



Episode 477: Dr Steve Morris on Glutathione,  
Free Radicals, Antioxidants and Aging

Child: Welcome to my Mommy's podcast.

This podcast is brought to you by Beekeeper's Naturals, my source for B.Powered products. I loved bees and the many benefits of all their amazing compounds since learning how to keep bees and be a beekeeper as a kid. And I was so excited to find a company that is just as passionate about supporting bees and sharing the benefits of their amazing products as I am. Their propolis spray is a go to in my house, you're not familiar with propolis it's a really cool substance that the bees make to keep the hive sterile and safe and to protect it from pathogens and invaders. And this became part of the beekeepers family when my friend and Beekeeper's Naturals founder Carly Stein was inspired to reinvent the medicine cabinet. She discovered propolis which is like I said a powerful ingredient that bees use to protect their hive from germs. She had struggled with low immunity her whole life and propolis was the first thing that actually made her feel like her health was in her own hands and that experience inspired her to tackle modern health issues from stress-based low immunity to brain fog to energy through ingredients found in nature and found with the bees.

This one, like I said, is a go-to in our house, we use it almost daily and they have other amazing products as well including some that give me a big boost of energy like B.LXR and ones my kids loved like B.powered which has a mixture of all kinds of beneficial bee ingredients from bee pollen to honey and even royal jelly. So, today there's this exclusive offer just for you for listening. Beekeeper's Naturals has created a discount, if you go to [beekeepersnaturals.com/wellnessmama](https://beekeepersnaturals.com/wellnessmama) and use the code `wellnessmama`, you will save 20% on your first order. You can also find Beekeeper's Naturals now nationwide in 2,000 stores including Target, Whole Foods and Sprouts.

This episode is sponsored by Levels Continuous Glucose Monitors. I have been experimenting with this continuous glucose monitoring system for the past few months, and I've learned so much personalized data about my body's own response to different foods, even to workouts, to sauna, and to when I don't get enough sleep. I've been using Levels, and this has made a significant difference in the way I track my glucose data, and especially as it relates to diet and fitness. Levels is cool, because in addition to providing you with the continuous glucose monitor sensors, their app interprets your data, scores your individual meal, and allows you to run experiments across different inputs like diet, exercise, or even fasting protocols.

They're backed by a world-class team, including Stanford-trained MD, top engineers from SpaceX and Google, and a research team that includes legends in the space like Dr. Dominic D'Agostino and Dr. David Perlmutter, both who have been guests on this podcast before. Health is so personalized, and this has given me a way to know the best foods for my own body, and it's helping me get enough protein and carbs while still maintaining weight loss. Levels is currently running a closed beta program with a waitlist of 100,000 people, but, as a listener, you can skip that line and join Levels today by going to [levels.link/wellnessmama](https://levels.link/wellnessmama).

Katie: Hello and welcome to "The Wellness Mama Podcast." I'm Katie from [wellnessmama.com](https://wellnessmama.com) and [wellnesse.com](https://wellnesse.com). That's wellnesse with an E in the end. And this episode is all about glutathione, free radicals, antioxidants, and aging. I'm here with Dr. Steve Morris who is a physician who is currently serving as a

scientific adviser and principal formulator in the nutraceutical industry. He has done a lot of research and worked in various areas and approaches, but today we talk specifically about his work on glutathione.

We go deep on what a free radical is and why it matters, why it's considered the master antioxidant, exogenous versus endogenous antioxidants, so ones that you consume versus ones that your body makes, the worst free radicals that we are exposed to, and spoiler alert, they're made within our body, how mitochondria creation of ATP creates free radicals., why we see an age-induced decline in the body's ability to produce glutathione, what superoxide dismutase is and why it's important, and so many other topics. This is really fascinating episode, especially if you have any kind of inflammatory response. We'll talk about the role of these compounds on inflammation and aging. I definitely learned a lot, I would guess you will too. Let's jump in. Dr. Morris, welcome. Thanks for being here.

Dr. Morris: Hi, there. Great to be with you.

Katie: I'm excited to get to deep dive on a topic you are an expert in today. Before we jump into that, though, I have a note in my show notes that you lived in Brazil for a couple years, and you speak fluent Portuguese. I'm curious, why did you live in Brazil?

Dr. Morris: Good question. I was actually down there as a missionary for a couple years, doing all kinds of service. And when they do that, you go down there, and, I mean, I didn't speak a lick of Portuguese at all. And you're just kind of immersed in the culture immediately, and, you know, you have to get trial by fire. Learn it or you don't eat. And so, anyways, yeah, so, I came back. And it was interesting speaking it for two years and not really speaking English. I had a hard time transitioning back to English when I came back. So, anyways, it was a good time, fun experience.

Katie: Wow. Were you at the point of even thinking and dreaming in Portuguese?

Dr. Morris: Oh, yeah. Yeah. That's another thing. That's when you know you've really learned a language, when, like, you have a dream about you're, like, family members at home that you know don't speak that language, and they're speaking to you in it. So, yeah, it was weird.

Katie: I've always thought the way we teach language in school is highly ineffective, because I took four years of high school Spanish and was, like, roughly able to get by. And then, spending two weeks in a Spanish-speaking country, it all just clicked into place. So, that's really cool that you got to do that.

Dr. Morris: Yeah, it was a good time. Good time. I agree with you on that, for sure.

Katie: Well, I know you are an expert in a topic that I've gotten quite a few questions about, and I'm excited to learn more about today, which is the topic of glutathione and a lot of things related to that. But I'm pretty sure most people have at least heard of glutathione. But to start broad and kind of build a foundation for this conversation, can you walk us through more specifically what glutathione is?

Dr. Morris: Yeah, absolutely. So, it's often... Well, let's start with, actually, if you don't mind, start with antioxidants, or, excuse me. Let's start with oxidative stress. What are free radicals? We hear that word all the time, right? You know, free radicals are bad for us. You need to be taking this and taking that, and it's, you know, antioxidant here, antioxidant there. What is a free radical? Well, from an educational standpoint, a free radical is an erratic, unwhole, unstable atom or molecule, okay? So, atoms, by nature, like to be whole. When they lose a part of them, which is usually an electron or a hydrogen atom, they become erratic, and they go around scavenging, trying to find another electron or hydrogen to replace it. And that's what makes them dangerous, because the place they often go is to DNA or cellular structures in your body that are vital, and it, you know, can wreak havoc on your body. And that's what oxidative stress is.

So, antioxidants, what they do is they readily donate these electrons or hydrogen atoms to these bad guys, and render them inert. Now, glutathione. Glutathione is often referred to as the master antioxidant in the body. And it is. And the reason why it is is...there's multiple reasons, and we'll talk about those today. But the main thing is that it readily, more than anything else that we ingest, or inside our bodies, it readily donates. It's a giver. It readily donates an electron or proton to, you know, these bad guys.

You know, there's two forms of antioxidants. There's exogenous, and those are things that we eat. So, like, the fruits and vegetables and dietary supplements, and, you know, they're good. But there's a thing called bioavailability, which is a fancy word for, you know, like, how much of something does your body actually...is your body actually able to use when you ingest it? And, oftentimes, a lot of these, these exogenous antioxidants, the bioavailability, or, you know, their effectiveness, is really low. You know, it just kind of goes right through us. And then there's endogenous, and that's what glutathione is, and that means it's what your body makes. And your body makes glutathione.

Katie: So, just to recap, because this is a little bit of a flashback to potentially some high school science for a lot of us, when we're talking about free radicals, because they're unstable, they are designed to move to whatever area they can become stable by essentially bonding with what they need, correct?

Dr. Morris: Yeah, pulling, pulling, you know, like cherry-picking an electron off of a, or a hydrogen atom off of a, you know, a strand of DNA. And then, you know, we have mechanisms in our bodies to repair that. But as we age, you know, that doesn't occur as much, and, you know, it just, with time, we get less effective at fixing those things. And then you get, you know, mutations, which lead to chronic disease, like cancer, diabetes, heart disease, you name it.

Katie: Okay, so, if I'm understanding it, in an absence of an adequate amount of antioxidants, these are more likely to pull that from vital tissues in the body. Whereas if we have antioxidants available, it's gonna more easily bond to those?

Dr. Morris: Perfect. Exactly. Yep. The key to this glutathione is the sulfur atom, okay? It's called a sulfhydryl group. And all that is is a fancy term for a sulfur atom attached to a hydrogen. That sulfur bond to the hydrogen, it is really weak, so to speak. It, more than anything else, it readily gives up that hydrogen, or electron, to, you know, free radicals better than anything else.

Katie: Got it. Okay. And where do free radicals come from? I would guess that a lot of different potential sources. And I would guess that maybe we're having a higher exposure than we have in the past to some of these sources, considering things like chronic disease and cancer are on the rise. But how are we exposed to free radicals?

Dr. Morris: So, there's, really, there's two ways that we're exposed. And once again, it kind of goes back to that outside/inside thing. Believe it or not, the worst free radicals we're exposed to, we actually make inside our bodies. If you go back to the high school chemistry days, or not chemistry, biology days, learning about the cell, the powerhouse of the cell, mitochondria, that create, you know, the energy currency of the body. That process of creating the energy currency, ATP, creates really, really, really bad free radicals. Now, in healthy cells, and healthy mitochondria, those free radicals are rendered inert by glutathione and other things. And they don't pose a threat. But, once again, as we age, or if we have a chronic disease, or, you know, we're under a lot of stress, it can make those mitochondria leaky, so to speak, and allow these free radicals to leach out into the body and cause damage.

The other place we're exposed to, obviously, is outside. I mean, we're constantly bombarded by free radicals, the foods we eat, the air we breathe, the sun. And I'm sounding like a doomsdayer. I'm not. It's really, it's just part of life that our bodies have evolved to an extent that we're able to control this for the most part. And that's why we're, part of the reason why, you know, we're able to live as long as we are.

Katie: And it would seem like, especially if these are things created within our body, like you said, there's a natural process for handling them. And it would seem like there's also kind of a threshold component here that, like, within a certain amount, they serve a purpose, I would guess, within the body, and our body knows how to handle them. So is this more an issue of we're having, like you just mentioned, exposure to a higher number of these, and also probably a depleted consumption and creation of antioxidants as we age? And so, this is, like, a balance, like, we're never going to eliminate free radicals, so we're creating a threshold in which we can safely handle them?

Dr. Morris: Yeah, exactly. It's a combination of both. Exactly. I, you know, I don't have any hard data. And I don't think anybody does, really, as to, you know, we have an X percent rise in the number of free radical exposure from 1970 to 2021. We just don't know that. But we postulate that. I do think that's one of the components. And the other component is that we, as we age, it is proven. There was a study done in "The American Journal of Nutrition" that actually showed that by about the ages, between the ages of 30 and 40, we start to see a decline in the body's ability to not only produce new glutathione, but also, what I call recycle it. And I'll explain more about that. And it's, once you reach the age of 60 to 70, you're looking at two and a half to three times lower amount of glutathione in your body than when you were, you know, 30 or younger.

Katie: I'm in my 30s, and I've noticed it does feel different than being in my 20s for sure.

Dr. Morris: Oh, yeah.

Katie: But in some ways, also a lot better. I've had some positive health changes. But before we dive deep on glutathione, I'm curious, can you just give us an overview of some of the other sources of antioxidants? Because certainly, we've all heard things like green tea has antioxidants, certain foods have antioxidants. What are some other sources? And how do those compare to glutathione?

Dr. Morris: You know, endogenously, once again, inside our bodies, our bodies make what's called superoxide dismutase. It's a long word. We abbreviate it SOD. You'll see that on the shelves of, you know, dietary supplement stores. How bioavailable, once again, how, like, how much of it we're actually able to use when we consume it? It's not much. So, it's, once again, it's created in the body. You know, other areas, obviously, you mentioned green tea, and then, with the product that we're gonna talk about today, the formulation, you know, quercetin is another really big source of antioxidants. Alpha-lipoic acid, resveratrol, broccoli, which contains sulforaphane, is the fancy chemical name inside broccoli, and cauliflower. Elderberry is another one. Basically, any fruit or vegetable that has, if it's deep and rich in color, contains antioxidants or polyphenols. So, that's what you need to be looking out for if you want to increase, you know, even more.

Katie: Got it. Yet another reason to consume lots...a wide range of micronutrient-rich foods and fruits and vegetables.

Dr. Morris: Perfect.

Katie: Yeah, I think that's a recurring theme for sure. I'm also curious, before we delve into this, since this is a natural bodily process, is there a time and a place for that response, and/or a time and a place when you wouldn't want to blunt that response immediately? So, for instance, I've seen kind of conflicting data on immediately post-exercise, for instance, taking antioxidants, because there's a role of you actually want some version of that response after a hard workout. Is that, am I remembering that right? Or can you explain what's going on there?

Dr. Morris: To a degree, yes. So, a comparison I often use, and it's... For instance, when you get sick, when you mount a fever, that fever, to a degree, is good for you. Not only is it increasing the temperature of your body, which makes you uncomfortable, but that increased temperature is two things. One, it helps minimize the growth of the bacteria or viruses causing the infection, because it can't operate in that hot of an environment. Two, it means that there's more metabolic processes going on, meaning your white blood cells are attacking them, okay? And so, we take ibuprofen or Tylenol to reduce the fever, we feel better, but it's, in some ways, blunting the response, our immune response. Now, I'm not saying that it's a bad thing that... I take ibuprofen all the time. But it's a very, very similar thing.

I think working out, post-workout, yeah, there is a release of free radicals and different toxins from the muscles, for sure. If anybody's, you know, here has had a very deep tissue massage before, if you don't drink lots of water the next day, you can feel really sick after. It's because you're releasing certain toxins into the bloodstream. I wouldn't say that it's a bad thing to take a glutathione supplement afterwards. It's not going to necessarily blunt any positive return that you would get from working out. If that makes sense.

Katie: Yeah, the data I've seen, if anything, it just seemed to be in a very narrow window, like that immediately after working out... Same with, like, an ice bath. You wouldn't necessarily, if you were trying to gain strength, want to do it immediately after, but it has a lot of benefit in a window after that.

Dr. Morris: Yeah, there... In essence, when you're working out, you're breaking the muscle down. You're not actually building, you're not... You know, you may feel like you're pumped up, you know, when you're lifting weights and working out, but really, you've just torn the muscles down. The building occurs afterwards. So yes, you are right.

Katie: Okay. So, let's go deeper on glutathione. You mentioned this is a thing our body does produce naturally, but it declines with age. What's the process by which we create it endogenously?

Dr. Morris: So, it's a two-step process. And there's three building blocks, key building blocks. One of them is the rate-limiting, like, most important building block, and that is cysteine, which is basically an amino acid. You know, you can buy it off the shelf, it smells like sulfur, because it has sulfur in it. It is the rate-limiting factor in the production of glutathione. If you don't have enough cysteine in your body, or sulfur, you can't produce the right amount of glutathione. So, that's one building block. The second one is glutathione. Or excuse me, sorry, glutamine. It's also an amino acid, okay. And the third one, that we will talk about too, is glycine. So, and that's another amino acid. So, those three building blocks are the three that make up the molecule of glutathione. And it goes through two steps. There's two enzymes that are utilized that are in the bloodstream that make this, and that's how it's made. So, really, what it boils down to is is, you know, are we getting enough sulfur in our diets, number one. And, along with that, are, you know, are we getting enough cysteine donors, or molecules that are able to readily donate cysteine to make this?

Katie: Gotcha. And I know you have a specific solution to this, but I'm also curious, what are dietary sources of sulfur and/or these amino acids? And are those worth supplementing with if someone knows that they might be either at an age or have a reason for their glutathione production to be lower?

Dr. Morris: No, definitely. Most definitely. You know, I've got a list. You know, if meats don't bother you, turkey, chicken, fish. Beef even has high amounts of it. If we get into plants, we look at nuts and seeds, grains, legumes, especially walnuts, like, as far as nuts go. Then we have what are called Allium vegetables. That's A-L-L-I-U-M. And those are the vegetables that we typically think of that have kind of a very strong odor or taste. So, that would be like onions, garlic, leeks, scallions, shallots, things like that, that... And you'll know, usually what I say is, if you cook with it, and you put it in the fridge, and the next day, it smells like sulfur when you open it up, that's a sulfur-containing one. And then the other one is the what are called cruciferous vegetables. And those are things like broccoli, cauliflower, cabbage, arugula, kale. All those sorts of vegetables. So, those are good places to get sulfur. Sulfur is very, very key, not just in the production of glutathione, but in several enzymatic processes in the body. So...

Katie: Yeah, that brings to mind another podcast guest I've had in the past, Dr. Terry Wahls, who had an amazing recovery from MS. And her protocol involved a lot of brightly colored vegetables, Allium vegetables, and cruciferous vegetables every day to, like, hyper-load that response and flood the body with micronutrients. And it makes sense based on what you just explained.

I would guess there's also a point, certainly, I would guess things like any kind of gut issue and absorption issue would decrease the amount of these things you can even absorb from food. Also, you mentioned these all slow down with aging. So, our ability to convert slows down with aging. So, that makes me think, you know, like, obviously I always defers to it when it's possible. It's great to get everything from food. But also there's very much a time and a place to support the body supplementally, especially in today's world, with declining nutrient density and an increase in free radicals like we've talked about. How might a person know if their glutathione production is declining, or is that a thing we can just essentially assume happens with age?

Dr. Morris: I think you can essentially assume that it happens with age. I mean, it's pretty much proven, like I said, in that study, and there's been various other studies too, that have demonstrated that, but there's a couple of things. I mean, there is a blood draw that you can get, that is a ratio of what's called reduced glutathione, which is the stuff that's active. And then it's a ratio of that to the oxidized form of glutathione, or spent. And most of the studies, that's what they look at, is they look at the ratio of that. You want that ratio to be higher. You want more reduced glutathione versus the oxidized form. The body has a way of recycling glutathione, has an enzyme that basically takes what's called glutathione disulfide, which is two glutathione molecules hooked together, they're missing their hydrogens, or their electrons, they've given away. And it then adds another electron or hydrogen to it. And it creates two brand new forms of glutathione. And both of these...so, what contributes to the reduction of glutathione with age is not only are we producing less, but we're recycling at a slower rate as well.

Katie: Got it. Okay. So, then, definitely seen a lot of information about glutathione supplements. What happens when we take an exogenous glutathione versus when we create it internally in the body? Does the body recognize those as different? Or does the body use it in the same way?

Dr. Morris: Good question. So, I often refer back to it, like, you know, in the hospital, when we have patients come in that have overdosed on Tylenol, what ends up, unfortunately, killing them is the fact that they've literally oxidized every last molecule of glutathione in their liver, and in their body. And so, we, the only way we have to supplement them in a hospital, effectively, is aerosolize, or, you know, through a breathing treatment, what's called N-acetyl cysteine, NAC. And it's a cysteine donor, okay? It happens to be on the market readily, once again, as a dietary supplement. The problem is is if you take it in a capsule, or ingested, basically, its availability to the body is 10% or less, it's not that high. And that's why we have to aerosolize it. You know, if we could do that at home, that would be great. But unfortunately, that's a drug, it then becomes a drug.

Pure glutathione, for instance, you'll see that in the market as well. Its bioavailability is extremely low, even lower than NAC. And then, there's some companies that are, you know, touting what's called, liposomal glutathione, and that's basically glutathione that's been kind of encapsulated so that when you ingest it, it doesn't get broken down by the stomach or the liver. And the problem with that is this. Just like...you've heard the term, you know, moderation in all things, right? You can have too much of a good thing, okay? The body has an innate mechanism that we developed over time, as, hundreds if not thousands of these, actually, called inhibitory feedback mechanisms. So, the way I kinda relate it is when you go to fill up your car with gas, put the pump in, you know, and you click the handle on and you let it go, right? That pump has a sensor that senses when it's starting to get full, and it clicks off. Okay, it's a feedback mechanism, all right? If it didn't have that, and you may have seen this at the gas station, where it's, you know, it's defective or whatever, you get spillage and overflow. And, you know, that can wreak havoc. Fires, whatever.

The body knows how much glutathione it needs. And it may need more at a certain time and less at another time. And so, by taking liposomal glutathione, you're bypassing that process, that innate process. And what, in essence, what's happening is that you can enter what's called a hyper-reductive state. So, instead of being in a hyper-oxidative state, where you got all this oxidation going on, you're in a hyper-reductive state, which is equally as bad. If that makes sense.

Katie: That does make sense. And I definitely agree with you that too much of a good thing, I think that's a important thing to remember, even with water. We see that with literally everything. There can always be too much of a good thing. So, how do we know what that threshold is? And is there a way to consume glutathione in a bioavailable way, that does not bypass that process?

Dr. Morris: There is. And, you know, let's see, it's been a little over a year ago, I started looking into, you know, there's got to be a way, you know, to get a cysteine donor, that key element, that is basically the fuel driving the production of glutathione. There's gotta be a way to get that to, you know, to the body orally, at higher than 10%. You know, without bypassing these innate mechanisms that we have that are very important. And, came across a molecule we abbreviate as NACET. And it stands for N-acetylcysteine, which is NAC, but it has two other chemical groups attached to it, an ethyl and an ester group. And those are very important groups. What those do is they allow the molecule of NAC to become bioavailable up to 68%. So, it's the highest amount of any other supplementation out there. It also allows the molecule to readily cross what's called the blood-brain barrier. That's the barrier that protects our brain from toxins. No other cysteine donor supplement on the market does that. So, it readily crosses, and it's able to do its job in the brain as well, to help reduce oxidation in the brain. And, in utilizing NACET, you're not, like I said, you're not bypassing that, you know, natural feedback inhibitory mechanism, and you're, in essence, you know, boosting your availability of cysteine by, you know, six times or more.

Katie: Wow. And I know there's been some controversy with NAC recently, and it was even pulled from the market in that form, and now it's hard to find. So, this formula with adding those other groups, since it's handled differently in the body, I'm assuming that's still available.

Dr. Morris: Yes. Yeah. And, I, you know, and this is my personal opinion. I think that'll probably be overturned with time. It's...a lot of that is politically motivated, unfortunately. Yeah. Like I said, we use it in the hospital. Really, when it constitutes a drug, and that's the problem, is how it's delivered. If it's delivered intravenously, or it's aerosolized, it is then a drug. So...

Katie: Got it. Okay. That makes sense. And, like, I've seen some of this as well. And I know, like, for a while, it seemed like there was a lot of marketing that the liposomal form was good. And I saw a lot of companies that were marketing the liposomal form, but you're saying that one, especially, in large amounts, can actually create that process that's more...it can be dangerous as well, if you're just, that bypassing the body's natural system?

Dr. Morris: Yes, that's right. Yeah. I...myself, and several of my colleagues that are experts in this area, they've tried to get that out there, saying, "Hey, you know, this is not necessarily a good thing, that it's that available to the body, because you're bypassing things that are there to protect you."

Katie: Gotcha. Okay. Well, when consumed correctly, and being an antioxidant, I would assume there's also an anti-aging component with glutathione. Is that correct? And if so, does that exhibit even on, like, a cellular level, in the skin, or do we see positive aging benefits from consuming glutathione correctly?

Dr. Morris: Yeah. You know, glutathione is found in, virtually throughout the entire body. And, you know, like, we've...you stated, and with, you know, your background and knowledge of oxidation, you know, the older we get, the less efficient we are at ridding ourselves of free radicals. We also accumulate more damage to our DNA. By increasing glutathione, you know, we're able to not necessarily turn back the clock, but slow the progression, if you will, of aging and development of a lot of the chronic diseases we see today. The truth is the three big, you know, killers, diabetes, heart disease, and cancer, the root of all of those is inflammation or oxidation. All three of them. And if we can slow that down, if we can mitigate that to some degree, we can, you know... I can't say, you know, "cure," or "fix," or anything like that, but it certainly helps in those areas. So...

Katie: Yeah, and the role of inflammation and chronic disease has certainly been a recurring theme in the literature I've seen recently and also, in previous podcast guests, like, we know there's that inflammatory connection with chronic disease, we've seen the inflammatory connection with even certain acute responses in the body. We're starting to understand so much more that role of inflammation. And so, you're saying by acting on the free radical response, glutathione also has the mechanism of reducing inflammation in the body?

Dr. Morris: Yeah. To a degree, yes. Yeah. I did a study... It's been 20 years ago, I think. I can't believe it's been that long. But, you know, we did it on atrial fibrillation, which a lot of, a large component of the population have, which is basically, you know, the heart, instead of beating, you know, the way it's supposed to, it quivers. And so, you develop blood clots, you have to be on blood thinners, you can have a stroke. And we linked several inflammatory markers to that disease, even. And so, yeah, glutathione is very...and I need to say, too, glutathione doesn't just donate an electron or a hydrogen and render a free radical inert. It also helps other antioxidants, both exogenous and endogenous antioxidants, function better. So, it's...that's...hence why it's called the master.

Katie: Got it. And I've also seen research related to the inflammatory response in the brain, and how that expresses in a whole variety of different conditions. Is glutathione something that's capable of crossing the blood-brain barrier and working with inflammation in the brain as well, or how does it work there?

Dr. Morris: Absolutely, yeah. I mean, so, that's the big thing with NACET, the, you know, the discovery of this, N-acetylcysteine ethyl ester. It is the only molecule that we know that readily crosses the blood-brain barrier, so it's able to go in there, into the brain, provide that cysteine fuel, to make glutathione in the brain. And yeah, so it, yeah, it definitely, more than anything else out there in the market can help mitigate inflammation and oxidation in the brain.

Katie: And just extrapolating from what we've talked about, I would guess that anybody who knows that they're dealing with some kind of inflammatory response would benefit, especially from getting their body's glutathione levels up. But are there studies or things where they've looked at it in specific conditions or responses?

Dr. Morris: There are. And they're usually, you know, smaller pilot studies. But, you know, and then, of course, there's anecdotal evidence, which is not scientific. But that doesn't mean that it's not true or real. I would always tell patients, and still do, you know, there is such a thing called the placebo effect, right? But the brain is a very powerful tool. And you can take a medication all day that we know works, but if you don't believe that it's gonna work... I've seen people that it doesn't work. So, I tell people, you know, as long as you're not getting ripped off or scammed, or you're taking something that's completely off the wall and bad for you, if you feel it's helping you and you're feeling better, who am I to tell you that it's not working? You know what I mean?

Katie: Yeah, exactly.

This podcast is brought to you by Beekeeper's Naturals, my source for B.Powered products. I loved bees and the many benefits of all their amazing compounds since learning how to keep bees and be a beekeeper as a kid. And I was so excited to find a company that is just as passionate about supporting bees and sharing the benefits of their amazing products as I am. Their propolis spray is a go to in my house, you're not familiar with propolis it's a really cool substance that the bees make to keep the hive sterile and safe and to protect it from pathogens and invaders. And this became part of the beekeepers family when my friend and Beekeeper's Naturals founder Carly Stein was inspired to reinvent the medicine cabinet. She discovered propolis which is like I said a powerful ingredient that bees use to protect their hive from germs. She had struggled with low immunity her whole life and propolis was the first thing that actually made her feel like her health was in her own hands and that experience inspired her to tackle modern health issues from stress-based low immunity to brain fog to energy through ingredients found in nature and found with the bees.

This one, like I said, is a go-to in our house, we use it almost daily and they have other amazing products as well including some that give me a big boost of energy like B.LXR and ones my kids loved like B.powered which has a mixture of all kinds of beneficial bee ingredients from bee pollen to honey and even royal jelly. So, today there's this exclusive offer just for you for listening. Beekeeper's Naturals has created a discount, if you go to [beekeepersnaturals.com/wellnessmama](https://beekeepersnaturals.com/wellnessmama) and use the code `wellnessmama`, you will save 20% on your first order. You can also find Beekeeper's Naturals now nationwide in 2,000 stores including Target, Whole Foods and Sprouts.

This episode is sponsored by Levels Continuous Glucose Monitors. I have been experimenting with this continuous glucose monitoring system for the past few months, and I've learned so much personalized data about my body's own response to different foods, even to workouts, to sauna, and to when I don't get enough sleep. I've been using Levels, and this has made a significant difference in the way I track my glucose data, and especially as it relates to diet and fitness. Levels is cool, because in addition to providing you with the continuous glucose monitor sensors, their app interprets your data, scores your individual meal, and allows you to run experiments across different inputs like diet, exercise, or even fasting protocols.

They're backed by a world-class team, including Stanford-trained MD, top engineers from SpaceX and Google, and a research team that includes legends in the space like Dr. Dominic D'Agostino and Dr. David Perlmutter,

both who have been guests on this podcast before. Health is so personalized, and this has given me a way to know the best foods for my own body, and it's helping me get enough protein and carbs while still maintaining weight loss. Levels is currently running a closed beta program with a waitlist of 100,000 people, but, as a listener, you can skip that line and join Levels today by going to [levels.link/wellnessmama](https://levels.link/wellnessmama).

I'm curious from the anecdotal side. I know that you guys have worked to release to get this product out to people. Who are you finding is most often taking it, and what kind of results are they seeing?

Dr. Morris: Yeah, so we see it, you know, a wide variety. So, from very healthy athletes. And they're seeing, you know, increased focus, energy, sense of well-being, just a general health, they just feel better, to people that are, you know, overweight to a degree. And they're actually seeing some weight loss with this. And then, you know, to people that have, you know, autoimmune inflammatory disorders. For instance, we do have one person in particular that has interstitial cystitis, which is a really tough condition to treat because... and it's basically an inflammatory disorder of the bladder. And we have lots of ways we can help, you know, mitigate the symptoms. But this particular patient, it's mostly in women, started taking this, and was not taking it with the intent that it would help with interstitial cystitis. She's, you know, taking it because she thought, hey, you know, I'll give it a run. Once she started taking the supplement, you know, she noticed that her symptoms were getting less and less, and eventually started to go away. Now, once again, I'm not saying that it cures it. That's not it. But it certainly, in an anecdotal way, for her, has helped tremendously.

Katie: And I'm curious... I know, like, there's the sulfur component here. And certain people have genes that don't respond well to certain sulfur-related compounds. I'm curious how this comes into play with that, and if this form is able to be safely absorbed by those people?

Dr. Morris: So, let's talk about that. Yeah, so, people often say, "Oh, I have a...", they'll say "...a sulfur allergy." What they've been told is they have, usually, from their doctor, a sulfa allergy. That is a completely separate thing from sulfur. So, trimethoprim, sulfamethoxazole, is a common drug. It's a antibiotic, given to people, that people are allergic to. It's the drug they're allergic to, not sulfur. Then there's the whole thing of, you know, you'll see on a lot of shampoo bottles now, or personal care products, because I formulate those as well, you know, sulfate or sulfite-free. Those, once again, are completely different. It's not the atom sulfur that you're allergic to. If you were, you'd be dead, because sulfur is everywhere in your body. It's the drug. It's the molecule itself that you're allergic to.

Katie: Gotcha. That is helpful to understand, because I have a couple of those genes, and I've reacted poorly to certain supplements before, so, really helpful to understand.

Dr. Morris: Yep, exactly. Like, for instance, so, you know, one of the big... So, soap, initially, it didn't foam, you know, several hundred years ago, when they created soap. It was made from, rendered from fat. It didn't

foam. Soap only started to foam when we came up with surfactants, and specific surfactants that are used in...less now, but were heavily used, and I guess still are, SLS, SLES it's abbreviated sometimes, sodium lauryl sulfate, it's that "sulfate." And, you know, some people are allergic to those. They'll get, you know, dry scalp with these, the shampoo, they'll break out in a rash. I know it's used in a lot of toothpaste. And I know, for instance, myself, if toothpaste has it in there, I end up getting a film in my mouth, and it's the skin sloughing off. I'm allergic to that in my mouth, in the mucosa. So, once again, it has nothing to do with the actual atom.

Katie: Okay, so, let's talk briefly about the specific formula that you have created and formulated, and I know you've explained kind of the process of it, but how does this work specifically in the body in a different way? And is it a risk to that threshold problem? Or does the body...is the body able to modulate how much it needs with that form?

Dr. Morris: Very good question. So, yeah. So, stumbling across in, you know, researching and spending a lot of time, you know, in books and on PubMed coming across this NACET, I, you know, from medical training, knew that cysteine is the, you know, the key driver in this process, and, you know, we have a hard time getting enough of it in our bodies. And so, I thought, let's combine and make, you know, basically a super glutathione product. So, not only providing that cysteine donor component, which is an acid, but also putting in this formula the other two building blocks we talked about.

Glycine and glutamine are both in there, as well as several other ingredients, milk thistle, quercetin, things that I kind of mentioned earlier. Alpha-lipoic acid, resveratrol. We even have a broccoli extract in there as well, that's standardized, that has sulforaphane, that I mentioned. Elderberry, blueberry extracts are in there as well. And the whole point of this supplement is to help boost and support glutathione production, as well as the recycling of glutathione, and the recycling of other antioxidants. So, if you would drink a glass of orange juice, vitamin C is a great antioxidant, but once it's spent, it's done, and it can't be recycled. Glutathione recycles it. Can make it useful again.

Milk thistle, for instance, that's in our formula, just by itself has been shown to increase glutathione by up to 35%. It also increases that other molecule that I talked about, SOD, superoxide dismutase. It's been used for centuries, by multiple populations. Quercetin is another one as well, that's been used for a very long time. It's a key component, or helps with what's called phase one and phase two detoxification. And those are two key pathways in the liver to help detoxify the things that we ingest. Everything we ingest goes through the liver, essentially, and the liver filters it. And that's why when we ingest things, we end up not getting a lot of what we ingest, because the liver filters it out, breaks it down, the stomach acid, things like that. It's called the first-pass effect.

Katie: Got it. And I know glutathione is very supportive of the liver, which is the master organ, if we're talking about master oxidants. So, impaired liver function has wide-ranging consequences throughout the body, so any way we can support the liver essentially supports every reaction in the body, in a profound way. And I'm glad you brought up the sulforaphane component as well, because I've written about sulforaphane and talked

about it on this podcast. I know there are people like Dr. Rhonda Patrick, who talk extensively about it, and its role that we're understanding more and more in the research. And it seems like for a long time, we knew it was available in food, and things like broccoli sprouts, which I've grown in my kitchen. But it seems like it's more recent that we're able to stabilize it and get it into a supplement form that's beneficial to the body. Is this a new thing, or am I just seeing this recently?

Dr. Morris: No, its...you're right. It's... I think it's probably... I mean, it's been around for a decade or two, but it's becoming more mainstream now. And what you're...yeah, exactly what you're talking about is a standardization, basically. So, instead of just taking broccoli powder, or eating broccoli, which is good for you, there's a lot of other things in broccoli that are good for you, this is standardized, meaning that it has, like, you know, a percentage of that powder is guaranteed to have X amount of sulforaphane in there.

Katie: Got it. And I know, I will make sure I put links to the specific supplements. People can find it in the show notes. Those are at [wellnessmama.fm](http://wellnessmama.fm) for you guys are listening. I know there's a special offer as well we'll mention at the very, very end. But as we get close towards the end of our time, a few questions I love to ask, the first being, from your own perspective and your own health on a daily level, what are some of the things that you consider most important, kind of the 80/20 of things you do regularly for your own health?

Dr. Morris: Oh, boy. For my own health. Yeah, I, you know, I try. That's a tough one to answer. I can...you should do what you say, right. So, I do try to do what I say. But clearly, exercise is a very key component. And by that, I don't mean going to the gym and, you know, sweating it out every single day. I used to do that, and, you know, it wore me down. And everybody's different. Some people are made to do that. Others are not. But getting in at least 30 minutes of some form of aerobic exercise. Going for a walk is enough, okay, for some people. I know with COVID, it's been difficult. We've been locked indoors. But, you know, and we're starting to see a little bit of resurgence of that, but people are getting out more. Exercise...I don't even need go into that as to why it's good for you.

Like I said earlier, moderation in all things. It's...yes, we need to eat fruits, vegetables. We need to be, you know, drinking plenty of water. I think that's a big component as well. But, you know, moderation. It's okay to have, now and then, vices, okay. And that's where this boosting glutathione is helpful to a degree. So, you know, staying happy. I think the brain is probably, not probably, it is the most powerful tool. It certainly utilizes more energy than any other organ in the human body. And it also consumes more blood than any other organ in the human body. Which tells you something. I mean, that's... it's a very, very powerful tool. So keeping, staying healthy up here. And whether that's through meditation, doing yoga, whatever works for you, to be present in the moment. I think us as humans, and in particular Americans, we have a hard time in life focusing and being present in the moment. I know, myself, I'm always worried about the past and the future. I have been. And so, for me, I try to engage in activities that keep me present.

Katie: That's great advice. And especially the brain side, I've learned more and more... We know from the data, meditation, for instance, people who meditate regularly, their brains are seven and a half years younger than

people who don't, and I think when we're young, we get more opportunities, hopefully in a good way, even in a school environment, to exercise our minds and to learn and to grow and to see patterns. And that gets more difficult, or at least we have to be more intentional about it, as we get older, because I feel like we get more routinized, and have fewer opportunities naturally for that. But, to your point, we can make time for meditation, or yeah, like cool cognitive games and puzzles, and there's always gonna be learning experiences. We just have to prioritize them as we get older.

Dr. Morris: Yeah, and I wanna emphasize something. In life in general, and here's my counseling component to this, from a counselor standpoint, the moment you find yourself utterly and completely comfortable, there's something wrong. And that doesn't mean you need to be just miserable all the time. But there needs to be some level of discomfort in your life all the time, otherwise, you're not growing. You're not changing, and, you're standing... You've heard the term, "if you're standing still, you're not standing still, you're going backwards." And that is the truth. So, always finding things to change up, move, stimulate your mind, those are all good things. And then the last thing I would say for good health, and this is another big problem today, especially with sleep apnea, is quality sleep. So, make sure you get plenty of rest.

Katie: Yeah, and that's certainly being threatened in the modern world. I would say, the only commonality across every expert I've ever had on this podcast is the importance of sleep and quality sleep. I've never had anyone say sleep is not important or sleep doesn't matter, or you can get too little sleep and be okay. That is an absolute constant, and one that we don't, certainly, to your point, prioritize enough often in today's world. So, very sound advice. Another question I love to ask toward the end. Are there any other areas that are commonly misunderstood or not understood about your area of expertise that we haven't already touched on? And if so, what are they?

Dr. Morris: Boy, my area of expertise is kind of...it's broad. So, I initially started out as a family medicine physician. I did virtually everything. I was, like, an old, you know, old-time family doctor, I delivered babies, I worked in the ER, I rounded on patients, did minor surgeries. It burned me out pretty quick, talking about sleep. It was hard. But it gave me a broad view of the human body, versus looking at, you know, each organ individually, instead, looking at the person as a whole. And so, I entered the dietary supplement and personal care arena about 10 years ago with that mindset, the body as a whole, okay. And so, from that standpoint, I'm passionate about, you know, developing novel dietary supplements, personal care products, OTC drugs, that are science-based, that are efficacious, that are safe, and, you know, that actually help the consumer. And so, that's kind of where I...I don't know. That's what drives me.

Katie: I love that. Another question I love to ask for the end is if there's a book or a number of books that have had a profound impact on your life, and if so, what they are, and why?

Dr. Morris: Oh, wow. Yeah. One of them I can't say the name, because it's...this is a PG program. So I'll end with that book, but any of Brené Brown's books are very good. She's a...has a...she's a PhD in psychology, talks a lot about, you know, guilt and shame, and what that does to the brain and the whole body. All of her books have been great. Another really good book that I have read actually is by a former Holocaust survivor. He was a physician, actually, a psychiatrist, but Viktor E. Frankl, it's "Man's Search for Meaning". And that can be woman's search for meaning as well. And it's a very thin book. It's very short, quick read, but the gems that are inside that book are phenomenal. And then the last one is by Mark Manson, and it is, basically, it's how to un-F.U. your life, yourself, basically. And, you know, he just goes through, in a very comedic way, how to get yourself out of that rut, if you feel like you're in a rut physically, emotionally, mentally, or all of the above, you know, the different ways, and everybody is different. Two people can go through the exact same, exact same scenario. Exact same. And interpret it and feel and, in their bodies, react to it completely differently. So, we need to keep that in mind when, and have some compassion for others when we look at maybe the way certain people handle things or do things.

Katie: I second all of those recommendations. I'll put them in the show notes for you guys, and especially "Man's Search for Meaning" has been a constant in my life. It's one of the few books I reread every year. At the beginning of the year, I do a seven-day fast for the spiritual-mental benefits, and I reread that book, just as a mental reset, to be reminded of so many...so much good we have in life, and just mentally.

Dr. Morris: Yeah, no, I... There is another one, too. And, speaking of my time in Brazil, by Paulo Coelho. And he wrote a very famous book. It's been, boy, I don't know how many years ago, but it's called "The Alchemist." And there are a lot of very, once again, it's like a Viktor Frankl book. If you haven't read "The Alchemist," read it. Excellent book.

Katie: Agreed. And that's...I'll put that in the show notes as well. And then, lastly, as we wrap up, we talked a lot about glutathione, and in particular, the formulation you worked on. Where can people find this one? And I think you have a discount code as well.

Dr. Morris: Yes. Yeah, we do. So, for those that, you know, that are interested in this at all, go to...we've got, for the actual GSH, the actual capsule, we have two forms. The capsule form is [TryGSHplus.com/Mama20](http://TryGSHplus.com/Mama20). And if you go there, it'll give you a 20% off for being a part of this today. And then, we are also rolling out a gummy form of this, and when I tell you this tastes phenomenal, it tastes phenomenal. Like, it's...you're gonna wanna eat the whole bag at once. And, you know, it's really good. And that is...you will go to [kudogummies](http://kudogummies.com), that's K-U-D-O-G-U-M-M-I-E-S .com/Mama20.

Katie: Sounds good, and I will check it with my team and make sure those links are all in the show notes for you guys. I know a lot of you listen while driving or exercising, so, all of the links, everything we've talked about will be at [wellnessmama.fm](http://wellnessmama.fm), under this episode's show notes, so you guys can find it, but this is definitely a topic I had seen a lot of information on, but not ever gotten to go deep on. So I'm really excited we

got to delve into the world of glutathione today, and grateful for you, Dr. Morris, and your research. Thanks for being here.

Dr. Morris: No, thank you. Sure appreciate it. It's always fun. I love teaching and talking about this, so I appreciate you inviting me on your show.

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

If you're enjoying these interviews, would you please take two minutes to leave a rating or review on iTunes for me? Doing this helps more people to find the podcast, which means even more moms and families could benefit from the information. I really appreciate your time, and thanks as always for listening.