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Announcer: Bulletproof Radio, a state of high performance.

Dave: You're listening to Bulletproof Radio with Dave Asprey. Today's cool fact of the day is that pieces of Earth could actually grow on Mars. What I mean by that is that scientists have suspected for a long time that microbes in arid places can get their moisture from humidity alone, but no one has shown that dried out microbes can revive with water just taken from the air, until now.

Dave: Bacteria from Washington State's Hot Lake began growing after observing humidity in a jar, according to astrobiologists from Wichita State University in Kansas. Now, the researchers grew these bacteria in magnesium sulfate brines and this is also known as Epsom salts and perchlorates, which are toxic to humans, are the main types of salts found on Mars. Those salts don't keep water molecules away like the normal salt, sodium, that we like so microbes have a better chance of catching some moisture on Mars. We found these magnesium salt tolerant microbes in clean rooms where NASA build spacecraft. We might already have seeded Mars with life from Earth. That's kind of cool.

Dave: Now, would you believe that these same bacteria, they're called Halomonas, can infect humans? They can. What does this all mean for you? If we're looking for life on other planets, we may have already put it there, which is kind of cool. If you didn't get my amazing foreshadowing, we might just be talking about magnesium today. You probably missed that one, didn't you?

Dave: Anyhow, keep listening and you're going to find out, it's the Epsom salt kind of magnesium. Today's special episode of Bulletproof Radio is recorded live at the Beverly Hilton here in Los Angeles, which is the home of Upgrade Labs, one of the Bulletproof sister companies that's around creating the experience of upgrading yourself in way less time and you thought you would using the kind of techniques that you might hear about from Superhuman, my new book that just hit the

New York Times list a couple weeks in a row. Thank you so much if you bought the book. If you haven't yet, what are you waiting? This is going to give you decades more life. It's really worth five hours of your time to read it, I promise.

Dave: The guys I'm interviewing are guys who are not new to the show, but they are in town today for Meet the Hacker events that we hosted Upgrade Labs in Santa Monica and Upgrade Labs at the Beverly Hilton. These are guys who are experts in how to fix and optimize digestion. You might've heard them on Bulletproof Radio episode 515 or 611, when we talked about gut and digestion and how every little enzyme does its magic. We are talking about Wade Lightheart and Matt Gallant from BiOptimizers. Hey guys, welcome to the show.

Matt: Great to be here.

Wade: Great to be here, Dave.

Dave: Now, we talked about enzymes. We talked about gut digestion, the probiotics that you guys make, but we haven't really hit on magnesium. Let's talk about magnesium. I know why magnesium is important because well, I read other that stuff, but a lot of people listening have probably heard of magnesium is good for you and that's about it or take it for sleep. Why are you guys hot on magnesium?

Wade: Well, before we get into magnesium, let's talk about stress and in today's world where a lot of us are experiencing a different kind of stress than perhaps our ancestors with the rise of digital technology, the massive influx of electromagnetic pollution and also as I would say, the extension of the silicon brain to our carbon brains, which is causing a massive inflow of data and of course, the lifestyles that we're living. Combine that with the shifts in the last hundred years in food production and food distribution, which is radically altered and we solved the calorie problem and included a nutrient deficiency en mass. Particularly in North America, what happens is one of the stress responses is that you actually burn out a lot more magnesium out of your nervous system. The other factor is it's a food element that is involved in over 300 different reactions inside of the body, including a lot of magnesium-

Dave: You know what I like about this is that right in the middle of the show, your cellphone starts vibrating when you're talking about stress from digital devices.

Wade: It's kind of neat, right?

Dave: I've got this new chip in my head that lets me see people's heart rate variability and yours just dropped by 12

Wade: I believe it.

Matt: You know what, the thing too with technology is these dopamine hijacking systems, which is what Facebook and Instagram and all of these things are designed to do, create the stress response. Just to back off, to back up what we were saying, the technologies

that we're using of course it's enhancing our lives in a lot of ways. But it's also really accelerating the dopamine response, which is a stress response once it's really pushed to the max.

Wade: To echo that, I was ... And I got myself into a deep stress response committing to all these businesses and traveling around the world and going miss. I went to do some testing and because I wasn't feeling myself. I was getting burned out. My brain wasn't sharp as it is. I was like, something wrong here. I went over to Matt's place and hooked him up on some brain tech and he's like, "Dude, man, you got no electrical activity." I went and did some testing with my naturopathic doctor and he's like, "Look, here's what's happening. You are deficient in these elements. You're using dopamine channels to keep your adrenals going. You're dumping magnesium out of your system like crazy and you're wearing yourself out.

Wade: And so, we started looking into all the stuff about stress related to magnesium and there's a lot of research out there. I guess that Dr. Leopold Gallant is an MD who says stress increases the amount of this nutrient we lose from our body in urine leading to a dangerous deficiency. Ninety nine percent of the population is starting at a deficient rate and even just supplementing a little bit of magnesium isn't necessarily what we need in order to be optimizers, superhuman. We're not talking RDAs. We're looking at what makes a person in that superhuman level.

Dave: In fact, let's just pick on the RDAs for a second right here. The recommended daily allowance is the US government's recommended daily allowance for these minerals and vitamins and most governments on the planet have them. They don't agree mostly, and they're mostly based on 1950's science so we didn't understand. They couldn't even spell DNA back then because they didn't know about it when these days come out. They studied food grown in the 1950s, which was grown largely on permaculture or farms that had nutrients like magnesium in the soil.

Dave: The RDA also ... I'm 6'4". I only weigh around 200 pounds instead of 300 pounds, but the RDA for a 90-pound 90-year-old Asian woman is the same as for me. I guarantee you, she needs more of some things than I need and I need more of some things than she needs. The RDA is completely BS. It's still required to be put on labels, but it is meaningless when it comes to like magnesium until you know your genetics, your gut bacteria and you know your state.

Dave: If you're listening to this and you're saying, oh I've got enough. You didn't get enough. That's enough to keep you from dying of rickets if you're white.

Matt: That's the value too of biofeedback, which we'll get into as far as magnesium goes, but just to add to what Wade was saying. It's a vicious cycle so you're stressed out, you lose magnesium and you feel even more stressed out. That's what happened to Wade, which I've also experienced. Actually, remember we were in a Zen call [crosstalk 00:08:40] and I asked you, I said, "Hey, Dave, I can't drink coffee anymore. I feel frazzled every time that I do. I didn't know at the time but it was a magnesium deficiency. I think the magnesium is critical for the nerves, for the myelin sheath. Every time I drink coffee, I would just feel flat.

Dave: Even the lab test will Bulletproof Coffee was causing you problems?

Matt: Any coffee.

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Matt: It didn't matter. It was the caffeine response. It was the stress caffeine response that was just ...

Dave: Is that your body couldn't handle it. It turns out caffeine by itself is shown in studies to have health benefits now, which is kind of crazy. Some people if your adrenals are tweaked, it doesn't work. Most people though, even in stage 3 adrenal exhaustion can handle a cup of coffee in the morning and they actually get their life back because it helps to raise cortisol in the morning and their cortisol is all broken. Were you that far? Your cortisol was-

Wade: I was definitely in that round. The thing was is I was relying as coffee to kind of keep me going.

Dave: You can't do that.

Wade: I think that's a normal response to a lot of people in general public, like you know what? I'm just going to take a coffee. Then all of a sudden, it was like, well, I need another one at noon. Then I remember we went to this coffee shop in Panama, Matt and I. I remember taking a coffee and then I'm like, I need another one, and then I took the third one. By that time, I'm just like ... I was just like, okay, there's something wrong here because my body is telling me I want more, but I'm feeling like there's a cost here. It was a really interesting state.

Dave: I'm not convinced that's caffeine. That's mold. You drink a couple of molded coffee. You feel anxiety when you're done and then you feel tired and then you want to hit it with another one. I found when I drank normal coffee before I quit for five years, I would just need more and more and more because you'd drink it then you'd crash, whether it's a half hour, an hour, two hours later. You'd kind of, if I have more coffee I'm going to die.

Dave: When I started drinking it again and came up with the Bulletproof process and all that stuff, I don't get that anymore. After years, it's like the same two, three cups and it just doesn't creep up anymore. I truly think that if you're looking at adrenals and you're looking at magnesium, there's something called OTA, ochratoxin A, which is the primary mold toxin that people focus on in coffee. There are other ones present. OTA is a bladder and a kidney toxin that will cause the body to pull water out of your plasma. It will dehydrate you. It will cause you to wash minerals out because the kidney is where you're going to be doing this. You'll actually dump more magnesium if you're having more toxins present in your coffee, which is why I'm like ... When I travel, I bring my clean coffee. I brewed it myself in the hotel room. Actually, I didn't have to. Beverly Hilton Bulletproof Coffee cold brew in the room so I can drink one of those.

Dave: Almost always, even if I'm in China or Panama, I've got my little Bulletproof beans with me because I know how to handle it. I just got to say, watch out for toxins, red wine, and almost any grain has OTA in it at different levels depending on time of year, and that's going to increase magnesium dumping. If you are already stressed and you're taking coffee that might not have been the cleanest coffee and you're short in magnesium so you're doubling down on your dumping of magnesium.

Matt: Hundred percent.

Wade: And so, that's where it becomes a vicious cycle. This is the vicious cycle that happens. And so, fortunately, as you advocate is go get your labs done. Go get some experts in there. Find out what's going on because even if you're doing what a lot of things are right, there's always areas being a high performer and just kind of giving it all the time. We just have a burn rate that's higher and we're on that redline a lot more and you just have to be a little bit more careful.

Dave: What labs did you get done?

Wade: I did a SpectraCell Lab. We did Dutch test. We did home OIR. We did, let's see, genetic testing.

Dave: You went the whole-

Wade: We did everything.

Dave: ... \$5000 with the lab?

Wade: Yeah. We did. Yeah, I just did it all. It became pretty self-evident what was going on.

Dave: Most people listening don't have 5000 grand to drop labs. You can get your magnesium tested. You can get red blood cell magnesium and you got that. Did you get any other magnesium tests?

Matt: Well, just to jump in. It is very difficult to actually test magnesium because it tends to go into the tissues to the cells, so blood test for magnesium is probably one of the least effective blood test you can do compared to other minerals and test hormones and stuff.

Dave: I agree. You can't really know a good deficiency there.

Matt: But the biofeedback, which we'll get more into I think is a better indicator of your magnesium load in the body, which again if you're stressed out and we'll get into a bunch of studies late in the recording, there's definitely some correlation between anxiety and magnesium deficiency.

Dave: Oh, a huge one.

Wade: Yeah. The Mayo Clinic was talking about the long-term activation of the stress response and chronic overexposure to cortisol and other stress hormones. I was actually going to an extremely stressful business situation with a former partner of mine that was also driving the engine. But what they talked about puts you at increased risk of all bunch of health conditions including anxiety, depression, digestive health problems, headaches, heart disease, sleep problems, weight gain, memory and concentration impairment, and so much more.

Dave: This is chronic stress doing that?

Wade: Yeah. I'm not an anxious kind of guy.

Dave: No.

Wade: I was waking up feeling anxious and I was like, whoa, this has never ... I've never had that experience in my entire life and it was a shocking as they say come to Jesus moment. It was like, you need to pay attention and hear what's going on.

Dave: Something with biohacking that's just worth noting because you guys are long time biohackers and you come to the biohacking conference. This is a quote from one of my friends who went through a 40 Years of Zen. He's like, "Dave, with his Bulletproof stuff, you can move the wall out quite a lot but there still is a wall. Because it's moved out so far, you'll be going faster when you hit it."

Wade: That's a really good analogy.

Dave: Isn't it?

Wade: It really is.

Dave: This happens to a lot of people, but like I've never actually run at full speed before because you'd always set the wall before you got up to full speed. Managing your stress becomes more important if you're a high performer. This is something that is talked about a lot in the world of stress. You're going, "I'm so stressed. What am I going to do?" You're like, I'm an entrepreneur. I'm in good shape and kicking ass, but what's going on now? It's because you're kicking ass that you became more aware when you hit the wall.

Matt: I think the more ass you want to kick, the more you need to be concerned with recovery, rejuvenation. That's where a lot of the biohacking technologies come in. This is also where magnesium comes in, like I'm on the road right now for a 12-day trip. I went floating. I went to the labs. I did acupuncture. I'm loading up on magnesium. All these things will manage the stress. Traveling is stressful. Business is stressful. We need to be able to have a resilience and really we look at it from an athletic metaphor. Athletes, there's a direct correlation between the amount of training they can do and the recovery. If you're going to train really hard and achieve incredible performance, you need to recover really deep.

Matt: To me, an entrepreneur, we're like athletes for the mind if we look at just the way we push our brains. We push our nervous systems. It's the same thing. We need to make sure that we're recovering a lot of times.

Dave: You guys got really into magnesium, which is so tied to enzymes throughout the body and you're experts on enzymes. It's tied to our stress response specifically. I want to ask you about my favorite test for magnesium sufficiency. You take magnesium supplements and you take a normal dose. If they don't give you the runs, you take a double dose. You're deficient. If you take a triple dose, you're really deficient. You take a quadruple dose, you're really deficient. The world's first biofeedback is disaster pants.

Matt: Just to jump in on that, there are certain magnesiums that do pull in more waters than others.

Dave: That is true.

Matt: That is one thing. Yeah. We can get into I guess how we fix ourselves. There was a real convergence of three different people that told us about their magnesium protocol. One was Charles Poliquin at the Bulletproof Conference a couple years ago.

Dave: I actually dedicated Game Changers to Charles. He just passed.

Matt: He was a really special man.

Wade: What was fascinating about I remember that specific, which was one of the best talks I saw at that Bulletproof. It was just a wealth of information. Funny, when I went to this and we started looking and it triggered in my head, I remember that talk. He talked about the different types of magnesium that he would use for specific organs and also for specific athletes depending on what their drain was. There is different magnesiums for your heart, some for your brain, some for your muscles. I had never heard that level of differentiation and why he said it was one of the number one supplements that he used with all of his Olympic athletes. He had so many different gold medals. They're like 27 or 30, some ridiculous number of gold medals in different events.

Wade: I remember seeing it and I was like, I had never heard of that. Of course, interesting enough, wasn't that long after that I ran into that. It was kind of like my RIS picked up something that I discovered. Six months later, it's like we need to dive deep in this map and figure this whole thing out because I went out and started buying all these magnesiums. I found out, there's all different kinds of magnesiums and I started buying all of a sudden, I had this whole covered full of different magnesiums. I'm taking this for this, and this for this, and this for this. It got pretty complicated and we decided to go as deep as we could in this kind of endeavor.

Dave: Beautiful.

Matt: Charles talked about his protocol, which was no 2 to 5 grams of magnesium with 10 to 25 grams of fish oil a day. There seems to be a synergy between fish oil and magnesium,

which I think on a ... For us rebuilding the myelin sheath and healing the nervous system, there seems to be some really powerful synergies.

Matt: Also, Mercola talked about the same type of protocol, magnesium and fish oils to deal with the EMF. Then a good friend of ours, Clayton, he's not a publicly known figure, but he's probably one of the highest level of consciousness human beings we've ever met. One of the interesting things, there seems to be when your level of consciousness gets really up there if you've read David Hawkins' work, in the high 500s and beyond, that was a real ... It burns up the nervous system.

Matt: I've been to Zen five times, and a good friend of ours-

Dave: By the way, just if you're listening and you don't know Zen, 40 Years of Zen is a five-day intensive neurofeedback program, a company that I started and I use on my own brand. You've been there five times.

Matt: Going to six, soon.

Dave: Just for ... I know people who hear that go, what the heck is going to Zen.

Matt: Just go if you haven't, it's awesome. A good friend of ours, Tony, he has very high gamma waves. We saw that when he increases his gamma that his nervous system would kind of get frazzled like it's a very intense brainwave. It's a very fast rapid brainwave that seems to stress the nervous system. Even from a spiritual perspective, I think that when you're in really high level of consciousness that you're burning up a lot of magnesium. We've all heard the stories of Eckhart Tolle and David Hawkins that when they kind of had that huge leap that they were sitting on a park bench for three years of Hawkins moved to Sedona and sold manure for seven years. That's literally what he did.

Matt: It seems that there is a correlation between high level consciousness and burning magnesium, or just any stress response. It seems that gamma is very intense and it takes a while for the nervous system to adopt.

Dave: It takes huge amounts of energy to enter any of the altered states of high performance that our brains are capable of. You don't make ATP without magnesium. When I founded 40 Years of Zen, we have very advanced spiritual people who will just naturally come to the program and we'll help them tune it. There's a reason there's an executive chef there and a wall of supplements because I can't do that in five days for anyone's brain until they're fully tuned. If they're magnesium deficient, you simply won't make the same brainwaves you can make when your cells work.

Dave: You look at how fast can you run or how big of a brainwave can you make. It's the same thing. It's an electron. Did you have enough of them and could you direct them where you wanted to like a professional? That makes everything including being an Olympic athlete sound a little easier because number one, it's the energy production and number two is ability to focus the energy to do what you want.

- Dave: If you're missing this key thing and since magnesium is such a foundational element for everything, yeah, you're going to suck at meditation, you're going to suck at relaxing, you're going to suck at recovery and you're going to suck at running too if you're deficient in it.
- Matt: As far as getting it from food, it is difficult to find food with magnesium as you were alluding to the way food is farmed. There's not that much magnesium left in the soil compared to what it used to be. It's also difficult to absorb early to a certain degree. We do need in our opinion to supplement and supplement enough of it.
- Dave: Well, you didn't even have to say in your opinion. If you're of the mindset that, oh, I'm going to get all of my nutrients from food, I don't know what planet you're living on, but it's not this one, because there's two core things going on. Number one, food is depleted in minerals compared to what it was, the higher levels of CO2 cause food to have less minerals than it did before because it grows faster so it has less time to pull it out of the soil. If you only get your minerals from your foods clearly, you should only get your toxins and your stressors for mother nature as well.
- Dave: If you're living in the Garden of Eden but you could just drop your GPS coordinates, I'll drop another million people who are going to move there right after you and deplete your soil. No, if you're not taking supplements, you are doing it wrong and you are going to die of a degenerative disease sooner than if you don't. That is just the facts of life today.
- Matt: Hundred percent, and you're all transhumanist here to different degrees and supplements are like the first level of transhumanism. We're using science and technology.
- Dave: No, they're not. Blankets are the first transhumanist technology. We use them for technology to stay warm. Oh my god. We're all transhumanist because we're all constantly using technology to be better.
- Matt: Exactly. The supplements are part of that. We were all born to peak in our 20s and early 30s, and then start slowly degrading and dying. That's what I love about your book, Super Human. You've done a great job of basically laying out tools in a roadmap to extend our peak, extend our plan and hack this biological condition we're all born with, which is called aging and death.
- Dave: One of the things that we're all going to deal with and I would really first focus on reducing suffering before you die. That's that in Super Human. The first thing to do to live a long time is don't die. These four things that are likely to kill you and all of them are tied to chronic inflammation, which is tied to chronic stress and many of them are tied to deficiencies of one sort or another, including magnesium.
- Dave: Longtime listeners, people who have been following the blog for seven, eight years, if you go back and you look at the blog post, Top 10 Supplements to Live Longer, which is a very old post but it's still heavily trafficked. By the way, it's on daveasprey.com. I put a

lot of the original content that wasn't about coffee and collagen on just my own site with all my books and all that. If you guys haven't had a chance to check out daveasprey.com, you should hit it up. In that post, magnesium and vitamin D are the top two that are up there. Now at this point, I've added A and K as you have to take those with vitamin D. We didn't even know that eight years ago.

Dave: But magnesium is at the top. You guys have focused on getting the right form and to be super transparent about this, Bulletproof makes supplements. We have some great mitochondrial optimization stuff. There is no way that I'm going to make every supplement on the planet. My job is to find the cool stuff that works and to talk about it. If I make some stuff, great, but we don't magnesium because I feel like there's other magnesiums out there. There's many bottles of it. You guys have gone to the trouble of putting together a well thought through stack in the system that there is actually a market gap right now, so you just filled it.

Matt: Again, as Wade was alluding to, we were taking ... It was a lot of different pills. Let's just put it that way. There was a lot of different types of magnesium. What we decided to do is to combine them all in one pill, including the cofactor-

Dave: This isn't going to be one pill, one type of pill.

Matt: One type of pill.

Dave: Magnesium is a giant molecule and for people who don't like taking pills, here's the deal. There is no way if someone says you could have one a day. You cannot fit enough magnesium in one pill to be sufficient. Not to mention all the other stuff that allegedly is in your one pill a day so that's mostly decorative, the one pill a day thing. I simply don't believe in those. I really want them to be true, but until we have that Fred Flintstone, I may be dating myself, image where actually no, this is the Jeffersons, one of the first science fiction cartoons.

Matt: I love that.

Dave: Saying, I'm going to have a steak. The guy gets out a tiny little pill that sit on this giant plate and then cuts it with a knife and it turns into a steak. Until we can do that in a thing, your magnesium formula is not going to be one pill.

Matt: No, no. Let's say one pill, we just put all of the different magnesiums.

Dave: You can offer one bottle.

Matt: One bottle.

Dave: Okay, there we go.

Matt: Let's go through different magnesiums and what they do. First, there's magnesium chelate, which is really important for muscle building, recovery and health. For people

that work out, it's a great magnesium. Then there's magnesium citrate, which seems to help with obesity. One study found that this form really help with arterial stiffness in healthy overweight individuals and Wade, maybe you talk about-

Dave: What's in a healthy overweight individual?

Matt: I don't know. We have to ask the study, the guys who did the study.

Dave: It sounds like military intelligence.

Matt: A lot of oxymorons. Wade, when you talk about when you did the magnesium IVs and your theory around magnesium and calcium.

Wade: Yeah. It was really interesting. Of course, hey, let's biohack this. We've got a magnesium deficiency. I was in Bali, Indonesia and I had a naturopathic friend who was cool with giving me intravenous magnesium. We would go up to 20 grams, which is about the threshold dosage that you can do.

Dave: You'll get flushing from that. I do that as well.

Wade: You get a lot more than flushing. You get a lot of things. When you take that and I don't recommend starting at 20.

Dave: It can actually kill you.

Wade: Yeah. You kind of go up and you have a medical professional to monitor it. This is not something you do in your basement. You kind of bring it on. First off, there's a general relax sense that you have. I remember the first time and it was like, I just went to a level of chilled out. It was like, oh man, this is great. Then the next thing that happened was really fascinating, is muscles where I have kind of calcium deposits from 35 years of lifting heavy inanimate objects were literally starting to burn. I believe that the magnesium was starting to bond with the calcium and just dissolve these things. I would also feel it inside my brain as well, the calcium deposits in my brain. It feel like hot points inside my brain.

Dave: Why do you think those were not just mitochondrial activation?

Wade: Could have been.

Dave: Versus calcium.

Wade: It could have been, but for me what I noticed is afterwards, I had ... Because I did several treatments of this, I had improved rotation in my shoulders. I felt more flexible. I was seeing a difference where these adhesions had kind of broken down. Could very well been mitochondria in the brain. I mean just-

Dave: Or just a relaxation anti-inflammatory response. The reason I'm a little skeptical there is I don't have good data that says that these forms of magnesium are going to chelate calcium specifically. There is a calcium-magnesium ratio in the body that you need to maintain. Most of us have way too much calcium, which is I think you're about to go there with that, but I don't believe that magnesium by itself will go on and displace calcium in most of those bonds. I don't think there's enough energy to do that unless you guys have some data I don't have.

Wade: All this is anecdotal.

Dave: I think it's inflammation based, not calcium based but I could be wrong. Keep going.

Matt: The next one is magnesium bisglycinate or glycinate, pretty much the same thing. This one is used to treat different things such as upset stomach, heartburn. It's also really good for sleep. It's a good product to take before sleep. It will help induce quicker, faster sleep. Magnesium malate, which some people believe is the most bioavailable form. It could help with migraines, chronic pain and depression. Magnesium L-threonate, which is served at Zen, 40 Years of Zen. It's a really good one for the brain.

Dave: It's my favorite.

Matt: Yeah. That's really good.

Dave: I take it every night.

Wade: I really like that one.

Matt: Yup, short-term memory, long-term memory. Magnesium taurate, which is the best one for your heart. One study noted the complex magnesium taurate made does have considerable potential as a vascular protective supplement. Then finally magnesium orotate, which is helpful also for the heart, believed to be the best one for metabolic improvements. Again, it's another really good one for people that work out. The other thing too is cofactors, so B6, manganese. We've added monoatomic element, some humic, fulvic minerals to help the absorption because again, magnesium doesn't exist in a vacuum.

Matt: That's what we've put together. We can get into a bunch of different studies. Wade, when you talk about the protocol that you did to heal your nervous system and your brain and your whole stress response-

Dave: Before we do that protocol, I want to comment on your list here. You hit chelate and then we've got citrate, bisglycinate, malate, threonate, taurate and orotate.

Matt: Correct.

Dave: People ask me all the time, "Dave, what kind magnesium should I take?" My answer is you want as many of the ones that end in -ate as you can get. You guys have all of them

including the rarest one probably. Most people don't understand orotate at all. People who are fans of Bulletproof supplements know that I make zinc and copper orotate formula, because orotate absorbs very differently and better than a lot of other forms.

Dave: The fact that you guys got that obscure form orotate in there is I think really noteworthy that this is a really complete formula. I can tell you I have not found in the entire time I've been using supplements, 25 plus years, a single formula that has all these in it. This is beautiful.

Matt: That's why we did it.

Dave: It's time-saving.

Matt: Our philosophy at BiOptimizers is either we're the first in class, meaning we're the first guys to produce this type of product or the best in class. With magnesium, we just felt there was an opportunity to create something superior.

Dave: Yup. There isn't a product like this I've ever found. To get all seven forms of it in a pill or in a handful of pills, how many did you take by the way?

Matt: Well, it's good to the dosage. In our opinion, especially again if you're fried and a little burnt out, doing a 90-day loading phase, probably starting with a gram a day to 2 grams to 3 grams. Because if you step up, what we found is that your gut biome won't get ... You will get disaster pants. If you just jump right to like 4, 5 grams a day.

Dave: You're not going to like your life.

Matt: Yeah. You might have some challenge-

Wade: In divided dosages is better as well. For me, when I started that whole routine, I started at 2 grams and then I scaled right up to six before I got any.

Dave: You were deficient, wow.

Wade: Yeah, really bad. I did that and I a gram in the morning and then another gram later in the day, another one in ... It literally took 6 grams for me to start. That's when I hit. And so, just using like what they did in orthomolecular nutrition with Hoffer and Pauling and all those guys, I believe that one of the biohacks that I've always been into is take up to the point where you hit tolerance and then titrate down. Then if you get the runs again, then you titrate down again. And so for me, it took a few months. We went from six and then it down to five, and then now I still take 3 grams a day with no side effects other than I feel great and I feel relaxed. I could now have coffee again. We can have a coffee event.

Wade: Last time, we stop around the show. I wasn't having coffee because I was in the middle of that recovery cycle. Now, just a few weeks ago, I actually got to have my first coffee and didn't have any of the negative responses and stuff.

Dave: Felt normal.

Wade: And so that was great.

Matt: Been able to go to drinking coffee daily again and have no issues. Yeah, I think magnesium ... Just sure now anecdotal story of what I experience, I got to a point where I was literally in a Zen mode, like all the time. My nervous system had so much magnesium that like literally, I hit a level of Zen and chill that I'll probably never hit and it was kind of like all the time, which was interesting.

Dave: Do you guys worry about disrupting the calcium-magnesium ratio? I mean, you need two calciums for every one magnesium. I mean, most people they're way calcified. There's free calcium floating around. The EMFs make it way worse. If you're supplementing 6 grams a day for long periods of time, are you going to go upside down and actually be calcium deficient?

Wade: There's a possibility and that's why you got to run your labs regularly and pay attention to what's going on. Check your bone density test. You have some tests and what's interesting is that was another thing on the DEXA scan, my bone density actually went up. It a 3% increase and I have high bone density as it is because I've been lifting weights for so long.

Wade: And so, the practitioner in Vancouver, Canada was like, "Wow, we don't usually see that in middle age man, their bone density going up unless they're doing something different." I can see someone who was untrained moving into maybe one of your bone density training programs or something like that, but I was of-

Dave: You're already in great shape, you should have dense bones.

Wade: Yeah.

Dave: Yeah. Magnesium is part of the matrix in the bones. It makes total sense if you're deficient, your body is going to take it out of the bones for metabolic processes. There's this amazing graceful degradation. In the body, there's a distributed system that has a list of most important for survival processes, and it's that stack rank list. And so, if there's only enough magnesium, it goes in the first one. If there's enough, it goes to the second and then if there's enough, it goes to the third. It's not evenly spread across these things. It's a very elegant well-controlled system. We don't know that entire list, but your body knows and it does that calculation the same way that a distributed system does. That there isn't like one master thing in your brain going, I know the list. It's like having a quadrillion little computers working at once on solving the problem and what comes out is the stack rank list.

Matt: Your body is very smart and has this massive supply of calcium in the bone and we can grab calcium as needed. In one of the ways we know that is when people drink like lemon water, which is super acidic. If you do a pH test, your pH test goes up.

Dave: If I was alkaline, it says it's alkaline. It's right there on the bottle.

Matt: Yeah, which you if you understand science, we understand what's happening, your body is using buffers and calcium from the bone and other parts of the body to buffer the acid. As far as being concerned, I think, what Wade said as far as doing a DEXA scan is probably the best way to make sure that your bone density is not going down. Again, we have this massive supply of calcium in the body so we're not too concerned.

Dave: It's not something, especially if you're taking your vitamin D and your vitamin K, it's not something that I worry about too much. I do think it's worth talking about. I don't believe you can do really bad things, except for diarrhea if you're taking it orally. There are a few cases usually parents who are giving kids enemas with magnesium sulfate or Epsom salts, you can die. You can actually disrupt electroactivity in the cells from too much intravenous or rectal, but probably not oral, not that I'm aware of.

Dave: The doses we're talking about here are not those kinds of doses. If you're soaking in a flotation tank like the one I've got at home, you're unlikely to do that unless you pickle yourself for 72 hours of straight floating without drinking anything. These are relatively safe in the overall scheme of all the things you could do including eating your 16 bowls of kale I would say is worse than overdosing on magnesium. I just wanted to call that out there just because magnesium is good for you.

Dave: If you were to only take magnesium and be calcium deficient for a very, very long period of time or you're to do a dose that gets past the gut via some other technology, there could be risks, but man, if we worry about that, let's talk about potassium. That stuff will kill you way faster than magnesium. I think this is one of those things where pushing it, you'll know when you push it too far because your gut is going to tell you. I think this is a nice, safe and very important supplement for people to take.

Matt: Yeah. We can talk about what the benefits are, like what can you expect from it. What's amazing with magnesium we know it's involved in 300 different metabolic processes. We really see improvements on just about every part of the body, starting with even blood sugar. It helps move blood sugar into your muscles and dispose of lactate which can help build up during exercise and cause pain, so you can see an exercise performance on that component. We've seen improvements with athletes, elderly. We've seen volleyball players be able to improve their jumping and arm movement. We've seen athletes who were cycling and swimming improve their performance. They also had reductions in insulin and stress response. Magnesium can help with the fat loss. Again, it's not a fat loss supplement, but it can really help.

Dave: Well, if you make more ATP, if your body is better at turning food into energy, magically, you're going to accumulate less fat. It's just how it works.

Matt: Of course, one of probably the biggest ones is around mood. Low levels have been linked to increase risk of depression. It's also been shown to reduce symptoms of depression and the result sometimes could be really dramatic. It's also been used and to

be as effective as antidepressant drugs and only 450 milligrams with different people who suffer from depression.

Matt: From all these different aspects, this was incredible. Even diabetes who once they fall more than 4000 people for 20 years and found those with the highest magnesium levels were 47% less likely to develop diabetes. People with type 2 diabetes taking high doses of magnesium each day experience significant improvement in blood sugar and hemoglobin A1c levels compared to a control group. Even blood pressure has been improved. We have seen improvements in CRP and other inflammatory markers, migraines. Like I said, it almost improves just about every part of your physiology.

Dave: All of those reasons are why it is the number one on my list of things you've got to take, just not even to live forever, but just to function really well. Some of the things that you haven't mentioned though that I think are most noteworthy is just muscle cramps. I used to wake up as a kid and I've had these horrible painful cramps in my calves. It was like someone had just kicked me. I didn't know what to do about it so I try to go back to sleep. It was real pain.

Dave: It turns out while I'm living in a basement that has toxic mold, which causes all sorts of mineral dumping, so I was already deficient and it puts a load on the kidneys and I wasn't taking magnesium. I just thought this was a normal thing that happen when you slept. I haven't had a leg cramp in 20 years because I take my magnesium.

Wade: Brings up something too because when I was going through the stressful period, it turns out I was living in a building that had mold, dealing with the thing. I had moved to that building and I had been in a pretty optimal space before and didn't do the mold testing before I went in there. Then all of a sudden, I think that might've been a contributing factor to the dumping of the magnesium.

Dave: It makes so much sense, just the whole stress response. The amount of stress you can handle if you live in a moldy environment or work in one, it's 10% of what you could normally have. You guys have probably seen Moldy Movie, the documentary on this. Moldymovie.com, it's free. You can just go watch it. You guys should go watch this movie. It's one hour. There's a dozen experts and people like us who are high performing people, including husband and wife, couple who are both doctors who moved into a moldy house. This is affecting 100 million structures in the US right now.

Wade: Wow.

Dave: Yeah. If you live in mold, you're going to need your magnesium. If you don't live in mold, you're going to need your magnesium. Now, it makes a lot more sense. You're running at your top speed. You're an entrepreneur. You're in a stressful situation. Then the biological and environmental stress gets dumped in on top of that, and the systems all go haywire.

Wade: Yeah. It was a perfect storm.

Dave: Yeah.

Matt: Speaking of stress, we know that stress can lead to elevated levels of cortisol, which can lead to belly fat. As we were doing research for this product, we found a really interesting study that was done in 2015, that found that one stressful event can lower your metabolism. They found that women were burning 104 fewer calories in a seven-hour period.

Dave: This is what kind of stress, like emotional stress?

Matt: Yeah, any type of stressful event.

Dave: Like lifting weights?

Matt: Probably, maybe, I don't know. That's an interesting question. I mean, obviously we know that lifting weights will increase metabolism.

Dave: It's also a stressor. Any heavy exercise is a stressor. Any virus is a stressor. A fight with your boyfriend, husband, wife, whatever is-

Wade: I think one of the interesting things today is the stress that we're getting today is not coming from what our biological systems. It's not a sabertooth tiger tearing us. It's not like another tribe trying to kill us. They're often what I call psychic stresses because of this extension into this whole digital realm. I think what's interesting is right now our definition of how we want to live or how humans have lived in the past doesn't really apply to the way the world is today and how we respond to that. That's why I think biohacking is becoming so prevalent with high performers is because they understand that we are not living in the world of grandma and grandpa. We are being subjected to so much more information, so much more where we're making decision. You see thousands of advertisements you're making decisions. You're reading thousands of different messages that are coming on your computer, and there can be responses to that that normally we'd be actually physically moving and doing something but here, we're just sitting here at our desk or doing whatever. I think that's like the real killer too. We don't have those natural mechanisms of movement.

Dave: There's a new recent study that's make the rounds in media where they're talking about people under 25 and the prevalence of anxiety like diagnosable anxiety and depression. It's almost half of them and it's because we have these ancient threat detection systems looking for tigers. When you're young, you haven't developed the wisdom and the resilience that comes from realizing oh those aren't tigers on Facebook.

Dave: Because it feels like it's a tiger, someone criticize you when you're 15 or when you're 20. I think that's why biohacking is taking off so much with people who are under 25 because they're saying, well, I don't like feeling this anxiety, this depression. I think even though my mom and dad might not take magnesium, I'm going to go take my magnesium. I'm going to change my sleep. I'm going to get an [inaudible 00:45:45]. I'm going to all the different things because it sucks to feel stressed all the time. People are

just saying, "I don't want to do that anymore." Certainly, that was what drove me as a beginning, I didn't want to be fat. I didn't want to be in pain. I didn't want to be stressed and act like a jerk all the time.

Dave: I feel like it's becoming more of interest to younger people, which is also surprising because the data that I have from people who bought Super Human. This is a book on how to live 180. It doesn't matter how old you are, you start applying it. It's just easier to do it when you're young and it costs less. The number of people who were saying I'm interested. If you went back 20 years, you're going to say, no one under 40 would've touched a book like that. But now, it's actually become of interest because people are saying, "I don't want this kind of crap anymore, like I'm done with it."

Dave: I think you guys are going to find there's a lot of people who are saying, I'm 24 and I decided to invest in magnesium or any of these other biohacking things or they're already drinking Bulletproof Coffee. They're saying the things that give me more return on what I put in so if I spend a dollar on whatever food, whatever technology, whatever supplement, did I get way more than a dollar's worth of energy and sensation from it? We're starting to wake up. It doesn't really matter how it tastes if it makes you feel like crap. That was 1970s thinking.

Dave: Now, it better make me feel good and it better taste good. From supplement, well, yeah, I better be able to take it and feel a difference or maybe I don't want to take it because I have limited budget and limited time and most people aren't going to swallow 150 supplements a day like I do. If you guys are up to that number, I bet you're pretty close to work.

Wade: We're in. That's part of our job as thought leaders in the industry is like we need to push the envelope so we need to rev the engines and find out what goes around and then kind of report back for people in America that's kind of our responsibility and why we do what we do.

Wade: I mean, I'm hardwired this way. You're hardwired this much. We're all hardwired to keep moving the evolutionary chain I think and sometimes you hit the curb and learn. Sometimes you crash and burn. The good news is, is the technology is now present to rebuild ourselves. We're all living kind of The Six Million Dollar Man dream, if you remember that movie back in the day. We have the technology and here we are right here in Beverly Hills where yeah, guess what, you can come in to the labs, get your testing, give us some stuff and start optimizing yourself for the new world because we are not living in the world of our ancestors.

Dave: I wonder how many people listening remember The Six Million Dollar Man. Are we dating ourselves?

Wade: We totally dating yourself, but you know I think it's okay.

Dave: Yeah. I'm in my 40s. By the way, I just celebrated earlier this week my 26% birthday.

Wade: That's great.

Dave: I'm doing it in percentages now. It incredibly changes.

Wade: That's awesome.

Dave: If you're not familiar with this, this was one of my favorite TV shows when I was under 10 probably and Lee Majors starred in it. It was this guy who gets in a horrible car accident so they spent \$6 million, which by the way, is the amount I made and lost in my 20s. They spent \$6 million upgrading and they put in these-

Wade: Which was a fantastic amount of money.

Dave: It was enough to rule the world. They replaced his skeleton way before they had Adamantine and Wolverine and every time he moved, they would make this like ...

Wade: The bionic sound.

Dave: That's a cool thing. Then two years later, they're like, where the bionic woman. Then she came out in her own series, and these were some of the first transhumanist TV shows that weren't some like weird sci-fi kind of things. Even back then, sci-fi was mostly spaceships. It wasn't like, oh, now we're half robots. This was very much thought leadership and way better than chips.

Matt: We really need ... We're basically using technology to combat technology if that make sense. We have all these destressors. Most people wake up the typical person wakes up. They go right pretty much into a fight or flight response and they pull up their phone and see if 20 alerts and go right into that.

Dave: I have a [crosstalk 00:49:40] response. If you wake up and like me, you leave your phone on airplane mode until your kids drop off, how many less of the capsules of magnesium do you have to take if you leave your phone on airplane mode for a while and you wake up?

Matt: Probably one.

Wade: Yeah.

Matt: But no, that's the way to do it. Of course, you've learned to manage your stress response and that's one of the big benefits of 40 Years of Zen. You really learn to control your brain and your brainwaves because beta brainwaves, which are pretty fast is pretty stressful state of mind to just live in all the time. Like I said, when people wake up, they go right into that. They stay in that all day. Then once they're exhausted, they pass out and then they wake up and repeat.

Matt: They're in a kind of constant low-level fight or flight. One of the things we want to as human beings as biohackers is modulate and manage our nervous system. That's where

magnesium comes in. It's one of the best tools to combat that and spend a little more time in parasympathetic, which is kind of the healing side of the nervous system.

Dave: It's a tough challenge. If you look at it, on one hand, if you're in beta, that's for sports performances, if we're running away from a tiger.

Matt: It's for businesses.

Dave: It's for a fight, right?

Matt: Mm-hmm (affirmative).

Dave: Now, there's the relax and alert sort of alpha state where you can go to bed if you need to but you're aware and you're paying attention. A lot of the targeting of what we're training at 40 Years of Zen is alpha but that's not all it is. Then if you've had too much chronic stress or specifically traumas when you were younger or even just a car accident when you're older, it can kick you into this daydreaming theta state.

Dave: I see a lot of people come in and they're so stressed that they can't come out of a daydream and you look at their brainwaves. They're sort floaty a lot. They are less able to function in the world. If you kick them, they'll go into beta, but then they'll drop right down into theta. They're kind of just sort of floating through life. They don't want to be doing that, but it's a combination of low energy. They don't have enough energy to kick themselves up and it's a combination of trauma. Whatever energy they have is driving them to look for tigers that aren't tigers, so they just sort of ... Their nervous system kind of gives up.

Dave: I firmly believe that when you get yourself a notation stack right, your energy levels go up and you can pull yourself out of that floaty daydream state, which by the way is my default mode as a young person. Then it would be either like daydream or fight, daydream or fight. And so, that path of evolution is to teach yourself to be able to go to the daydreamy state, which is where creativity and intuition happen to be able to function where you can look there and go into a beta state when you need to.

Dave: Generally, be alert and relax and functioning. You will not do that if you have lots of toxins in your body or you have basic mineral deficiencies because your body can't make the energy to do it. It makes so much sense. It's just rational western science cause-effect stuff like that. That's why you fix your body. You fix your biology. Then you do your personal development work. I'm going to go meditate and I can't make electrons meditate, you're kind of wasting your time. I think you guys just hit the first one.

Wade: I would call magnesium the master mineral really. It's a precursor to so many different reactions inside the body that it just augments so many different functions that I think when people take it, they start to feel it, especially if they're taking a properly balanced when we're getting all the ones because people don't know they might be specifically deficient in the magnesium in their heart or their magnesium in their brain and so, they

could take a magnesium supplement kind of a standard one and not get the specific magnesium they need for their particular body and how they're draining their reserves.

Dave: Well, I appreciate you guys coming in and sponsoring today's episode. Just your full disclosure here, I have been on magnesium for 20 plus years. It's one of my must-have minerals. I take it every morning and I take it every night. I have been unable to find a form that has all of the stuff in it that you guys have in here, which is why I'm super happy to support your form. What are you calling your new form? I have the beta bottle of it.

Matt: It's called Magnesium Breakthrough.

Dave: Magnesium Breakthrough.

Matt: We have a very special deal for all the listeners. If you go to magbreakthrough.com/dave, you will get a 10% discount code. The discount code is Dave10, so mag, M-A-G, breakthrough dot com forward slash Dave. Anything the discount code is already automatically applied.

Dave: They could go slash Dave, and you guys auto apply it.

Matt: Slash Dave.

Dave: Here's the deal. You guys really should be taking magnesium. I recommend this form. It's got all of the forms in it that I know about. That is likely to work better than just taking one form or two forms. I've right now before this product, I would open five bottles. I've never posted a picture because I don't want people copying exactly what I take because as a former 300 pound with autoimmune disease as a kid and mold exposure and all that stuff, most people who copied what I do that's been customized for me would not like the way they felt. It's more about here's how to customize your own.

Dave: Magnesium has to be in your stack for pretty much ... I can't think of a person who shouldn't be on magnesium unless there's some weird kidney thing going on. You've got to do this and this is a superior way to get magnesium than anything else I can think of. The other two ways that are of benefit that you don't have in here, one is you can spray magnesium oil, which is magnesium chloride on your skin. It'll absorb. You can soak in Epsom salts. Both of those are a little bit less convenient for travel and at home, and they won't do everything that's in Magnesium Breakthrough. Just a logical guy, this is good stuff.

Matt: Yeah. Finally, because I've tried the sprays for a long time. I just couldn't spray enough to get the benefit.

Dave: I get a rash sometimes. You have to cover yourself is this oily stuff. It's also possible to use magnesium chloride as a supplement. You didn't put in here, which is a good thing

because too much magnesium chloride orally can kill you, just like too much potassium chloride. Those are forms that are best topical.

Dave: I think this is well formulated. It's necessary. I'm happy that you came out for the show. Thanks for giving listeners a discount. Go to magbreakthrough.com/DAVE. Enter coupon code DAVE10 to get 10% off your purchase.

Matt: Mm-hmm (affirmative).

Dave: Thanks guys. I'm not going to ask you my normal questions because you both already answered them before. We know that you think you're going to live longer than me and we've agreed that we're going to wrestle when we're 186 [inaudible 00:56:10]. Have an awesome day.

Dave: If you guys like to show, you learn some new stuff about magnesium, do me a favor. Go get some magnesium. This is good stuff. If you decide I don't want to get the stuff. That's fine. Get some magnesium of some sort and it's fine. All I can tell you is you're not getting it from some goddamn beans or kale or anything else when you get these so-called nutrition experts saying, eat these whatevers because they're packed with so and so. No, they're not. Only if the soil is packed with it and the soil will only be packed with it if animals crapped on the soil. These damn vegans keep taking animal poop away from my vegetables. I don't know what to do about that. All I know is there's no magnesium in your food to speak of. You have no idea how much is in the head of cauliflower or broccoli today versus yesterday. You must supplement not just with magnesium but with all of minerals or you're not going to like your life and this is the best way that I know of to get your magnesium.