# Paleo Solution - 312

**[0:00:00]**

Robb Wolf: Hi folks Robb Wolf here, another edition of the PaleoSolution podcast. I'm very excited for today's guest, Dr. Tim Gerstmar. He is an expert in quite a very variety of topics but today we're going to shift gears and talk about something that's quite important but has not received as much airplay as what it likely deserves and that is obesogenic substances that we find in our modern environment. Doc, how were you doing?

Tim Gerstmar: Hi Robb. It's awesome man. I've listened to your podcast for a long time. We connected a lot of years ago and so I've been watching your writeup. I'm really glad of the messages that you've been getting out to people and I'm excited because when I contacted you about this, this is just something I find, though, it doesn't get a lot of airplay. It's a little rough. What we find is, we start talking about this stuff kind of halfway through, people are like trying to hide under their desks and stuff and just feel a little overwhelmed by this topic but we want to bring it up.

Robb Wolf: Right, absolutely. Before we jump in on that, Doc, you have a really interesting background. You've lectured in educated people on a wide variety of topics ranging from methylation to the importance of the gut microbiota before the gut microbiota was a nearly household term, at least household term in certain nerd circles. Doc, talk to folks about your background. You have an interesting pedigree, given that you started off with kind of a philosophy background before heading into medicine.

Tim Gerstmar: Yeah, that I bet you can -- people out there can empathize. My parents weren't super happy when I changed from engineering background to a philosophy background back in college. That didn't go over so great. But looking back, I really appreciated it. It really gave me a lot of critical thinking skills. It really let me look at kind of what we call these larger meta-ideas that sort of govern the tracks that we get into the thinking and realize that some of this was going on.

Like most of us had personal family issues. My dad had a really bad stroke and I really got -- went ahead first into the medical system like it was there with all the visits from the hospital, kind of all the way through that and decided I was going to go down the medical, the rabbit hole, changed my direction of my life.

I went and sat and talked with some MDs and I'm really grateful. They kind of really gave me the unvarnished look of what was going on for them and urged me that the path I was looking to go down was wasn't that one. So long story short, I got into naturopathic medicine so I know our history is kind of aligned there a little bit, Seattle, right? We went there and grateful to my profession.

We've been banging the drum about the importance of the gut and gut health for 90 to 100 years now and you go back to those old concepts of endotoxemia and internal poisoning and everything that we thought was that modern medicine, so to speak, thought was just junk and now we're seeing it validated. A little different than they thought back then but that the gut biome is playing this huge role and so just grateful. I contacted with Dr. BG and we were lucky enough to give a talk on gut health back at the Ancestral Health Symposium in 2011 and then to watch it explode and come out an importance and God, we just know so much more than we knew five years ago. I'm excited as heck for like the next five years what we're actually going to figure out.

Robb Wolf: Yeah, I'm actually working on my second book currently and maybe halfway through it. I just wrote a section on the gut basically explaining much of what you just described. You know, that most traditional medical systems looked at the gut as kind of the root of most diseases. It's really fascinating to me too that the term hypochondria which is usually ascribed to people, malingers and people who are faking illnesses that was all in their head or what have you but if you really break down the Latin root of hypochondria, "hypo" is beneath and in "chondria," it can be cartilage or more specifically ribs but they're saying below the ribs, basically.

Tim Gerstmar: Oh, fascinating.

Robb Wolf: Which is the gut.

Tim Gerstmar: Right

Robb Wolf: And so unbeknownst to modern allopathic medicine, they correctly ascribed the term hypochondria to this miasma of problems that they couldn't diagnose, they couldn't really address but then they incorrectly said that it was just all happening in the head which now with like the lymphatic system, the gut-brain axis and all that. It's like, well, actually it is happening in your brain.

So it's fascinating to me that on some level either accidentally or instinctually, hypochondria actually is of much more applicable global term than what most people have ascribed to that. But I went through quite a bit of that history, so I feel a little bit validated that I wasn't just fully pulling that from another region.

**[0:05:18]**

Tim Gerstmar: Right, well, yeah. I mean you're on it and if we look it like traditional Chinese medicine, if you look at Ayurveda, which is like the healing system from India, you look it like I said even Hippocrates and these guys like the roots of western medicine, and pretty much we can say, hey, kind of their understanding of exactly how it worked like four humors and not so much and in all that stuff. But their basic insight that the mind plays a role in disease, that the gut plays a role in disease, that all these stuff.

I will put a plugin like just recently, I was looking more into that the mind disease connection. There's a great book that I liked called the, "When the Body Says No." It's by this Vancouver MD, Gabor Mate. He's also got a really good one on addictions and just over and over showing how mental state programs into stress response, which then influences the immune system and the other systems of the body and predisposes to disease and it's just to me absolutely fascinating stuff.

Robb Wolf: Dude completely. One line I drew in my book yesterday and this morning I forget because it all starts running together. But I said, the next five years, we will learn more about the gut microbiome and its implications are in health than we've learned to the previous 100 years.

Tim Gerstmar: Absolutely.

Robb Wolf: So way it is very exciting times, yeah.

Tim Gerstmar: Yeah, we go back, Grace and I go back and look at our 2011 talk and you're kind of like covering your head, going damn. The amount we didn't know then and it's exciting to think five years from now we'll look back and go, man we'd still moved so little.

Robb Wolf: Right

Tim Gerstmar: About what we're going to learn so…

Robb Wolf: Right, yeah, well but you got to put it out there and then most of it is going to be wrong but that's how the process moves forward.

Tim Gerstmar: Well, the way I look at it is, look I'm a clinician like I'm not a scientist, right? In the sense that it's like my job is to try to help the people who were in front of me and so while and I'm trying to push the boundary. What got me into all these things, the microbiome, mind-body medicine, we're going to talk about endocrine disrupting chemicals of obesogens, all these different things, right? It's just trying to push that boundary and sick people are sitting in front of me and we're going, man, like I've used this stuff that sort of proven to work and maybe it helped a little or maybe it were blocked and it's not working and like what else can I do. The conventional system is just like, hey, sorry we don't have anything else right now and it's like, dammit that's not good enough.

Robb Wolf: Right.

Tim Gerstmar: You know what I mean. It is like so I'll try stuff and it's like, hey and you're honest with people like, well, like let's give it a try and see what works. Here's the pros. Here's the cons. And sometimes we go down dead ends and reflect the microbiome. I mean some of the thoughts we had that you're going to look back and go, like that was wrong or pretty rude or pretty crude or whatever but we got to keep trying because there are more sick people. I mean, a stuff that scared the hell out of me the other day, Robb, I know because you have little kids too. It's like they're saying 54% of kids nowadays have a chronic health condition.

Robb Wolf: Right.

Tim Gerstmar: So more than half of kids are sick now with asthma, eczema, allergies, autoimmune disease, like neurodevelopmental diseases and stuff. It's like, dude, that is freaking terrifying.

Robb Wolf: Right, right. We had some interesting implications coming up with all those. So Alexander Fleming developed antibiotics in the late 1920s. They really started to coming into pretty popular use late 1930s, 1940s and so we've had three to five generations where people have been getting a descent exposure to antibiotics and what are the implications there for the gut microbiome. We know that these antibiotics at certain points can clearly save your life.

Tim Gerstmar: Absolutely.

Robb Wolf: Like sort of a septic infection, so not discounting that but there's always collateral damage and unintended consequences. So we've got generations of people that have been using antibiotics. C-sections and lack of breastfeeding have become more common overtime.

There was just a really interesting and also kind of scary mouse study that seem to indicate that the loss in microbiome diversity and subsequent health problem seem to be heritable and it seems to accelerate over the course of time. On the one track, we could blame a lot of this stuff on increasing levels of refined foods and the growth of the junk food industry and I think that that's definitely a place to look. But then, in the background also, we have massive amounts of antibiotics being used in our food system, maybe over utilization of antibiotics for conditions that really are inappropriate or maybe even if they are appropriate, they're just collateral damage and ease the problem or part of the problem that we're seeing today just the fact that we're now three to five generations down this new path and there may be some really negative consequences of that. I'm not saying that there are but what if that's the case, what do we do about that?

**[0:10:40]**

Tim Gerstmar: Well look I'm personally, I buy you into that. I mean I can tell you again kind of anecdotally, right? One of the guys who was kind of a really big figure in my profession, he practiced from about -- if I'm remembering right, about 1910 to about 1950 and he said after World War II, something happened. All of a sudden, people that he used to be able to the treat get better pretty quickly. All of a sudden they were taking like twice as much treatment after World War II to get better.

He never had an answer of why. He thought maybe it was, again, an increase in like pesticide and chemical use, maybe it was some change to the food or something was going on but his personal experience was all of a sudden, people were a lot harder to treat. Then one of my mentors, he began practice in the '70s and he even said from kind of the '70s into the 2000s, disease like got 20 years younger that if someone who was 50 and have this disease now he was seeing 30-year-olds with that disease.

Robb Wolf: Right.

Tim Gerstmar: So, I know it's not the same thing. There was this famous trial Pottenger's Cats, right, where pets more in nutrient deficiency and everything. But he saw kind of through successive generations that these cats through got sicker and sicker and sicker and then when he flipped it around, he saw that it took several generation like that individual cat could get healthier but only so much and then it took a couple of generations to rebuild the health in that person.

Robb Wolf: Right

Tim Gerstmar: And this is like where we get into the sort of what we call responsibility versus blame, right, in the sense that your health maybe hampered by choices that your grandmother made.

Robb Wolf: Right.

Tim Gerstmar: Right and there is, whether, it's like your pancreas didn't fully develop because of certain changes and leading to like blood sugar irregularities or like on and on. We'll talk about some of that stuff. But you may just have to accept like, there may be a ceiling to what your health can be and that sucks man. I mean, you may eat right and exercise and sleep and do all these things and you may never be like perfectly healthy and we may just have to wait, you do your part and your kids do their part and like your grandkids come down the line and now they are in a much better place than you ever where at. I don't know but epigenetics tells us that this stuff, what our ancestor -- and this -- it can suck, right? What our ancestors did can affect us.

Robb Wolf: Right, right, I kind of wonder if that's a bit of the crosshairs that have been leveled on me. My mother smoked while I was in utero. I had a normal birth but no breastfeeding. I was on loads of antibiotics and mom was sick all throughout her life, rheumatoid arthritis, lupus and undiagnosed at that time. It was many years later before she was diagnosed.

But we know now that we see gut microbe changes in these disease conditions and still not 100% clear to me. Does the gut alter -- gut alterations cause the disease, does the disease cause the gut alterations it's a little bit of both. I'm not entirely sure but clearly there's a heritable factor there.

I've been actually talking with Grace quite a bit and she's like we're going to fix your gut and you're going to be eat gluten again. I'm like, dude, if could just get to where I don't have to run to the bathroom from a cross-contamination on a grill.

Tim Gerstmar: Right

Robb Wolf: I'll call it good. So I'm not going to shoot for the stars. I'll shoot for over the next hill and I'll be pretty happy with that but yeah, it's very interesting.

Tim Gerstmar: Well, it's like it goes both ways because on the one hand, we want to be like hey, don't be defeatist and let's not be defeatist. Let's see how healthy we can get you.

On the other hand, we want to be like hey, have these unrealistic expectations that like, hey Rob you can eat bread all day long and you'll be perfectly fine. It's tough. It's a tough balance where to land people. Like I said, when we get into the environmental toxicity here, I can feel pretty overwhelming because let me bring up another point. So we've got direct exposure to antibiotics, right, which is you take them or secondary like your food takes antibiotics and you eat that but then we've got the fact that when they test the ground water, they test the water coming out of whatever it is where you're getting your water, we're finding drug contamination, right, in the water. And so you're getting exposed to things that way too.

**[0:15:28]**

Robb Wolf: Which is a little bit of the impetus why we moved out to a small farm and we have well water and we tend to have it thoroughly tested before we moved in. It's about as good as you could possibly get but it's a tough thing to escape from. We go out and sit in cars that are mainly plastic. I got a new office downtown which the folks were super excited to show me the new carpet and with the hermetically-sealed windows that I would need a break and a crowbar to be able to open them up and get some fresh air in there. I'm just basically sitting in a volatile organics stew while I'm writing and whatnot.

Doc, it just seems like there's two camps with this stuff. On the one hand, we have a lot of folks that think that like scented candles and plastic over their furniture seems like a good idea and then and those people always seem to be super sick and kind of screwed up. And then you've got this other side where people are in terror of, again, like riding in a new car or something because of these compounds. First, talk to people a little bit about the xenoestrogens or these obesogens. What are they and where they typically getting exposed to them?

Tim Gerstmar: Yeah, so look we've put out, I mean, you're going to see estimates vary all over the place, right? But mostly since World War II, we had this industry gear up and create these novel compounds, right?

So let me back up for one second. So that the common argument is like, oh detoxes are stupid. It's a waste of money. Nothing really happens. You have a perfectly good liver basically in your body already so therefore, we don't need to do any of this stuff.

Look I mean they're right, we've got these great detox systems built into our bodies. They've been there, forever and ever and they do a pretty damn good job of getting rid of stuff and that's all great. I mean the biggest source of toxicity in our lives, right, is mainly plants, right? I mean, you've going on about this at length like they're masters of chemical warfare and they make lots of compounds that when we eat them, our system has to detoxify and get rid of them, right?

Robb Wolf: Right.

Tim Gerstmar: I mean, broccoli, right, your premiere like one of the super stars. There is a compound in there called sulforaphane and it is awesome. It up regulates all of these antioxidant defenses and things like glutathione, maybe people might have heard it before and it's anti-inflammatory. It's awesome but we've actually seen, actually, the way that it does that is the body doesn't like this chemical all that much and so then it sort of, in that hormetic idea of ehh like there's this little bit of something I don't like and I have to gear up to get rid of it, right?

Robb Wolf: Right.

Tim Gerstmar: So we have these great detox systems and that's all in good. But then we go and make like synthetic compounds that have never existed before. So this system that's evolved to deal with all of these environmental compounds from plants, from like volcanic activity and fires and venoms and things that we have run into. But now we put out stuffs that sometimes fits well into those detox pathways and sometimes it really doesn't and it's hard as hell for the body to get rid of and then we just increased the amount.

So I just saw something the other day that it scared the hell out of me. It's saying that the xenoestrogen is estrogen, right? "Xeno" just means foreign, alien, outside the body. So when you stick xeno on the end of any word, it just mean something from the outside. So xenoestrogen is a chemical coming from the outside that is or acts like estrogen in the body, right?

And they're saying, I know because you got little girls and I have a little girl too. They're saying the xenoestrogenic load on girls now to be higher than their own endogenous or the amount their body makes level of estrogen, right?

Robb Wolf: Wow.

Tim Gerstmar: So they're getting more estrogen coming from outside themselves than their own body produces. We're wondering and it's not just one reason like but we're wondering why at the age of puberty, it keeps falling lower and lower, right? It's like precocious puberty now if I remember right, it's eight, which just like scares the heck out of me to think, an 8-year-old starting to go through puberty.

**[0:20:11]**

Robb Wolf: Right. Well I mean there's all these implications with like androgen-driven cancers which seem to become more aggressive with exposure to estrogens possibly xenoestrogens. You have these young women experiencing many, many more menstrual cycles which also may have some implications with health over the long haul so it's, yeah, it's pretty big stuff.

Tim Gerstmar: I mean I don't think there's just one answer, right? We can talk about higher body fat, higher insulin levels, higher, this that and the other thing are all… I mean this is the thing, right? This is the thing that usually people discount this whole toxicity thing and it's like well, where are the studies? For most people, it's not like the batman villain where they fall in vat something toxic, right? And they come out and like clearly, that was the thing that caused this issue to go on for people.

It's the fact we're in a stew now. And what they're finding is, when they're putting these compounds together instead of just testing them singly, in a lot of instances, they're finding out that that combo is actually a lot more toxic than the individual compounds by themselves.

Robb Wolf: Well, I had a fair background in toxicology and one of the methods that's used to check the toxicity of a substance looks like at the mutagenicity within a cell line, which can be informative. But then circling back to the gut microbiome, for a long time we've forgotten that there are trillions of these little organisms with genes and enzymes that are completely different than the ones that we carry and often times and they may have an effect on these chemicals. Sometimes just beneficially neutralizing them in a way that's actually helpful for us.

But we're discovering now that sometimes they modify both natural substances and artificial substance, in a way that makes that item look relatively benign from say like in mutagenicity cell line standpoint. But when we take it in and it's part of food or water and it gets exposed to our gut microbiome, the gut microbiome can change it in a pretty dramatically negative way.

Tim Gerstmar: Yeah, absolutely, I mean and there's just along that lines, there's another issue, is that there's one whole like not to get too nerdy on people here Robb, but there's a whole class of these detox enzymes driven by something called the pregnane X receptor. New work has shown that rats which are one of the -- our lovely rat friends get -- everything gets tested on them and they're finding out that in that way their detox system is really different from ours and they respond differently. So the toxicology done on rats doesn't necessarily mirror the same kind of toxic effects that we see in human beings with this stuff.

Robb Wolf: Absolutely.

Tim Gerstmar: So we got to try and try and stay roughly on track here for you here, Robb. We've got all these chemicals that we put out in the environment and the U.S. has taken the really prudent stand of innocence until proven guilty on most of these stuff. And then we go back and test it and we go, well, crap that didn't look like that was too smart. We got like these polychlorinated biphenyls, which were banned in the '70s and it's still like all over the place, basically. Some of the stuff just DDT and that kind of stuff just doesn't really break down too well.

So we've got this huge load. Let me just see. I had this -- let me grab it real quick. There was a stat here which to me was just staggering about the toxic load that were under. One second, well, let me in the meantime while I'm pulling this up, let me say there was a cool study I saw too, Robb on kimchi and the bacteria that they isolated from kimchi. It was shown that it broke down bisphenol-a which a lot of people have heard about which is one the xenoestrogens that we talked about. So there's some excitement again that gut microbiome like it can't get away from it.

Robb Wolf: Right, so Doc, that's a great question or maybe a direction to head into. Let's just focus maybe a little bit more in kids but I guess…

Tim Gerstmar: Sure.

Robb Wolf: It applied to adults. How are kids getting exposed to things? I mean there's some kind of obvious stuff like plastic wrapping, new carpet all that type of stuff but what about like these theoretically benign plastics and like Camelbacks and water bottles and all that type of stuff? Like how stable are these items compared to using like a glass jar?

**[0:25:23]**

Tim Gerstmar: Yeah, so totally, let me go there. Let me -- I've pulled up that stat. Let me just tell you. So I'm just going to read this, just part of this real quick. So under the EPA inventory update reporting program, the chemical

manufacturing industry estimated that approximately 27 trillion pounds of chemicals were produced or imported into the United States per year in the early part of the 2000s, which is the equivalent of 74 billion pounds a day or 250 pounds a person and that's not including fuel, pesticide, pharmaceuticals, or food products. So there's a ton of this stuff floating around.

So, yeah, to go back to kids, right? So we have this double issue with kids. They're smaller. Their detox systems don't work as well as adults, again, so a lot of this stuff was done in adults but not so much in kids. So when we're looking at exposure, right, it's basically, how can stuff get in to you. So we think of stuff you put on yourselves. So this is typically more women but men too, right? So like personal care products from shampoo, to lotions, to moisturizers, aftershaves, and deodorants like on and on and on. The stuff that people put on their bodies so kids hopefully put less stuff on themselves than adults do but stuff you put on in your body. Stuff you breathe so like yeah, you breathe that new car smell. That's the plastics that are in the car off-gassing chemicals into the air in that and then you're smelling them, part of the smelling them.

So they've shown that actually the olfactory nerve in your nose like directly connects to your brain and there's some cool studies kind of cool I guess showing that compounds can travel through the olfactory nerve directly into the brain. And then of course you're breathing that stuff into your lungs and that can get right into your blood that way. Then stuff that other stuff that goes in your mouth, right, so water or other beverages that you're drinking. Any food that you're eating, right, so and then of course like everything goes out from there. So it's what you breathe, what you put on your skin, what you breathe, what you drink and what you eat are the most common exposures the way stuffs gets into people.

Robb Wolf: Right.

Tim Gerstmar: Right. So yeah, you look at plastics, right? So can we make it better or worse? So yeah, there's something called bisphenol-a, which has been if you look at like water bottles and stuff now, you'll see they very proudly proclaimed, no bisphenol-a in this thing, right?

And what bisphenol-a or all the bisphenols do, is they soften up plastics. So if you have a plastic without of bisphenol in it, it'll be like really hard like you couldn't squish it, you couldn't squeeze it like if you'll just crack it because it would be hard. So they put these compounds in there so they can make softer, squeezable things, right. So any kind of plastic that especially has flex to it is going to have these bisphenols in them.

So largely what they did when we found out bisphenol-a is a xenoestrogen, it seems to be carcinogenic which means it can cause cancer and other health issues, autoimmunity is another one, right? They switch to another bisphenol-a called bisphenol-s. Well, a new study that just came out said actually bisphenol-s might be even worse than bisphenol-a and they're saying the entire family of bisphenol chemicals has a very similar shape and structure so it's likely that the entire line, is problematic, right? Which just sucks because you're like, dammit, where is plastic? Plastic is in almost everything.

Robb Wolf: Right.

Tim Gerstmar: So then you think with glass and it's like, okay well, glass is great, obviously, it doesn't do anything. I mean and from your biochem days, right or…

Robb Wolf: Incredibly inert.

Tim Gerstmar: Right. It doesn't do anything but the problem is you can break it, right? So I don't know. I don't necessarily know you. I don't want my 6-year old with a big glass of bottle because chances are probably break it somewhere. So what do you do about this stuff and?

Robb Wolf: Yeah, so you're weighing on the one hand possible exposure to xenoestrogens or a trip to the E.R. because the kid dropped this glass jar and it shatters and they step on it or something.

Tim Gerstmar: Right. I mean, not to be all -- well I know some of them are cool now. I've seen rubber like…

Robb Wolf: Right rubber coated one**s.**

**[0:30:04]**

Tim Gerstmar: And great, smart idea. Please, someone out there listening in Robb's audience, come up with a great glass line like drinking bottle that like my kids can get to and that they won't break all over the place, right? Please.

But when it comes to a lot of this stuff, it is really is weighing pros and cons, right. Because what I tell people is unfortunately there's no place on earth, literally, no place like top of Mt. Everest, you can go there, top of the Arctic Circle or bottom to the Antarctic, there's nowhere you can go unfortunately that the stuff isn't there, right?

Robb Wolf: Right.

Tim Gerstmar: That's just what we've done. A new, again, a new study came out showing, hey, guess what China burns coal. All the particulates, all the mercury that's in coal and everything gets sent up into the sky, blows over and then dumps in the mountains here in the U.S. So they're seeing a lot of toxicity in some of the lakes and streams here that they're tracing directly back to the Chinese mainland, right?

Robb Wolf: Wow.

Tim Gerstmar: Which is just like, damn it all. What am I supposed to do about that?

Robb Wolf: Right.

Tim Gerstmar: But the point we want to make is this topic can feel so overwhelming. The reality is there are some very reasonable things that people can do. If you're in pretty good health like there are some reasonable steps, right? So they did a study -- I believe it was in Danish kids, and all they did, they took their urine and blood and they measured for samples of some of these toxic compounds. They put them on in all organic diet for a week, 7 days, then they retested them after 7 days and they found a 90% drop in these compounds coming out of these kids after a week.

So it is like reasonable things that hopefully a lot of people that are listening to this are already doing. Like, again, as much as you possibly can source your animal products and your plant products from reputable people, buy organic as much as you reasonably can or at least the dirty dozen, right, that the biggest most problematic fruits and vegetables like stay away from those. You can go to Environmental Working Group that's ewg.org and look that up. They keep pretty good look at that.

So and then I can go on and on, Robb. Where you want to take this thing? But there's some simple steps that most people can take that go a long way to helping. And then there's a lot of stuff like just you talked about for reforming agriculture and reforming a lot of our systems. Like as an individual, there's very little you can personally do but as a collective, when each of us take a little bit of action, there is a tremendous amount of stuff that we can get done.

Robb Wolf: Yeah, yeah. So we're gearing up for house remodel. We've moved on to little farm and the house was built in 1964 and most of the updates that occurred in it happened about 1972 so it's pretty dated but…

Tim Gerstmar: Right, right.

Robb Wolf: Some of the things that we're doing were opting for a wood grained tile instead of carpet because the carpet, even the best of tenths that it's kind of -- if it's really natural fibers, then it gets weathered rather quickly. We're also opting for adhesive for the tile which takes longer to cure but it appears to have much lower volatile organic compounds released. So it's a little more expensive because it takes the tile installers a little bit longer to do it because it doesn't have this epoxide process that really speeds the things along quite as quickly but there's a few trade-offs on that.

I'm trying to think of what else we do around here. We do use some plastic bottles which I still go back and forth on. I do need to -- both girls are getting old enough now where I think one of those rubber-wrapped or silicon-wrapped drinking bottles can be an option. Those are the biggies.

And then part of the reason why we moved out here is to start growing a significant chunk of our own food, canning, preserving, doing fermented foods with the stuff that we produced even before we're in a position to do that. I made my own sauerkraut from vegetables that I got from the supermarket and that always seem to do both girls really well. Both of them eat kimchi which I'm excited about because you mentioned the degradation of BPAs. So that's fantastic. What other rocks have I not looked under there as far as taking care of my family?

Tim Gerstmar: Well, look, I mean you've done a smart thing in terms of like you tested your -- first of all kudos to you. I want to put it out there to the audience like, maybe you can't do what Robb can do and maybe can't move out and get a place in the country or whatever but there are sensible steps you can take. But look Robb said, his water is tested. I just want to put a plug out there like I just I saw a study -- not a study, a news report broke last week saying -- I can't remember where, somewhere in Massachusetts, right. They found high levels of lead in their water.

**[0:35:27]**

And it's like, look if your house was or your neighborhood or the place where you live was built like between about 1880 and kind of 1930, 1940, you should be pretty wary of like what's in those pipes, basically. I really recommend, it's like it's not expensive, you grab some of your water just out of your tap, right. There's a lot of companies to send it in. Like testing for lead is super easy.

But talking about something that screws up kids like if lead gets in there, it causes neurodevelopmental so brain development changes. It seemed

to be permanent. Like you chelate or gets this lead out of kids, it helps but it doesn't seem to reverse some of the damage. So it's like look, if you're in an older place, it makes sense to test your water. It doesn't have to be expensive. You don't have to buy like $10,000 super duper water purifier but on the other hand it's a little, I know can I brand names on this Robb?

Robb Wolf: Okay, go at it, yeah.

Tim Gerstmar: All right yeah, like a pure water filters, right. So this little dinky guys that people get, like don't honestly do very much. It's a little bit of charcoal in a little canister and maybe it helps a little. But I recommend people for 100, 200 bucks that if you just don't know or you just want to be a little safe like pick up a good water filter and get that thing on your sink for your water. Just do yourself a favor and change the damn filter once in while. Like you can get people, yeah, I bought a water filter like five years ago and they've never changed the filter and it's like, yeah it is probably not going to work anymore.

Robb Wolf: Right, right.

Tim Gerstmar: Then so that's likely like water, what they're drinking. You think of air again so the country can be both good and bad. Like if you're around a lot of farms, probably, especially more conventional farms like probably not so good.

Robb Wolf: Right.

Tim Gerstmar: But if you're around more forest or organic kind of agricultural or something like that then superb. And then you talk about it like when you're looking to the extent you guys can when you're looking at, either remodeling or building, it's like try and choose the things. There's like low VOC paint. VOC means volatile organic compounds. That's the smell that comes off this stuff. If you walk into a room and you can really smell it like when you put a new carpet in or if you guys a new bed like get in and it just smells like really intensely like get that bad out in the garage and let it air out until you can't smell it anymore. You've released gone aways in doing that, in you're reducing air exposure.

Robb Wolf: Right, right because when that stuff is fresh off the pallet that's what it's outgassing the most and then that really drops off rather quickly with the time.

Tim Gerstmar: Right, right, I mean you still get a little with glass. But it's interesting because all kid -- all traditionally manufactured kids clothes were doused in flame retardants. Until just recently because oh my god your kid make -- and I don't want to like to make light of this but like your kid may catch on fire and so we need to make their pajamas and everything else like flame retardant. The only problem is those flame retardants are bromine compounds. Like bromine it has been shown to interfere with thyroid function. It's been shown to cause other problems and a lot of the testimony that was put forward for all of that, it was fraudulent, right.

You just have California which kind of drives a lot of this stuff just come out and they just, I guess removed the law that said like all beds, especially all kids beds, most of the kids' clothes and all this stuff has to be doused in this stuff because before it was like, well, if you don't want your kids to get exposed, you got to go to a little specialty manufacture who makes the clothes themselves and opts out of doing this stuff.

Robb Wolf: Right, right.

Tim Gerstmar: Okay so to the extent, you can and it's like anything that has that smell is going to be an issue then like you said Robb. So looking at the personal care products you and your kids use, right. I mean, I'm sure you're smart about this but if you're lathering up your kids with a bunch of stuff that has strong scents on it. So there's something in a lot of these personal care products called parabens and so those are xenoestrogens as well and you're like, damn.

So you get that quote like most natural least amount of stuff in it that you can and depending on where people want to go with this, a lot of both cleaning stuff and personal care stuff, if you're feeling a little handy or you want to take a little time, you can whip up like halfway decent replacements for a lot of this stuff with the few simple ingredients. If you don't want to do that, again, it's seeking out and finding some of the better retailers and stuff who are putting out better staff.

**[0:40:31]**

Robb Wolf: The main topical skin thing that the kids get is coconut oil after their baths. We lather them down in coconut oil and it's interesting, we only use shampoo on the girls. This is going to be probably end up on the interwebs and then when the girls are like 18, their friends are going to like, you are dirty hippies. But we really only wash their hair maybe like once a week. They get bathed more frequently but we're not using shampoo except maybe once a week and it's pretty -- I forgot what the brand is but it's pretty rudimentary stuff. It's not quite made out of a lye but…

Tim Gerstmar: You're quite right.

Robb Wolf: It's just a step above that and I think the main fragrance is like some lavender oil or something like that. So it seems to be pretty benign. But even that we kind of wait until they're a little bit on the ripe side and then you really gussy them up and get them cleaned up well and so far so good. They seem to be doing pretty well with that.

Tim Gerstmar: Well, it's interesting, right, because if there is -- people of -- most people now at least those people listening to people like you and me have heard of the gut microbiome. But of course we have, basically, every single part of us is covered in bacteria so we have a skin microbiome as well, right. And what we're finding is that when you use soaps and things like that, you change or you put stuff on your skin, you change your skin microbiome. So for people with people eczemas and psoriasis and rashes and all these other skin-mediated conditions, right, and we don't know the answer to this. But how much does this skin microbiome and what people are doing. So especially not to pick on women but they're constantly putting stuff on or taking stuff off of their skin in the average woman is and how much microbiome disruption is that causing.

Robb Wolf: Right.

Tim Gerstmar: Right and the guys over at, oh mea, AObiome, I think they have like mother dirt now and they were doing some work there on the skin microbiome and some people are getting some really interesting results from essentially like skin probiotics and putting stuff back on to the skin and everything. It's fascinating and yeah, I mean, just like we're saying, hey, stop putting antibiotics and hand sanitizer on all the time because triclosan which is one of those compounds that's in a lot of those skin sanitizers and everything that stuff is pretty nasty too.

Robb Wolf: Right.

Tim Gerstmar: And so, yeah it's like look, most people find if they shampoo their hair a little bit less like suddenly all their dry, dry hair, dry scalp issues tend to get better, right, skin is softer. They don't need to moisturize as much.

Robb Wolf: In my undergrad, I worked at a health food store and people would come in, they're like, I have dry scalp which shampoo should I use. I was like, actually, what you need to do is go over to the meat department and get some grass fed meat and here's some coconut oil and some fish oil and eventually they are like, yeah, you were destroying our body sales. You

need to cut this out so it's kind of funny but people would come back and they are like, my hair looks amazing and my skin is clear for the first time and I don't use soap anymore and I'm just like awesome. I've made another hippy that's fantastic.

Tim Gerstmar: Yeah, absolutely, I mean, look we talk about mismatches, right, a lot of the ancestral health movement and I know you've beaten this thing to death. We talked about food mismatches and exercise mismatches and sleep and stress and social like a community and social connection mismatches. But the thing is like we were never evolved with the load of chemicals that we are putting on and into our system that we have now.

I mean you just kind of go through your day and you think everything from like we've been talking personal care products and toothpastes and then you go down to your fridge and you open the door and then maybe you get that new fridge smell. And you're on carpet or you're on paint or you're on linoleum and then you've eaten all your foods out of plastics and let me just say like, I still use some plastics too and part of it is just kind of convenience. Look, you pick your bottles and you only have so much in a day that you can tackle kind of thing, right?

**[0:45:03]**

The worst is when you put hot into plastic and so look if you're going to use plastics, we recommend you try and pick the harder ones, the polybicarbonates -- and am I killing that, the polycarbonates and the harder ones. So again less of that plasticizer that's in it that those bisphenols and other compounds, right. You try and put things that are room temperature that are cold into them because the heat leaches stuff out and it's sort of like, hey if you're going to microwave or you're going to heat stuff up, don't do it in plastic. If you're going to put, coffee or tea or something else that's hot into something ceramic or glass or stainless steel, right, not into plastic kind of stuff.

And so, if you're going to use plastic, like cool just like your food or your beverage or whatever to cool down before you put it into the plastic. And as much as you reasonably can try and get over that glass or stainless steel or ceramic or something like that that's not going to leach. Leach compound is into it.

Robb Wolf: I'm just waiting for somebody to do scalding hot bulletproof coffee in a styrofoam cup and the coffee actually dissolves the cup. And they're like, hey, what happens with that and it's like chemistry happen with that. But that's what happened.

Tim Gerstmar: Nice. You know Robb there was a vendor who used to go around and this maybe too nerdy but there's a couple different forms of fish oil and others. The triglyceride form which is sort of how naturally occurring fish oil happens but then in the refining and processing, you can turn it into the ester form. They used to do a fun trial where if you put that ester form into a styrofoam cup, it will actually dissolve the styrofoam cup. So you can just watch the cup come apart and it was part of their sales pitch but it was just fun to watch a disintegrating styrofoam cup.

Robb Wolf: Oh yeah that's always fun, because the stuff doesn't go away so you got to figure out some way to get rid of it so I guess your bulletproof coffee or fish oil esters are the..

Tim Gerstmar: Why you don't -- there you go. Well, the exciting thing is look, I mean on some level we're going like what do we got to do with the stuff? The good news in all this microbiome and bacteria is that the reality is bacteria probably going to figure out, right? I mean I don't have a study for this but I remember hearing somewhere that even in some of the literally radioactive toxic waste dumps and stuff, they were finding bacteria growing on in some of the stuff that degrading some of these nuclear radioactive compounds and stuff. So with bacteria maybe they'll just kill us all without antibiotics or whatever, they'll probably eventually clean up this place too.

Robb Wolf: Right, yeah, when people talk about saving the planet, I'm, no, we're really talking about saving ourselves. This planet is still going to be here and maybe a mess but it will still be there.

Tim Gerstmar: Right, do you want to talk a little bit about obesogens in particular?

Robb Wolf: Yeah, yeah let's jump into that.

Tim Gerstmar: So relatively new term, like gen, means, to create, right? So people have heard like carcinogen like something that creates cancer or stimulates cancer. Well obesogen, right, I think you got that like stimulates or creates obesity, right. So we have these endo whether -- they're called endocrine disrupting chemicals. So we've been talking about xenoestrogens. That's one endocrine disruption, in other words, endocrine means like hormones, right, so you got all the -- estrogen is one hormone that all of us have, thyroid hormone, growth hormone, all these other hormones, right. So endocrine disrupting chemicals are all these compounds that mess up your hormones, right.

So I gave a talk and I think it was 2013 Ancestral Health Symposium talked a lot about thyroid disrupting chemicals so I know kind of a hot topic in the past, right? Hashimoto's and autoimmunity and yeah, yeah, that's all totally true but a lot of these chemicals also interfere. I showed them in this presentation how you go from the hypothalamus which is in the brain all the way down to the thyroid receptors and the nuclear receptors where the thyroid hormone acts and you can see it every single step of the way.

Some of these chemicals can interfere with these compounds and it -- I'm sorry if I'm going off on a change here Robb but there was a study done on the birds of prey, the larger birds around the great lakes area. They found that almost all these birds had goiters because everything was bioaccumulating up the chain from the junk they dump into the rivers through the algae, to the small fish, to the big fish, and then these, higher level predators were eating this compounds. They were getting all these thyroid disrupting chemicals into their systems and then they were getting goiters as a consequence of that which is you crazy effects.

Robb Wolf: Was it fascinating? Yeah

**[0:50:00]**

Tim Gerstmar: Yeah, it's not just us, right. So again, people will say these steps all junk right, well what happened? Like what's happening to all our frogs and amphibians and everything else? They're getting hammered by all this crap that we're putting in the water basically. We're finding that you're getting frogs born with both male and female genitalia or the populations are getting all messed up and everything because we were there rather sensitive and we're putting all the stuff in there.

So all these endocrine disrupting chemicals so then the -- a few years ago somebody coined the termed obesogens. So some of these compounds specifically go in and act in on the pathways that influence blood sugar regulation, what's called, in fact tissues also called adipose so like adipose tissue differentiation in a way adipose tissue acts and everything. Some of these compounds act there.

So these things are specifically called obesogens and that kind of piqued my interest because I'm a guy who -- I've dealt with weight issues since I was a little kid, right. It's kind of like why do some people go through their lives and really never deal with issues with being overweight and why do others like pretty much right off the get go they come out of the womb and they're dealing with overweight and obesity.

Right and there's probably lots of reasons -- don't get me wrong but one of them is these obesogens. So again sort of we were getting into like what your parents and grandparents do and what some studies have shown is that these -- when a baby is developing in the womb, there are some of these really sensitive periods when stuff is being formed and developed and you mess with something right then and the consequences can be just disastrous, right? And you're seeing these obesogens in particular seemed to have a critical effect right there.

So people who probably heard of stem cells, which are cells that can -- they're kind of undifferentiated meaning that they got a lot of potential. They can go a lot of different ways and they can turn into a lot of different tissue. We've come more and more to know now that all of us from kids onwards have these stem cells that can go in and replace tissues, right. There's this cell line and the tissues that these cells can either become basically bone, cartilage which is like the connective tissue that sticks everything together or fat cells. We know that these chemicals can bias this thing, to push this cells into turning into fat instead of turning into something else. So they've shown that instead of becoming bone, these cells turn and become fat instead.

Robb Wolf: And these adipocytes are not metabolically inactive. They almost act like an organism unto themselves and they actually create a metabolic environment that helps their growth in perpetuation.

Tim Gerstmar: Oh, absolutely. I mean the cool thing right to me is we have -- if you go and you take an anatomy and physiology course, you're going to see the bodies chopped up into all these different pieces. We have the endocrine system and these are like things like your thyroid gland, your adrenal gland, et cetera et cetera, right that make hormones. But now we're actually -- we start looking around and we go like, you know, what honestly everything is an endocrine tissue, right?

There was a study I saw that said, hey bone, right, most people think of bone, they think of like the skeleton that hangs -- that's hang in there and it's just like it's chalk and everything, right. But bone when it's alive is this incredibly metabolic tissue and they said, one of the like they're calling in an osteo kind, chemical compound released from the bone influences blood sugar regulation.

Right, so we're seeing like every tissue… Fat, we used to think all its just like -- it's like a suitcase, right. You just throw stuff in there and then when you need it, you'll open it back up and you pull it back out like completely wrong way of looking at that adipose tissue.

Robb Wolf: Right.

Tim Gerstmar: And so the thought is... One of the issues and sort of why do people regain weight so easily when they've lost it and one of the answers seems to be well, these adipose tissue cells they shrink down but they hang around. They're signaling that hey, I'm really empty and I'd like to fill myself back up again, right, whether that's through leptin and some of these other compounds. They're just sitting there primed ready and waiting where someone who's never gained that weight in the first place doesn't necessarily have these extra fat cells hanging around and waiting to get filled up.

Robb Wolf: Got you.

Tim Gerstmar: Right and one of the thoughts is that these obesogens increase starting from this very early period. They bias you to have a lot more fat cells than someone who's not been exposed to it. Right and so that you can gain weight a much more easily and lose weight much more difficulty and I don't think that's a word -- in a much more difficult fashion and gain weight back much more easily, right.

**[0:55:19]**

And then it gets like, God, you're like, man, so then it gets even worse because they're saying some of these compounds and looks like they affect pancreatic development. So your pancreas, right, is secretes insulin and glucagon and some of these other hormones that are really critical in managing blood sugar, right. So are you more prone to diabetes and the answer like seems to be yes, if you've had exposure to some of the stuff early on in your life.

Robb Wolf: Which is again, maybe to pull this thing kind of full circle somewhat to when we kick the show off, I have no doubt that many people benefit from improving their gut biome as best they can and then getting toward a spot where they find kind of their carbohydrate tolerance. But I'm just seeing a lot of folks that seem to do better at the lower glycemic load of the spectrum and you know it's just it seems like the cards are stacked in a way that are -- it's kind of pushing us in that direction that let say maybe there's an argument for the normal ancestral life way to be reasonably carbohydrate dense. Some people will kill each other over whether that means it's 30% or 60% of carbohydrates.

But in the reality to your point from a clinical perspective, are the people doing well on these higher carbohydrate levels whether it's kind of paleo carbs or not and there are some people that aren't. You just have to kind

of dial them down to a level where they maintain as healthy a gut as they can. They can be as active as they want to be but we're not giving them type II diabetes and Alzheimer's in the process.

Tim Gerstmar: Right and look I'm completely with you Robb. I mean my experience with my patient load has been most people are doing better on a lower carb approach, not necessarily you know…I know ketogenic has been the rage for a little while and I don't know where that's going, right now. But definitely not everybody needs to go ketogenic but most people do better at least the people who come and see me a little bit broken a little bit hurting, they do better on a lower carb diet. So look, not everybody of course. I mean, for the idealogues out there, it's like dude, get off your horse. Like if it works for you then awesome, right, but human beings I mean we -- all of us we get ourselves into trouble when we change from saying this works for me to therefore this must work for everybody else at that.

Robb Wolf: Right.

Tim Gerstmar: And it's like look, if you try to lower carb diet and you just exactly what Robb said, you tinker with your gut a little bit and you get in the best place possible. You balance out your hormones and make sure your diet, your exercise, your sleep patterns. If you just stressed social support and community around yourself are squared away as best as you can make it, any mental emotional issues that you have. Like you work on those kind of things. Find what works for you. Look if you have high carb if you're doing like -- what was it Denise Minger and the guy who was basically given people table sugar for everyday and curing…

Robb Wolf: Ricky.

Tim Gerstmar: Yeah and that works for you like more power to you. That's spectacular but I'll tell you that most of the people I see a lower carb approach, it is what works for them. To Robb's point like we tried to emulate as much as we can that ancestral pattern but is people who bashed the paleo movement are all about like we don't live in that world anymore. And yeah like we don't live in that world anymore.

Robb Wolf: Right.

Tim Gerstmar: The xenotoxic load, the amount of crap that's coming into our body is something that no generation before us has ever had to deal with, right. So when I talked about detox, and people like roll their eyes and they are

like oh it's stupid, my grandparents never had to do that, well, yeah like your grandparents lived in a different world than we live in now.

Robb Wolf: Right.

Tim Gerstmar: So are there wacky stupid like detox things out there from people who have no clue of what they're talking about, absolutely and it makes me want to like bang my head against something. But when we talk about detox, is there a way to do it sensibly like you reduced the load of stuff that's coming in, that's what we spend most of that you're talking about. Like these common things that a little bit of effort can dramatically reduce the amount of stuff coming into your body.

And then look, at the end of the day if you're eating a high quality nutritious food, you're getting a lot of those cofactors that these systems need to run but once in a while would it hurt you to like bump up the level of some of these plant compounds and nutrients and other things and engage in a little detox work to try and clear your system a little bit? Like, yeah, I didn't want to believe that we had to do that a few years ago but you get deeper, deeper into this stuff. When you see things like, you know, the average young girl now has a higher estrogenic load coming from outside her body then coming inside her body, you start to say damn. Maybe we needed -- we each of us need to do the sensible things that we can to try and mitigate or deal with some of the stuff.

**[1:00:43]**

Robb Wolf: Absolutely, Doc, where can folks track you on the interwebs? I know you have a pretty thriving practice and people are always looking for practitioners that they can work with? Where can they track you down?

Tim Gerstmar: Yeah absolutely, I mean thanks Robb. We work with people, we're lucky enough like I work with people locally so I'm up in Seattle near the Microsoft Wright Redmond but we worked with people as far away as Korea, Australia. So we want there to be more high quality docs out there but if someone wants to look me up, my name -- name is Dr. Tim Gerstmar. That's G-E-R-S-T-M-A-R so you can just Google that. My website is aspire, A-S-P-I-R-E naturalhealth.com or you can grab us on Facebook. I post quite a bit of stuff up there too so.

Robb Wolf: Fantastic we have links to your website or in the show notes and Doc, really great to finally have you on the show. It took a little while to make this thing happen but I'm stoked we finally ticked it off the list.

Tim Gerstmar: Well, I appreciate it man. Robb, I'm glad to be here and you know I'm glad you just bring a little light to this. Like so many people out there

doing such good work. They're working on their diet, they're exercising and it take a great -- you play a great part in informing people a lot there, Robb. They're just some more pieces. Does everyone need to hyperfocus on this stuff? No. But like are there some sensible things that almost all of us can do to reduce our load or maybe help our system get rid of some of these of stuff? Yeah.

And then look again we've vote with our dollars. So hopefully a lot of people out there are using their dollars to buy better quality food from local producers and support these systems that did collectively make our world a better place. So we're just staying on the same line like when you go to buy personal care products. When you go to buy new carpet or paint for your house or anything that involves some of these things, try and vote with your dollars and choose things that are more that it just put less of the stuff out into the environment.

Individually we can't do very much but when we pull together collectively, there's a lot of stuff that each of us can do. So please support with your dollars and then legislatively like when some of these things come out like as much as you can get involved or vote for some of this stuff so we can get some of this crap out of our environment.

Robb Wolf: I cannot advocate for that more. That's awesome. That's fantastic.

Tim Gerstmar: Awesome Robb. Thanks for having me on.

Robb Wolf: Doc great to have you on and look forward to seeing you at a future ancestral health related event. I'm sure our paths will cross soon.

Tim Gerstmar: Awesome, I look forward to it.

Robb Wolf: Okay.

Tim Gerstmar: Thanks Robb.

Robb Wolf: Take care I'll talk to you soon.

**[1:03:22]** **End of Audio**