984: Sulforaphane, Supplement Smarts & the Science of Bioavailability With David Roberts and John Gildea

Child: Welcome to my mommy’s podcast!

Katie: This podcast is brought to you by BIOptimizers and in particular, their product that holds my heart, which is their Magnesium Breakthrough. My goal this year is to continue to focus on my wellness and to create more harmony and resonance, and we all know that the foundation of health is a good night's sleep.

I talk about that so much on this podcast. And magnesium is the one nutrient that helps my sleep so much as well as so many other aspects of my health because magnesium is vital for so many things within the body, and it is nearly impossible to get enough from food anymore. And Magnesium Breakthrough from BIOptimizers is in a category of its own.

They have seven different forms of magnesium in one supplement, and since magnesium is involved in over 600 different biochemical reactions in the body, no other supplement on the market offers all seven types of magnesium in one bottle. Pretty much every function of your body is upgraded when you take magnesium regularly from the quality of your sleep to your brain function, from metabolism to stress levels, and so much more.

This is one of the few supplements that lives on my nightstand and I'm a little odd, but I take every morning because I actually get energy from it though most people notice that it's better at night. Now studies point to a lot of benefits of magnesium, including that it may help improve sleep quality, especially by supporting healthy sleep onset and have more peaceful nights.

Magnesium is also involved in stress management support and it may help maintain energy levels and positive mood while also supporting mental clearness and relaxation. Magnesium is also important for healthy and balanced muscle tone and providing the building blocks to strong bones, and it promotes a balanced stress response, supports relaxation.

And I feel much calmer when I'm regularly taking magnesium. So let's face it, even if your 2025 resolution is not all about focusing on your health like mine is, how are you going to be able to achieve your goals in any area without enough quality sleep and stress management? Check out Magnesium Breakthrough and make it part of your daily routine this year as well.

For better sleep, better stress response, and much more. They have a 365 day money back guarantee and you can find it at Bioptimizers.com/wellnessmama and use the code Wellnessmama for a discount. This episode is brought to you by NativePath and in particular, something I have been experimenting with and really, really loving lately.

And here's what you need to understand. A lot of us think calcium is important for our health, especially for our bones. But is this actually true? Bad news. It turns out maybe not, or at least there's more nuance here.

One of the largest bone health studies ever conducted followed thousands of women taking calcium and oral vitamin D daily, and the results were surprising, but not in the way you would think. They saw no significant reduction in their risk of fractures, and they saw no improved bone density. So all those calcium pills might not be doing what we think, and it turns out they might actually be counterproductive.

But here's where it gets interesting. A brand new study found that women who did one thing every morning consistently for six months gained 7% bone density, which is massive. This is the same amount of bone mass the average person loses over the course of five years after a certain age. So what did they do?

It was not a medication or even a workout. It came down to one simple thing added to their morning routine. And that's why a lot of people, especially people over 50, are making this one simple change and seeing massive results. I'm sure you're probably curious what it is, and it's a particular protein from one of my favorite brands called NativePath.

And they're offering all of you up to 45% off of this, plus free shipping and a free gift. Right now you can visit savewithnativepath.com/wellnessmama to find out what it is and how to implement it and save up to 45%. So again, that special site for 45% off is savewithnativepath.com/wellnessmama And see why people are adding this to the routine with amazing results.

Katie: Hello and welcome to the Wellness Mama podcast. I'm Katie from wellnessmama.com, and I am back today with David Roberts and John Gilia from Mara Labs to talk about sulforaphane, understanding supplements, and the science of bioavailability. And if you have not heard from these guys before, I love learning from them.

John is a Johns Hopkins trained PhD with 60 scientific publications from over 20 NIH funded studies. He is an expert in cell culture exosomes, performing all the science behind the gut supplement you may have heard of called Restore. He was also instrumental in the initial stabilization of sulforaphane in a product called Brocelite, which I take. And David Roberts holds an MPH from Johns Hopkins, a master's in BME from UVA and a bachelor's from Duke.

He has more than 20 years of public health experience on three continents, and he co-founded The Gut Supplement, Restore. And in this episode we go deep on synergy, bioavailability, what to look for in supplements, red flags in supplements, and so much

more. I always learn so much from these two. Let's join them now. David and John, welcome back. Thanks for being here again.

David: It's great to be here Katie. Thanks for having us again

Katie: Well, if you guys missed it, I'm gonna link to our first episode in the show notes. That one was all about salt. I learned a whole lot and definitely have some action steps I will be experimenting with in my own life immediately after that conversation. I have a feeling the same will be true for this conversation because anytime I talk to you guys, I learn so much and I know this conversation will be no exception.

And we're going to dive into the science of supplements, bioavailability, understanding what's actually in our supplements and how to choose good ones. I know this is a big and broad topic. Maybe as some background, we're definitely gonna get into the ones that are good and the ones you guys have created specifically.

But before we get there, can you walk us through maybe some red flags to be aware of when it comes to buying supplements, looking for supplements? Maybe things people might not know to be cautious about.

David: That's a big question. I'll start and then John can jump in. So basically the first thing to keep in mind is what's in the capsule. And so there are fillers typically in the capsule and there are flow agents that are in the capsule. And on the extreme amount, like there was a sleep supplement, it's, I'm not gonna mention it, but it's somebody we both know, Katie. The 60% of the capsule was filler. It was like filled with pea protein and flow agent. And then 40% was the actual molecule that they're selling. And so that brings up so what's in the capsule and what's the amount of the things that you're trying to get?

So this was a sleep supplement, had like 5-HTP, and it just wasn't, it was hardly any. It wasn't enough that was gonna actually move the needle with their suggested serving size. And so you know those are two things is, what's in the supplement, and is the amount that you're getting in your serving size actually going to do anything? What do you think?

John: Yeah, that's a good point. I would guess that the way I look at the supplement industry is that I made the ones that I thought were missing. I still have a bunch more that I wanna make, but to make the connection between cell culture studies and what you should put in your mouth is sort of an entire world on its own. So going from your mouth to the cell you're trying to affect is super important.

And when you look at cell culture studies where you take a product like curcumin and you see this unbelievable effect on NF kappa B, or literally any (cancer), any molecule and signaling pathway you're looking at, curcumin just looks like it should be the best molecule

on earth. But the bioavailability of curcumin is so low. It's unbelievably low. So there's been a bunch of studies that are positive from just taking regular curcumin. So my interpretation of that is that you're affecting just cells that are lining your intestines. And I don't want to boo-hoo that because that's an important part of decreasing inflammation is the cells that are lining your intestine and your colon. So that's important to decrease inflammation in that realm. But if you want to get inflammation reduced anywhere else in your whole body you have to get it past the intestines and in high enough concentration to actually have a therapeutic effect at the cells you're trying to get it to.

So that's that's what we were designing. We knew what concentration that we want to get to at the cell. And that's how we dose our products so that we know that it gets at the concentration that affects basically signaling. And and then we test in a person that it affects that that cell type. So for curcumin, when we developed our product, we knew that we wanted to get to a high enough concentration in order to inhibit IL-6.

It's a very good marker for this. The target of curcumin, which is NF kappa B, the master regulator of inflammation. And so that's how we formulated that product.

Another important aspect of this is that we're looking for synergies. So there's a lot of synergies out there that are sort of very unrecognized. And so if you can't get 50 micromole of curcumin into a cell, it's just not possible right now, how would you do that?

So our strategy is that you combine a couple of other things together that all work in different pathways in order to inhibit NF kappa B. So that is a clear one that we've shown for sulforaphane. Sulforaphane inhibits NF kappa B, curcumin inhibits NF kappa B, quercetin inhibits NF kappa B, but they all do it by different mechanisms and they're synergistic. So even a lower concentration, if you take two of them, are affecting the end pathway in a therapeutic way. And that is sort of how we've designed all our supplements.

And so I probably should talk about the other side is what are things that I won't be formulating and selling from here? And they're all the ones that if you if you just do a mass spec analysis of the product and it has the amount that's in there and that product is at a dose that doesn't have any problem with bioavailability, that product is fine. And there's a large number of supplements out there that you don't have to have a special formulation for just the right dose. And, so I wish there was a list somewhere. Maybe we'll work on that sometime as just a list of supplements that don't have any problem with bioavailability and that you can take that and you can basically assume that you're gonna match the studies using that supplement.

David: Yeah I mean it's... and it and what John's saying is important because the whole idea of... I mean we got into this cause both of our wives had cancer. And basically looking at their cells in our lab, especially my wife Mara. But like, you see like curcumin was number one in killing her type of cancer. There are like dozens of papers on how curcumin is great for cancer, but then how do you know what you take is actually getting to the cells?

And it wasn't. And so coming up with, actually over a lunch conversation, if you remember that. Coming up with a way to get the curcumin attached to something. To get it through the blood or the gut barrie, into the blood, to the cells, so that what you read in those studies actually can happen.

And that's what we've been researching and studying and trying to to make happen. And the whole idea of synergy. So additive, if it's additive it's one plus one equals two. So like it's what you would expect. But a synergistic effect, one plus one equals 5 or 10. And so it's much larger than the individual's effect than the individual's combined. And so what John's saying is you can, by combining these supplements, we're finding that you can get a much larger effect than is possible if you just take one of the compounds. And that's through the, because they're working at different angles.

And he was talking NF kappa B, that's the holy grail of inflammation. It's what a lot of the pharmaceutical companies, that's the target they're aiming for when they're creating an anti-inflammatory. And so the fact that we have some natural compounds that really impact that is huge.

Katie: Yeah, this is such a fascinating concept to me, and I know we hear those terms like bioavailability and synergistic tossed around. But I feel like most people don't have a deep understanding of those or even know how to analyze in the scope of supplements. If what they're taking is gonna have those properties or not, how much they're actually absorbing.

I know some of that feels very ambiguous. And I would love to kinda get each of your perspectives and of course hopefully touch on some of the ones you've gotten to formulate as well. But from your perspective, what are some of the general kind of highest ROI compounds that we can take as humans? I know there's some bio individuality here, but in general, what are some of the highest ROI and or what are some ones to generally avoid or that you would say like, we're not getting a good bang for the buck, or that we're not absorbing most likely?

David: Yeah I mean...

John: I don't know what ROI means.

David: Return on investment.

John: Oh.

David: So basically curcumin has less than 1% bioavailability. And so the blessing and the curse of the supplement industry is it's not regulated. And so people can say things and they, you know you have to be truthful, but like if you're not truthful, then somebody actually has to cough up the money the cash to sue you unless the FCC does. And so everyone, basically everyone says they have the best curcumin on the market. Everybody across the board. You go on Amazon, we have the best curcumin here, and you know because we combine it with black pepper or something like that. And so, but what's the truth?

And so basically the truth is even bioavailable, quote unquote bioavailable curcumin supplements don't get enough curcumin through the gut barrier to make a biological difference. And so and then if you're taking turmeric, you know what John's biological difference, I should say outside of the GI tract. Inside the GI tract it could be great. We did find one curcumin that has, it's 3% curcumin 97% detergent.

And that actually gets through the gut barrier amazingly. But what, how it does it is it just, really the detergent irritates the gut so much that it makes it permeable and the curcumin gets through. And so what ends up happening is that you just get, instead of reducing your inflammation you get a massive spike in the inflammation, which in IL-6, in terms of IL-6.

So yeah, I mean, that's I'd say that's... So but curcumin is lipid soluble, it's fat soluble. Curcumin,resveratrol, quercetin, berberine, EGCG are five things that are lipid soluble. And can you think of anything else? Did I miss any?

John: Yeah there's a bunch of them, I-17.

David: 17? Those five are the ones we used regularly. But basically unless you're attaching it to something to get it through the gut barrier, it's not happening. And so what we're, what the technology we're bringing to the market is, and we're showing, we can prove it, is that it's actually getting these compounds to the cells and making them in a biologically relevant way. So you can impact your biology and feel the difference you know. That's, we have a, that's a big thing is you can can feel a difference pretty quickly even within one serving. Refresh your question so that John can answer it.

Katie: Yeah, just understanding kind of the highest return on investment or most impactful substances and supplements that we can focus on that are sort of generally helpful to humans. Understanding that there's also, of course, personalization and bioindividuality there. As well as ones in general as categories that are maybe a waste of money or that people might buy and not really get a benefit from.

John: Yeah so I think because of our reason for getting interested in supplements we ended up finding out which which ones were the most effective at the cell through our screening. Because we put on a couple hundred natural compounds onto these cells to to see which ones actually affect pathways the best. And when you run into the fact that they're super effective, but not bioavailable, we call that the lowest hanging fruit in the supplement industry. Is that you have a supplement that's already proved in thousands and thousands of papers to function in the correct way.

Everyone knows that inflammation is driving aging and and chronic disease. But if you're not getting any into the, past the gut barrier, you're missing out on the vast majority of cells in your body. And so that would be super low hanging fruit, curcumin. Sort of inside from a researcher's mind that reads lots and lots of papers. So when I read the curcumin literature there's many papers out there comparing all the different curcumins. So me being a bench scientist person that actually does the testing, I feel like I'm useless unless I'm actually doing experiments with my hands.

When I read those papers I see a a glaring problem in the research. And the glaring problem is nobody studies curcumin. They don't measure curcumin. The prevailing way all of those studies are measured is you take a curcumin product, you extract blood and then you have to rip off the, in the case of curcumin the glucoronidation and sulfation that happens to curcumin when it goes through the liver.

And the problem is those two forms of curcumin have no activity. So why are we measuring the amount of sulfated and glucoronidation curcumin in the blood if that has no function? So we measure curcumin and it's just the bottom line. If you can't get curcumin into the blood and without messing up the barrier that you are getting it through, I think you'd be better off just taking regular curcumin that's not absorbed.

David: Yeah. And so like just to to answer answer the ROI. What's a supplement that to give you your biggest bang for the buck? I mean one thing you can think about is what's a supplement that does a lot of different things at once? And so the one that comes to mind, I mean probably cause we make it and sell it, but because we research it also, is sulforaphane has 37 I think or is it 39? 39 different pro-health mechanisms in the literature. 2000 papers, a lot of them from Johns Hopkins, the molecule was discovered at Johns Hopkins.

But like, but that's a lot. And I'm not sure... And and they're not just little things, they're huge things. And so anyway, that would be one biggest bang for the buck. And I know because of the synergistic, again there's that word, way they work together is curcumin and sulforaphane together do amazing things. And so that would be a one suggestion.

Sorry, they're my, our products.

John: I have one that I can probably plug that I tell a lot of people to take. It's because one of my nutrition heroes sort of wrote the first paper and that's Bruce Ames. Yeah. Ames is the most referenced researcher in history as far as I I know. At least that was a short time ago. And he's the person that discovered carcinogenicity. So the AMES assay is how you you determine if something's a carcinogen.

Well it's amazing that he did the original study that's so referenced, but then through the rest of his career he came up with this idea that it's nutrient deficiencies that are actually driving chronic disease and not actually toxins or carcinogens that he's famous for. So when a person is that influential, I think most people now agree that it's both toxins and nutrient deficiencies that are driving chronic disease. He came up with a supplement mixture that I think works in a huge number of people and there's no problem with bioavailability.

And this is a particular nervous system supplement. The combination of lipoic acid, alpha lipoic acid, with acetyl L carnitine. So he showed in animals that it reduced the cognitive age of old rats by half. They started performing like rats that were half their age. And so it's just a one two punch of getting carnitine inside cells and lipoic acid which is a co- factor for oxidative metabolism. People would be, it would be really good for them to listen to this guy cause he has a lot to say.

And he discovered what's called a quarry bar. Quarry Bar has all of the micronutrients and minerals that he found were deficient in population. So he wanted he made this thing called a quarry bar, did a number of studies for it to to plug up all the holes that he found in nutrient deficiencies.

David: Yeah along those lines: Liver, cow liver. If you can take those as supplements or you can take those as just a diet, you know in your diet. I like to grind up and so what that does is it's that liver is the most nutrient dense food we can get. So you're getting a lot of the... if you're wanting to make sure you're not nutrient deficient, that's a way to do it. And so we use, we both buy cows and have cow livers and you can just grate it into, like keep it frozen, grate it into ground beef. You do about 10% We both have children. If you have about 10% of your ground beef as liver you can't taste the difference, especially if you spice it.

If you give, you know start approaching more than that, then they can tell and then they don't like it. But we also use Pluck which is a spice, but it also has a freeze dried organs. I use Adapt Naturals. We don't sell it. That brand, it's Chris Kresser's brand. And they have a

organ as well as a multivitamin. So there's ways to make sure you're not nutrient deficient, Those are some.

Katie: So many good tips in that one response. And, you mentioned sulforaphane, and I would love to go deeper on this because I've written about this in the past, including how you can grow your own broccoli sprouts. And I was originally introduced to this through Rhonda Patrick. And at the time my understanding was pretty much the only way to get it in a bioavailable form was to grow your own broccoli sprouts.

And there were all these things you could do to make them more bioavailable and so forth. However, when I met you guys, I found out there, actually you guys are the only ones who have created a stabilized form of this for people like me who no longer want to make broccoli sprouts three times a week.

But I feel like Sulforaphane is still like a less known supplement for how beneficial and powerful it is. So I would love to go a little deeper on the science of sulforaphane. What makes it so powerful and so hard to measure? As well as like what you guys did differently to stabilize the sulforaphane along with the cousin molecules that make it so effective.

David: Yeah so, excuse me. When Rhonda Patrick was putting that out there I think that was true. You could only grow broccoli sprouts to basically get sulforaphane.

And I think there's a company in, or there is a company in France, that has a stabilized sulforaphane. They extract through kind of chemical solvents. We do it through water. And so it's, you don't have the same residues and so we think ours is better. We know ours is better. But anyway, it's a French product so it's a little hard to get here anyway.

But basically sulforaphane, again was discovered in 1992 up at Johns Hopkins. They did all, much of the research. They actually had a center called the Chemoprotective center where they would, actually it was centered around for a long time growing broccoli sprouts and disseminating the broccoli sprout liquids that were measured and standardized to researchers so they could do studies not just at Hopkins but other places.

Since then they stopped growing those. I think Jud Fahe left Hopkins, but basically they spearheaded the research. And so what we did was basically what I think, Mara and I was we were growing enough broccoli sprouts for like 10 families. And you miss a... you know in the summers they get moldy or there are fruit flies, or if you have to travel, you miss a batch.

And so anyway, I just, we were having lunch, I'm like you know it would be nice if this was in a capsule. And so I think a couple years later we're having lunch again, he's like, kind of matter of fact, but yeah I think I stabilized sulforaphane. And so the issue is it's not stable. So if you actually, God bless you, if you actually grow the broccoli sprouts and juice them

and try to extract the sulforaphane, it degrades. And it degrades quickly within days, you know hours to days. And so it's not shelf stable.

And what John did was he figured out how to stabilize it and and make it shelf stable. So basically why that's important is because of all the things it does. And the three main things we talk about are inflammation. It's potently anti-inflammatory. And brain health. It produces a molecule called a brain derived nootropic factor BDNF which is at the center of brain health. So that molecule protects existing neurons, but it also helps grow new neurons which we didn't think was possible even a few years ago or about a decade ago I guess.

And then also detox. So detox is big. It's big on social media. Everyone wants to do a detox. But there are three phases to detox. Sulforaphane works in all three phases, but it's the best natural molecule at phase two detoxification. And so part of that and the other side of that is and that detox phase 2 detox goes through something called the NRF-2 pathway and which does a lot. That pathway is also responsible for turning on 200 different antioxidant genes that can produce 200 different antioxidants called the Antioxidant Response System.

And so that stays on for 72 hours. So if you think of vitamin C that's an antioxidant right, but one vitamin C molecule can negate one pro-oxidant and and so and then it's done. Whereas with sulforaphane it just keeps pumping out. Once that gene's turned on it stays on for up to 72 hours and it keeps pumping out these antioxidants. And so it's in some ways sort of the master antioxidant and because of how it can pump out so many antioxidants.

So yeah I mean there are more ways that sulforaphane as far as benefits and how it works, but those are the three main things we talk about. And we've talked a lot about bioavailability. So sulforaphane has no problem with being bioavailable and so it gets through your gut barrier and gets to the cells. That the historic issue has been that it's not stable. And so but if you go on Amazon everybody has sulforaphane, but they actually don’t. They advertise, it's like the wild west. They advertise they say you know 50 milligrams of sulforaphane, but it it actually has none. You turn it over and look at the supplement facts, it has the molecule that comes before sulforaphane called glucoraphanin or sulforaphane glucosinolate, those are, that's the precursor.

So you have a head of broccoli, it has glucoraphanin the precursor in it. You start chewing it, it breaks the cell wall which has this enzyme called myrosinase that is released from the cell wall. It interacts with the glucoraphanin to make sulforaphane. You swallow it you get a benefit. But again, if you try to harness that sulforaphane, historically it degrades. And so what we bring to the market is sulforaphane in the capsule which is important because if

you're just taking a capsule of glucoraphanin you may get some sulforaphane benefit, you may not. It's just, it's a crap shoot.

And so with with our supplement, you know what you're getting. And when we made it actually this was eight years ago now. We were making it and we were noticing it was like for all of us it was working so quickly. We were like, well how quickly does this stuff work? And so we did our internal study, friends and family, coworkers, just to kind of do it quickly where basically we took 10 milligrams of our Brocelite and we did a kind of before and after. And we saw that basically that one dose 10 milligrams reduced this IL-6 about 30% in 24 hours. And so that's enough that that kind of explained why we were all feeling it so quickly. So it works quickly.

Katie: That's amazing. And I'll link to that in the show notes so people can read more about it. I know you have educational resources available as well. And I'll also link to my blog post where I went really deep on sulforaphane when I first learned about it and was so excited about it. I know we're getting to the end of our time and I could talk to you guys all day long, but before we wrap up, I really wanna also dive into something called GL Perfect.

Which I know like GLP-1s have gotten their, you know, moment of fame right now. I feel like they're being talked about so widely and they tend to also have some downsides that maybe are not talked about as much. And it seems like you guys have developed something that might be a safer and potentially very effective alternative for people especially who don't wanna go the injectable peptide route.

And that includes some things I personally love, including EGCG and ALA, which I've taken for years. But can you explain the GL Perfect supplement and what you guys put in there from a bioavailability and synergy perspective to make it so effective?

David: First and then you can jump in. So basically we wanted to do... so the with the background like you said, we would say the GLP-1 peptides are potentially more infamous than famous, because there are some downsides, right? There's muscle wasting, which you don't want necessarily as we age. We want more muscle not less. A lot of the weight loss is, there's certainly fat loss which is great, but there's muscle loss as well, which is not so good.

Muscle being your glucose sink. And so that's important, but also it's pricey. People, what happens when people come off of it, and we realizing you know I think we for years we're like, we're not doing a, we're not gonna... because you think of weight loss products as sort of sleazy people trying to sell you something and they don't really work. Right? And so we're for years we're like, we're not doing a weight loss supplement. But just we saw there's a big

problem and we're on the cusp. We're on the beginning side of seeing a problem of people coming off of these GLP-1s and what do they do? Do they want to gain weight again et cetera? So we're like, well let's at least talk about it. So we talked about it and we looked at EGCG. Some studies says it does nothing, some studies say it actually does work with weight loss.

There's one study in 2016 I believe where they had 115 women and they showed that it actually, EGCG green tea from green tea actually significantly impacted women's weight, their BMI body mass index as well as their cholesterol 5% decreasing cholesterol, all good things. There's one, thinking about a mechanism. There's one study showing EGCG decreasing the hunger hormone called ghrelin 40% in this mouse study. And so we're like let's try that.

And so John worked on basically a study of attaching EGCG to our patent pending protein that basically gets it through the gut barrier. We're like let's see how much more of this EGCG gets through than just regular green tea. And what we found was on a conservative side 200, 225 times more EGCG gets through your gut barrier with our patent pending when we attach it to this molecule. And so that's a that's a big thing.

And so actually when we started taking, doing sort of the initial taking ourselves, taking this product ourselves, none of us were hungry. We're like holy smokes. Like it totally decreased the ghrelin. And so that was like okay, this is actually a real thing. Berberine and lipoic acid are also really really good at decreasing blood glucose spikes. That's important for a lot of different ways, I'll let John get into. But basically, and it works really well. We again, we attach the berberine to this protein that we're patenting. It's a protein and that we attach a c based carbohydrate to and that's sort of the magic.

But you know we both have glucose monitors and we were taking it ourselves and our blood glucose was dropping a lot. Like mine was, I try to keep it under a hundred and it was surprisingly 115 one day. I took three, two and a half hours later I had it was 70, which is like whoa. And so that's actually maybe a little bit too much. But it's also good to get your blood glucose low if you're keto adapted. But yeah John I'll let you give some of the benefits of the blood glucose spike angle.

John: Yeah, I think a lot of people don't realize that the harm that happens from just glucose being high in your blood just in general. So that you eat a meal that has insulin inducing abilities and the spike in blood glucose. Well what happens is the insulin, that's what it does is it makes you absorb the glucose that's in the circulation. So that high glucose driven by insulin getting into the cell is the driving force between advanced glycation end products. And basically your lipids, your proteins are altered so that they're not functioning

well. And so every protein, every enzyme, every lipid in the cell is harmed and it's very hard to reverse. And so trying to not have a spike in insulin and not have a spike in glucose is super important for just anybody trying to get healthy in any way. And so everyone knows the hemoglobin A1C is the measurement for diabetics and that's basically that pathway that I was just describing. So if you can, if you can reduce that effect, you'll put everybody in the right trajectory towards health.

And so that was one of the big things for all three of those molecules are known to decrease glucose. And then of course I have to plug the other supplement is curcumin. So curcumin decreases insulin better than any other natural compounds. So if you wanted to supercharge your GLP-1, which decreases ghrelin, induces GLP-1. If you combine that with curcumin, curcumin is the best molecule in many studies, even meta-analysis, for reducing circulating insulin.

And probably everybody knows that the amount of insulin in your body is the best predictor of longevity. Every study in animals where you reduce the amount of insulin, they live longer. Every study where insulin is higher, you live less long.

David: And that's the issue with GLP-1 peptides right?

John: Yeah. So the molecules themselves they are GLP-1 agonists so they aren't GLP-1. They go to the receptor and turn it on and get these effects. They're very strong effects too. And one of the ways that it will make you lose weight in a way that ours won't is it decreases stomach emptying.

So you get, you slow down digestion so it's stays in your stomach and stays in your small intestines for longer. And so that can be a sense of satiety. So that's a mechanism but it's not great to just have your food churning in your stomach for long periods of time. You know that's actually, if it happens outside of taking this GLP-1 agonist that's a bad finding is to have low stomach emptying.

David: And do the GLP-1 agonist don't they increase insulin? Blood insulin?

John: I can't remember if it's what they do with insulin. I'd have to look into that but for sure the, you want both glucose low you're... it makes losing weight easier if you decrease ghrelin which is the hunger hormone and then you also lower insulin. So I think that those are things to consider for longevity and general health.

David: And Lipoic acid talked a little bit about it, it's just a, like I say it's the best molecule supplement nobody talks about. We talk about it though and so that's why, because it does so well with mitigating blood glucose spikes we included that. And it does it in a different way than berberine. We included that into the GLP Perfect. So yeah, it's we've gotten some

great reviews from it. It's not, like John said the those like some of the GLP-1s are super potent. It's when, that's not, we don't have that. But it's a natural, it does work and so we just suggest people give it a try cause we have a unconditional money back guarantee. It's if it doesn't work it's fine, we'll refund you. So, so yeah.

John: I would say one piece of information's probably unknown, that I'm really super excited about, is if you can get berberine past the intestinal barrier which putting it onto our proprietary carrier does, you can get the molecule inside cells. Berberine is actually this gene called cmic inhibited. And that would be different than even the other molecules for weight loss. And it's, cmic is a transcription factor that regulates glucose metabolism once it's inside the cell. Cmic turns on all the glycolytic enzymes for basically fermentation.

So when you don't have enough oxygen you'll switch over to running off of glucose in a fermentation like manner. And so Cmic can actually block that pathway that's generally not good. So that would be something that's different than a GLP-1 agonist and would be beneficial for lots of different things inhibiting cmic.

Katie: Amazing. Well, I feel like I learned so much from you guys. Every time we chat I'll make sure I link to everything you guys have mentioned in the show notes so people can keep learning and go deeper and get the products. These are ones I take regularly and have definitely felt a difference from. And for today's episode, I hope we get to do more in the future.

But for today, I'm so deeply grateful for your time, for all that you've shared and for how much I've learned today. Thank you both so much for being here.

David: Katie thanks so much for having us and as always thank you for your very good questions.

John: Yeah I had a great time. Thank you.

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