or a human host or an animal host.

But if you have a magnesium oxalate construct, a crystal, they don't really crystalize. They're a lot more soluble, and we get rid of these. That's why a lot of people do well talking calcium and magnesium with meals because this solubilizes oxalates from yeast overgrowth.

And they actually feel better. They don't feel so icky. Sometimes, their skin clears up. Sometimes, a lot of things clear up because these oxalates go all over our mucosal syndrome and our mucosal linings and cause all kinds of syndromes of disease if they accumulate. Not just kidney stones can accumulate but many other things. People get irritated.

But heavy metals, when they make these constructs, are almost insoluble. So it's really toxic for an organism. I believe some of the microbes, because they've evolved longer than we have for billions of years before humans came along, I think they've figured out how to kind of keep themselves safe having metal transporters to pump cadmium, arsenic, or mercury out and keep themselves healthy, heavy metal free.

And then it benefits them if they're living in a host, if the host lives longer without all these insoluble crystals in their body. So I think they've just evolved these special things because it helps not only them but the house where they're living, which is the host.

Dr. Davidson: That's awesome. It's almost like as if then these certain types bacteria or bugs or probiotics, if you will, or fermented foods, those certain strains—

Dr. Liu: Right.

Dr. Davidson: Consuming those maybe with foods that might have heavy metals in them, whether it's a fish or just something, because, obviously, heavy metals are synonymous with the environment, that those bugs can basically protect us from absorbing the heavy metals that we might be otherwise consuming in a meal.

Dr. Liu: Yeah. Precisely.Exactly.

Dr. Davidson: That is so cool. So take your bug formulas when you're eating to minimize heavy metal absorption.

Dr. Liu: Yeah. Exactly. Well, I don't sell the exact strain. But I use *Lactobacillus rhamnosus* all the time. It's just a game changer. I actually had to formulate my own probiotic because I couldn't find potency enough on the commercial market. I was using all different brands in functional medicine. And I just could not see a lot of results. And even myself, I tried taking handfuls and didn't see a lot of changes even though I was spending hundreds of dollars. That's what happens. A lot of people are spending thousands, hundreds of dollars on probiotics. So we actually formulated our own.

A company custom makes it for us right now. And it has one of the highest strengths of *Lactobacillus rhamnosus* on the commercial market. We call it Bifido Maximus or Ultra Bifido Maximus, which is short for UBM.

And it's just a total game changer. I feel people do kind of detox on it. They seem to look better. Their skin clears up. They tell me bloating goes down in only 10 to 14 days. Some people even lose 5 or 7 pounds. And I think it does work for heavy metals.

I have a really good friend. She has a significant amount of iron overload. And she started taking our probiotic. She had developed osteonecrosis. It's apparently a common thing with iron overload or any kind where there are a lot of heavy metals sometimes. The rust kind of accumulates and can cause damage on the bone.

So she had to use a cane. And this is really sad for her because she used to run. And now, suddenly, she was using a cane because of the iron overload even though she was doing phlebotomy. Well, she took our probiotic. And within a month, she threw her cane away. She said all her arthritis had improved. One joint totally went down in swelling. And then she could move around almost pain free again.

Dr. Davidson: Wow.

Dr. Liu: Yeah. Just with our probiotic.

Dr. Davidson: It makes so much sense though, because iron levels have such an intricate relationship with autoimmune issues in the body. Autoimmune has such a big connection with the gut. So it's like everything's connected.

Dr. Liu: Exactly. Everything is connected. Yeah.

Dr. Davidson: So to put you on the spot, I guess, for other toxins that are exposed to—of course, there are the glyphosate Round Up and all these really bad things. There are aflatoxins. There are microtoxins; gliadins; gluten,

which I would say is definitely a huge buzzword in the last couple of years, especially in the functional medicine world; casein. What has basically like research shown lately as far as the gut guardians for toxins like that in protecting us?

Dr. Liu: So the gut guardians. So I'm going to throw a couple of long names out. But *Bifidobacterium longum*, which every baby has, is supposed to come from mom. If the mom's healthy and has it, she'll pass it to the baby. And *Lactobacillus rhamnosus* and *Lactobacillus plantarum* are a couple of the core gut guardians. And in clinical studies, mostly they're in vitro. They put in the matrix like whether it's aflatoxin or casein or dairy. When they put it in a Petri dish, these strains break it down.

Dr. Davidson: So it was *Bifidobacterium longum*.

Dr. Liu: *Longum*. The *Bifidobacterium longum*, which stands for longevity, that's where they found these strains. They were really particularly concentrated and rich in people with long lives and centenarians; and *Lactobacillus rhamnosus* and *Lactobacillus plantarum.*

Dr. Davidson: So those three. So in other words, those basically neutralize these compounds in the body.

Dr. Liu: Yeah. And there's actually a whole host of many other strains that can do that as well. Specifically, soil-based organisms can do it. And maybe, it's because of the soil, everything is kind of degrading. It becomes a compost heap.

And these bacteria working alongside wild yeast, they co-op together and start breaking all the organic material down into constituent parts to nourish the earth. So maybe they've learned how to do all that. But when we have them in our body, we can have huge health. And we don't get bothered by some of these things that come into our diet.

Dr. Davidson: That's so cool. So a question I'm just thinking about right now. If these neutralized gliadins, gluten, casein—if you're eating food that you're not sure—maybe you're really very sensitive to gluten or very sensitive to casein and react to it and a little bit sets you over. If you're eating food that you think, "Okay, maybe there's a possibility of cross-contamination," and you decided to eat it. Could you take supplements at the same time with those strains and possibly for…

Dr. Liu: I do that. That's on my cheat days, yeah.

Dr. Davidson: Okay.

Dr. Liu: Very minimal bloating, I know. And then if I setback, like a couple months ago, I ate some raw meat. And oh, it was starting all over again. It took two to three weeks just to rebuild stuff and get that resilience again.

Earlier, I was kind of bulletproof. I was eating all kinds of junk that I normally don't. My family and I, we're pretty much gluten free.

Dr. Davidson: Okay.

Dr. Liu: But we're doing some extra foods and going out. And I was almost totally bullet free, like semi-flat tummy and good performance workout. But then I had that setback. And it's like, "Oh, starting all over again."

And my part of my toolbox, I use the Ultra Bifido Maximus probiotic. But I also use a whole bunch of different soil probiotics. One, my favorite, is Prescript Assist. And many of the strains in there, they're soil based. They're not exactly human strains. But they come into contact with us, and they transiently always live in us for a while and then go out.

And most are spore based. So they kind of hang around a little longer than normal other natural native flora. But that really helps, for me, with gluten and dairy breaking down. And I hear that from a lot of friends and clients and customers on the store.

Dr. Davidson: That's great to hear. So my next thought then is if these bacteria help with those things instead of necessarily taking them, I guess, with every meal that might have them—and of course, avoiding those things would be the most important thing. But you know there's cross contamination, and there are just times, like you said, you have the cheat days or cheat meals. What's in your toolbox as far as how do you nourish these bacteria and get them to anchor into the digestive tract so that they're there for good?

Dr. Liu: That is one of my specialties. When I work with people, we rebuild the biome based on what the ancestral template is and all the research studies. And when we work together, I have three phases. So the first phase, we kind of identify all the biotoxins going on and then start doing some gentle weeding. And at the same time, we always seed the gut. There's always an introduction of all these good probiotics that we have.

In the second and third phases, we really start nourishing. And to nourish, we need food. But in order to get to the level that our ancestors had, which some

estimates are 120 to even 150 grams of fiber a day, boy, we have to be foraging all freaking day long. Give up our day job and just look for food and eat and cook and eat and cook it because that's a lot of fiber. So the last phases of the protocol I have, I work with people, phase 2 and 3 is more nourishing. And we kind of get up to, as much as we can, get close to 30, 40, or 50 grams of fiber a day.

And I have some concoction. It's known as Bionic Fiber. And people could just kind of mix and match. And depending on what's missing in the gut, I use certain more fiber to bring them up like the *Lactobacilli*. And there are certain strains I look at that are core, part of an ancestral core known as *Roseburia* and *Faecalibacterium*.

A lot of these eat our mucous. So we have to have a really healthy mucous lining. No yeast and pathogens or parasites there. But to nourish them, to get them to stay there, it's really helpful to have this Bionic Fiber concoction. And it's just a mix of different things.

So if someone kind of has more diabetic tendency and metabolic syndrome tendency or just struggling with overweight, I include more glucomannan. It's from the konjac root—

Dr. Davidson: Okay.

Dr. Liu: Found all over Asia, yeah. And that's super great. I love that. And it swells up a lot. So it fills people. If they tend to have—so it's like a mini gastric bypass because it swells up in the gut and will stop hunger immediately. But you have to drink plenty of fluid. And you cannot do it if you tend to get dehydrated because blockage can happen, which is very dangerous of course. So it swells up almost 25 times in volume. So I use that.

And then if people tend to have more IBS tendencies, I use more acacia. That's awesome. Nearly every study shows acacia helps with IBS whether it's IBS constipation or IBS diarrhea. And then I mix other things like Arabinogalactan, which is super helpful for immune enhancing in nearly every human study, it helps.

And it's because it feeds the strains that I mentioned to you earlier, particularly, *Bifido longum*. And it comes from all kinds of bark. The main source is usually a large tree, but it's a special fiber from bark. And our ancestral kind probably chewed on bark and made tea and had all kinds of exposure to bark.

If you're familiar with natural medicine, a lot of our natural medicines are bark sources from different trees because they have so many benefits, not just the medicinal properties but the fiber from there. If it enhances our good flora that means it enhances immunity because our good flora—our gut makes up 80% to 90% of our immune system. So we cannot fight anything unless our gut flora is there and the whole mucosal lining of the gut is healthy.

So there are other concoctions. Inulin is amazing, Inulin FOS, fructooligosaccharide. However, it's a FODMAP. So a lot of people in the beginning of a gut protocol, they can't tolerate fiber food or FODMAPs. Or even conventional fermented foods will make them ill because of the histamines in it.

So our particular probiotic, the Ultra Bifido Maximus, actually, they're all strains that are histamine free. So they kind of allow the gut to heal without too much histamine. And then later on, histamine-producing strains like *Lactobacillus plantarum*, which is found in sauerkraut, then we can add that it. But sauerkraut is a no-no for some people because the histamine will just set off a bunch of stuff because someone's threshold is already so low. They already have so many histamines aboard.

So there are so many ways to feed with inulin. However, I wait. Usually, not the first phase or two for some people because it's a FODMAP. And FODMAPs are shown to feed some of the opportunistic flora. They've learned how to eat good fiber from us. That's pretty gnarly.

I call them vipers. You don't want to feed the vipers in the beginning, although, there's always a risk-benefit ratio. You may be feeding enough of the good ones that would crowd out the vipers, but you don't know. And even when testing, it's hard to know. But I always do testing. I love to look at testing. So that guides a lot of the treatments. So we're not just shooting all in the dark.

Dr. Davidson: So as far as your steps you had, you said seed and then nourish. Were those the main two steps?

Dr. Liu: Right. Feed and seed them.

Dr. Davidson: Feed and seed them. Okay.

Dr. Liu: Yeah.

Dr. Davidson: So essentially, fiber is a food then for the bacteria to eat.

Dr. Liu: Yeah, exactly.

Dr. Davidson: So it's a fuel.

Dr. Liu: Yeah. We can't digest it. We just don't have enzymes to break that down. Some of them are cellulose. Some of them are called arabinoxylan. They're long carbohydrates. But even though they're carbohydrates—see, there are good carbs and bad carbs, just like Gary Taubes' book, *Good Calories, Bad Calories*. But there are good carbs and bad carbs. We always think of sugars are bad. But some of these are linked up sugars. But we can't break them down. Only our gut flora can.

Dr. Davidson: Yeah, like inulin is one of those.

Dr. Liu: Yes. Exactly. Right.

Dr. Davidson: Okay. Yeah, where it's a food for the bacteria. Even though it's a carb, our body doesn't break it down. The bacteria does. So it ends up being food to fuel the bugs.

Dr. Liu: Precisely. Right. And some are stronger fertilizers than others.

Dr. Davidson: Awesome. That makes so much sense. What's your clinical opinion about—and not referencing antibiotics, because I'm obviously not a fan of those types of things. But referencing things that would maybe go after some of the pathogenic bacteria in the gut before you even start seeding good bacteria in, almost like you're clearing real estate out or trying to affect the levels and then seeding it and then feeding it.

Dr. Liu: Exactly. So I use a lot of plant botanicals and a lot of fatty acids. For some reason, fatty acids break the cell wall down of yeast.

Dr. Davidson: Oh, okay.

Dr. Liu: There's lauricidin from coconut oil, caprylic acids from coconut oil. I use a couple of different fatty acids from castor bean, which is super toxic in the natural world because ricin comes from it. But these are all super extracted. They're very pure. And they don't have any kind of hemotoxin in it.

But one is called undecylenic acid. It's 11-carbon fatty acid coming from the castor bean. And it's super helpful. It's very gentle. It's known as being fungistatic. So it helps to lower the Candida count. And I never use it alone. I always add other things with it to kind of bulk up the activity and the keep the

doses low. So there's a lot of synergism. There's a lot of team effort. Low doses, that means less toxicity.

When I entered functional medicine, I was trying to heal myself. I had gotten a lot of damage from really, really toxic, super bad birth control called Mirena, a progestin, which give me like heart failure symptoms and just made me super overweight and very problematic.

Dr. Davidson: Wow.

Dr. Liu: Yeah. What happens is those progestins and any kind of like a foreign hormone like estrogens dampen people's immune system. So then all these pathogens can flare. So I had to learn how to fix all that and get the yeast out.

Dr. Davidson: Is that in the same category as birth control as well too affecting the microbiome?

Dr. Liu: Yeah, it is. It's levonorgestrel. Yeah. So that's the same effect with birth control. That's why there's a lot of B vitamin deficiency with birth control because it disrupts the gut. And then they don't make vitamin B12 and other B vitamins, folates for people. And then they can start going crazy because you need B vitamins to support your nervous system.

Dr. Davidson: That totally makes sense. And I was thinking too a side note when you were talking about the *Lactobacillus plantarum* being in sauerkraut and more of a histamine producing so the people that have histamine sensitivities, which you see a lot of that in the whole FODMAP category, especially when people are in a really tough state.

I found clinically really helping the liver, and specifically the left liver lobe, is what basically makes histamine. And you can affect the draining pathway of that. It tends to allow people to not be as sensitive to histamine. But obviously, that's very case dependent on a person.

Dr. Liu: Oh, that's fascinating. Oh, I didn't know that. Yes. We do make histamine because it's such an important signaling molecule. It turns on all our acid pumps in the gut that we need to maintain a sterile state in the stomach and prevent pneumonia and other things. I didn't know that. That's awesome. What are your favorite liver support items?

Dr. Davidson: There's a company called Systemic Formulas, and they have a formula called ACX, like Apple, Charlie, Xerox, A-C-X. And it's specifically designed for the left liver lobe with histamine production. So it's mainly like a drainer type of formula to try to clear that out because it's the buildup it

seems like of histamine that people have reactions to. They can't clear it out. So I guess something I found clinically to help people that are getting to that sensitive histamine state.

Dr. Liu: Oh, yeah. That's awesome. Yeah. In the first phase, I use a lot of histamine blockers.

Dr. Davidson: Okay.

Dr. Liu: And inflammatory blockers like LOX inhibitors like Boswellia, which has mild antimicrobial effects as well. But it breaks biofilms, I believe. Somehow, it nurtures and releases biofilms. It's part of the frankincense family. And frankincense has all these like amazing properties to enter into different lymph circulation areas.

Dr. Davidson: Yeah. Absolutely.

Dr. Liu: Yes. So I wonder if this does also for the liver. That's amazing. Yeah.

Dr. Davidson: Yeah. Well, in Boswellia, in the enzyme category, enzymes are great to eat away at biofilms.

Dr. Liu: Yes. Yeah.

Dr. Davidson: And it almost cleanses the blood too. So that's cool.

So getting you back on topic about the gut, you mentioned testing. I always like to do testing. How often do you test? Is there a certain test that you favor? You mentioned the uBiome—

Dr. Liu: Yeah.

Dr. Davidson: As far as labeling bacteria, but you can talk more about that.

Dr. Liu: Yeah. So uBiome is awesome, but it's limited because you can't see protozoa. You can see bacteria only. But also, in the gut, we have viruses. Currently, I don't have a good way of checking out viruses. But protozoa, like *Giardia* or *Entamoeba*, you want to see if these are living there because even a small amount will disrupt the gut, and then people can't digest. And then they may have different food allergies, high blood pressure, high blood sugars, being overweight and challenged—brain fog, fat, and fatigue. So I check for those kinds of parasites on different testing.

There is a whole bunch out there; Diagnos-Tech, DRG labs. The new one on block I love is called Diagnostic Solutions. They have something called a GI map. It's a pathogen screen. All these, I have on my website if people are interested in looking at it. Or ask any functional medicine doctor like yourself. We have access to order all these.

My gold standard that I love to use—there are two actually: the CDSA, comprehensive diagnostic stool analysis. A couple of companies make it. So there's no dearth of that because they culture. And then you can really see what the faculty of anaerobic bacteria there are. And those don't show up on uBiome, so it's helpful to see that. But there are many companies that make the CDSA: Doctors Data, Great Planes, and Genova.

Genova is amazing because for over 20 years, they've done molecular characterization of the gut. And their newest test combines old technology CDSA with the advanced—all the DNA PCR technology. So it's awesome. And so they look at 24 strains. They quantify them. And then they also do the stool culture. And then they use microscopes so they can search for parasites. So that's the most comprehensive tool I use.

And like you said, don't guess. It's better to test. At least, we're heading somewhere. And it helps me to track. I have a lot of clients that are bio hackers. So we have numbers to track. We can hack things looking at the populations of the gut, how they feel.

There's a big mind, body, and gut component. And when we see certain strains bloom and they feel better, especially the *Bifido longum*, we can track that and see it bloom and see all the bad flora go down and other good flora go up. That always translates to less depression, less anxiety, less agitation because all these flora makes GABA.

And GABA is our chillaxing hormone and neurotransmitter. *Lactobacilli rhamnosus* and several others that are found in Ultra Bifido Maximus or in other products out there, they make GABA. And that's why people are so uptight these days. Their gut has been totally hacked by all these antibiotics or pesticides in the food.

Dr. Davidson: I love that, chillaxing. You don't hear many doctors reference that word.

Well, I'm personally excited. I mean, obviously, testing just keeps advancing. But I think about the whole digestive tract and identifying bugs and understanding more and more in the bug category. And I personally feel, like 5

or 10 years, I can only fathom what kind of testing will be available in our understanding of bugs because I just feel like we're on this exponential growth of identifying more and more bugs and understanding the relationship between each one of them, too.

Dr. Liu: Oh, yeah. There's so much we're learning. Even with *Spirochaetes*. With the testing, sometimes there's a way the gut, and along with Lyme even, we can track the *Spirochaetes* that may be being secreted. There's good *lactobacilli*. I've mentioned a lot of the good *Lactobacilli*. *Plantarum* and *rhamnosus*, those are the two main ones.

There are also bad *Lactobacilli*, actually, a lot of *acidophilus*, which is in commercial products as well as a lot of yogurts. But they make people fat and foggy often. And that's because it can eat starch.

So you know how heavy the Western diet is, very heavy, heavy in refined carbs, refined grains, and starch.

Dr. Davidson: Yes.

Dr. Liu: So when that overgrows, studies show, these are associated with disease: autoimmunity, colon cancer, anything or everything out there, celiac, depression, mood disorders. Whereas, when there's plenty of the good ones, *rhamnosus* and *gasseri* and a whole range, diverse ones, that are not starch eaters, they tend to be healthier. People tend to be healthier.

And then the same with *Bifido*. So there's the *longum*. It eats mucous and fiber. There's starch-eating *Bifido*. Like you see *adolescentis* everywhere. It's not a great probiotic because you never see it in high population in healthy people. You will see *longum* in high population.

And same with *animalis*—well, *animalis* is not really found in humans. There are small amounts found in humans. And it adds diversity, but it's never in domination. But in obese people, people with diabetes or type 1 diabetes, autoimmune diabetes, it'll be in higher concentration, or colorectal cancer. It's because it's taken over because someone is eating a really starch-heavy diet. And that person has become depleted from the good flora that protects the gut guardian, the *Bifido longum*.

So in each family, there's always a kind of healthier good version and kind of hooligan not-so-great version. And these can be determined by diet and fiber concoctions. But also the same with *Spirochaetes,* so *Spirochaetes* in nature, I found out, pigs and a lot of animals that root in the dirt. They tend to have

good *Spirochaetes* and good *Treponema*, which normally, *Treponema*, we would think of is related to syphilis.

Dr. Davidson: Yep.

Dr. Liu: But there's actually good *Treponema* found in dirt and in termites and other little insects. These break down cellulose and all kinds of amazing wood fibers. And in Burkina Faso, the kids and adults there, when they needed protein, they actually eat a lot of grub including termites and other grub that are really high in, actually, *Treponema*.

I kind of belief if we have enough of the good, it offsets bad. I have a theory kind of about *Spirochaetes*. There are probably good versions, and they may fight off bad. But definitely, what's true for *Lactobacilli* and *Bifido* and others in different genera—there's always kind of better versions that are found in healthy people controls. And then there's dominance of not-so-great ones found in disease state controls.

Dr. Davidson: Interesting. So I have to ask you about diet because you talked about eating grubs, termites. Talking about really like chewed-on bark and a lot of ancestral things. So what are your thoughts on optimal way of eating whether it's Paleo or SCD, AIP, GAPS, I mean where does that fit into affecting our microbiome?

Dr. Liu: So I love all those diets, and I think when we learn more from our ancestry and nutrigenomics, everyone is going to have their unique diet that's going to be optimal for their health. And we still have not a lot of information about that. There are a lot of theories, and people feel good on certain things. I think it might come down to, eventually, we'll know with the metabolomics like knowing what metabolytes are in the body and how the food reflects on that. Then you can take a diet that lowers all the inflammation markers.

And there's one group actually in Israel that has done that. It's Eran Segal's group. They actually gave people certain foods. Even if the food was high GI or low GI, people would have a certain blood sugar response. So some people would eat a tomato and have low blood sugar. And then other people would eat a tomato. Because their gut microbiome was different, the composition of the flora were different, they would actually get high blood sugar reading.

Dr. Davidson: Interesting.

Dr. Liu: Yeah. Isn't that fascinating? Yeah. So all we know about glycemic index, GI is kind of bull***—sorry, speaking pun—because it's dependent on our poop and the flora.

Dr. Davidson: Yeah. Our microbiome.

Dr. Liu: Yeah. They can transform it to gold and magic or to madness.

Dr. Davidson: From what you're saying and what I gather you're going toward, I really think that is the future of, I wouldn't say medicine, but the future of understanding how to optimize health is getting an individual blueprint for you because obviously, everybody is different in our responses to things. I think that's why there are so many different diets. I mean you look at how many diet books are written every year. And you can have 10 bestsellers at once. It's like, well, what's the right one?

Dr. Liu: Well, you can write 10 of them, Dr. Jay? And they'll all do well. That's what I plan to do. No, I'm just kidding.

Dr. Davidson: So let's dive into a little bit more about there's a type of bug that you mentioned before we started that you kind of wanted to talk about, *Eubacteria limosum*, and its effect on estrogen. Can you dive into that and what some of the studies are showing about that bacterium?

Dr. Liu: Totally. So I love looking at centenarian studies because they explore so much about longevity and leanness. They're all generally leaner than average. And generally, because they are centenarians, there's something special about them that set them apart that they can live to over 100, usually with great health. They're really active in their communities, serving their community and family. Essentially, they're disease free: cancer free, coronary artery disease free, autoimmune disease free. So what's so special about them?

So there's a researcher named Biagi in Italy. And this researcher has done a number of different centenarian studies. And I plan to do a fieldtrip some day there to visit. But she looks at centenarians. And then what has been shown over and over is that there's an enrichment in the core microbiota that I mentioned to you earlier, *Bifidobacterium longum* and then a couple of other ones, *Akkermansia* and *Christensenella*. I call these the ABCs.

Dr. Davidson: Okay.

Dr. Liu: Yeah. And then there are other strains, Roseburia. I call her Queen Roseburia. This break down our really good fiber and Inulin. And then they

guard the gut, and they protect from all kinds of allergies and permeability issues.

Anyway, what was super enriched other than ABCs, *Bifidobacterium longum* and then *Akkermansia* and *Christensenella*, what was really prominent was there is a 17-fold increase in one flora known as *Eubacterium limosum*. And this ate a whole diverse kind of fiber, all kinds. And it could transform ordinary estrogens from the diet—they're known as phytoestrogens from beer, hops. And it can make them into super steroid anti-inflammatory compounds. And they had enrichment.

Dr. Davidson: Wow.

Dr. Liu: Yeah, 17 fold. We all have a little bit of *Eubacterium* in similar strains to *limosum*. We can definitely nourish it by eating plants that have different bitters and different phytoestrogens. And these are nourished by all kinds of fiber and not eating sugar and not having yeast and pathogenic bacteria overgrowth. That's how we can nourish *Eubacterium*.

Dr. Davidson: So in other words, the research of Biagi in Italy looking at centenarians, basically cultures or colonies that have a high prevalence—

Dr. Liu: Yeah.

Dr. Davidson: Of reaching over 100 years old. So they had more of this *Eubacterium limosum* than "other populations"?

Dr. Liu: Well, compared to other elderly. The other elderly don't have as much *Eubacterium limosum* or even none.

Dr. Davidson: Okay.

Dr. Liu: I've actually seen it on a couple uBiomes. But the fidelity on uBiome wasn't awesome. So I didn't know if they are accurate or not. But I've seen it on a couple people. And I was like, "Oh man. I wish I could lick your poo." But it's not in a probiotic currently yet.

Dr. Davidson: Well, there are fecal transplants, of course.

Dr. Liu: Well, you have to be careful where you get it from because you'll get someone's viruses, phages, and all funky kind of fungi.

Dr. Davidson: Yeah.

Dr. Liu: You got to be careful for *Spirochaetes.*

Dr. Davidson: Yeah. Well, I think that's the next world, too, is the microvirome, understanding the viruses that are more prevalent even than the bacteria. So in other words, for longevity, this *Eubacterium limosum* could be basically a bug that could increase longevity then?

Dr. Liu: Well, it's not been put into animals. I haven't seen studies like that.

Dr. Davidson: Okay.

Dr. Liu: So it's just a correlation that I think is interesting. But just like *Bifidobacterium longum*, I find that there are enough correlations. I don't need 200 human RCTs to tell me something is true or that the sky is blue. But there are strong correlations.

And probably what we'll find is that it contributes to health greatly. Because we do know, too many estrogens aren't good, and we need strong steroidal anti-inflammatories for good health. But it's probably going to be similar to *Bifidobacterium longum*. Like for instance, when I parse different studies that I'm reading, if I look at the celiac population, they usually have zero *Bifidobacterium longum*. But you look at healthy moms in controls, they have lots of *Bifidobacterium longum*. And they don't have gluten and gliadin issues.

In a Petri dish study, if they put *Bifidobacterium longum* into the Petri dish, it will break down gluten and gliadin and also reduce enteropathy, reduce inflammation related to gluten and gliadin. So I think with *Eubacterium*, when they do more studies, it will have some very interesting properties.

One thing for sure that's really interesting is that it makes a lot of acetate, which is like vinegar. Vinegar has a lot of amazing health properties. Yeah, it can lower blood sugars for people who ingest it. There are many mechanisms why that happens. For one, it's antifungal, I love cleaning my house with vinegar. It can get rid of a lot of molds and spores.

Dr. Davidson: Yes.

Dr. Liu: Yeah. So I think it has a similar benefit for humans in our gut lining when we have these acetate producers. This one is special. It also makes butyrate. Butyrate is that really stinky smell from cheese and butter. We need buttloads of butter and butyrate. So this one does both and that's really special.

Dr. Davidson: Wow. You're such a wealth of knowledge and definitely just not holding back. Again, I don't hear too many docs say chillaxing and just…

Dr. Liu: Todd LePine does. Sorry, Dr. LePine. He's really amazing. I don't know if you're going to interview him, but he's like one of my IFM mentors.

Dr. Davidson: So kind of wrapping up our interview. Is there any final thoughts or at-home recommendations or things that you want to leave listeners of The Detox Project with?

Dr. Liu: As we all know, we can struggle with fatigue or brain fog or body fat issues when we have a lot of toxins onboard. And I just want people to know by focusing on the gut microbiome, we can alleviate a lot of this. It's not that hard at all. And there are so many tools at our fingertips right now. So I'm just so grateful for this opportunity that I could share some of it with your listeners. Thank you so much.

Dr. Davidson: Yeah. Yeah, I really want to thank you, Dr. Grace Liu, for joining me on The Detox Project. I think just bringing tons of value. And I mean just a huge takeaway that I've gotten is not only, obviously, we want to avoid toxin exposure or reduce that as much as possible, remove the source—

Dr. Liu: Right. Yeah. Right.

Dr. Davidson: Or stop the influx, but it's literally our gut guardians, as you say, can be the frontline for even exposure for minimizing that for our bodies and allowing it to do the battle for us. So we don't have exposure to that or really absorption of it.

Dr. Liu: That's precisely it. Yeah, we've lost them. We didn't intentionally lose them, but we have. But we can get them back. Not all of them necessarily, because we're not going to be digging in a jungle or in the dirt, desert dirt in Burkina Faso. But we can get pretty close.

Some of these that I've mentioned also are in sheep poo and goat poo, like *Eubacterium limosum*. That's one of the origins. And I mentioned soil probiotics. Some are from forest ecosystems and other environmental—another really great one, I have it on my store. It's called Equilibrium. Sorry, I didn't bring it up earlier. But that's an environmental one. But we have so many tools at our fingertips, and it just requires a little exploring and going through the route of testing and not guessing, I think.

Dr. Davidson: That is just great. Well, yeah, I want to thank you for taking time out of your schedule to share your knowledge and what you've seen in research and just practicality to this topic.

Dr. Liu: Great.

Dr. Davidson: Awesome. Well, definitely, take this life-saving, life-transforming information home with you about The Detox Project by clicking on the banner beside or below. And definitely share this with your friends and loved ones. Post it on Facebook. Let them know you've been listening to some great information on The Detox Project.

And don't forget to visit Dr. Grace Liu's website. You can find all the information and get connected to her. Her website is thegutinstitute.com. Thegutinstitute.com. You will not be disappointed.

Maximum blessings. This is Dr. Jay Davidson.