

Dave Asprey:

Many people in the bio-hacking community have had trouble with how much they overpay their life insurance provider, because these companies haven't caught up with new scientific studies that have changed the way different diet types and exercise are viewed by the scientific community.

For example, people who are committed to the Bulletproof diet may have an increased level of a good kind of cholesterol, called HDL, but some life insurance companies lump all cholesterol under one negative category, like they were created in the 1950s. Oh wait, that's 'cause they were. A decision like this can greatly increase what you would pay for life insurance.

Well, Health IQ is a company that's decided to change that. Health IQ advocates for a health-conscious lifestyle. They've used science and data to fight for lower rates on life insurance for health-conscious people, including cyclists, runners, vegans, and vegetarians, weight lifters and other people who are on diets that actually make them feel better, perform better, and live longer.

In fact, research has shown that people with a high health IQ are 42% less likely to be obese and have a 57% lower risk of early death. Many people don't even know their health IQ, let alone realize they can get a lower rate due to having a high health IQ.

Health IQ has special rates on life insurance for the health-conscious, and right now, Bulletproof listeners can learn more and get a free life insurance quote by going to [healthiq.com/bulletproof](http://healthiq.com/bulletproof). That's [healthiq.com/bulletproof](http://healthiq.com/bulletproof), to learn more about life insurance for people who care about their health.

Speaker 2:

Bulletproof Radio, a state of high performance.

Dave Asprey:

You're listening to Bulletproof Radio, with Dave Asprey. Today's cool fact of the day is about mitochondria. Many people think that we get about 50% of our genetics from our mothers and 50% from our fathers, but you're actually more related to your mom than to your dad.

That's because when you're conceived, the egg and sperm each have mitochondria, but mitochondria are the part of the cell, which takes in nutrients and breaks them down, and creates energy-rich molecules for your cells. They're basically the batteries or the power plants for your cells, and your mitochondria come exclusively from your mom. If your mitochondria stop working, even for just about six seconds, you die, because those mitochondria are that active. They're constantly recycling this energy for you. It's kind of like what happens when your iPhone is down at your 1% charge. As soon as you lose that last percent, you're gone.

Since we're talking about things like mitochondria today, I would be remiss if I didn't mention Headstrong, the new book that I've spent a long time writing. Started hacking my mitochondria, oh gee, 17, 18 years ago, when I realized I was having major brain fog, I was fat, and having energy issues, and every one of the therapies that's been most effective, every one of the bio-hacks that increase the level of performance, when you really dig in, like an onion, just peel off the layers, right at the very core, it's always mitochondrial.

So in this new book, there's stuff that no one's seen, about what's controlling your mitochondria. We've learned, thanks to 40 years of relentless research from a university researcher, who's covered in the book, that, pretty much, your mitochondria are the gateway to how your body interacts with the environment around you.

Epigenetics, the idea that the world around you changes your DNA. It changes them through the influence of mitochondria. So these little things that used to be bacteria are actually in charge, and Headstrong, which you can get at [orderheadstrong.com](http://orderheadstrong.com), if you order before April 4th of 2017, I'll actually give you the first chapter for free, and you can get a coupon for the Bulletproof store, and a bunch of other freebies. So, check out Headstrong.

That was a cool fact about mitochondria. Today's guest is someone that you know and love, if you're a long-time listener. It is none other than Dr. Mark, the medical director for Bulletproof, and the head of our coaching program. So if you go to ... Mark, what's our Bulletproof coaching URL?

Dr. Mark : [It's bulletprooftraininginstitute.com](http://bulletprooftraininginstitute.com).

Dave Asprey: There you go, [bulletprooftraininginstitute.com](http://bulletprooftraininginstitute.com), and as soon as you go there, you're instantly upgraded to a very posh British accent, just like Dr. Mark. It's a free upgrade that happens. All right, maybe not.

Dr Mark and I are friends. We've collaborated on the creation of the Bulletproof coaching program, which now has about 500+ students.

Dr. Mark : That's right.

Dave Asprey: And hundreds of graduates, and these are people who go out and take these Bulletproof ideas that say, "The human body is a system, and it interacts with the world around us. There's things you do inside your head, inside your heart, and things you do biologically, with what you put on your plate. When you stack all that together in just the right way, you can do amazing things. You can actually teach clients how to do it."

Mark also is someone who I, when we're doing Q&A from listeners, where Mark and I just chat about this, because he has a medical perspective on this, and I have a bio-hacker perspective. So you'll always learn really cool stuff on the

show. These are some of my favorite episodes, even though we don't have a traditional guest. It's always sort of like, I interview Mark, he interviews me. So, welcome to the show.

Dr. Mark : Thank you.

Dave Asprey: All right, Mark. How are we doing this? Are you reading the questions? Am I reading the questions? How did we decide to do that this time?

Dr. Mark : I'll read the questions, if you want. Shall we do that?

Dave Asprey: All right. Yeah, okay. Why don't you read the questions and I'll answer, then you answer, and we'll do what we always do. People who listen to us regularly know these are kind of special shows where you learn a lot about a lot of stuff. All right, let's roll.

Dr. Mark : Okay, actually, before we do our first question, Dave, I want to talk a little bit about mitochondria, because something that hardly anyone realizes is that at a biological level, we are fundamentally mitochondria.

Dave Asprey: You and I are in agreement there.

Dr. Mark : It sounds like a crazy thing, right? It's like, people go, "Well, aren't we human? Don't we have like 60 trillion human cells?" Well, actually, we have over a quadrillion mitochondria within those cells. One of the themes that we're gonna bring into this question and answer today, is to keep relating it back to mitochondria. Because, what we're starting to realize is, that if you really care about your performance, if you care about your energy, you care about your health, then you need to know about mitochondria.

Dave Asprey: In fact, if you think about it, we have this great story, and if you fast-forward, fast-reverse, whatever you call that, back to high school biology, "oh yeah, many hundreds of millions, or billions, of years ago, we harnessed some little bacteria, which became our mitochondria." They actually were little reddish-colored bacteria at one point in evolution. "And, we used them for energy." Now, the flip-side of that would be, "Many millions of years ago, mitochondria saw our cells, and were like, 'Oh, petri dishes! Let's colonize those and take 'em over!'"

And to this day, when people read the Bulletproof Diet, or they hear me talking about the three behaviors that everyone has, the Labrador brain behaviors, these are bacteria behaviors. This is the operating system for a bacteria to be alive, and it's easy. Eat everything, so you don't starve. Run away from or kill everything, so it doesn't eat you, and so that you can reproduce, and the third one is, make sure you have sex with everything else, so that you can reproduce the species. That's all you do to become a bio-film. That's how stuff floating in the ocean, or the stuff growing, frankly, in the bottom of your trash can, it

doesn't matter, that's what bacteria do to stay alive, and that's what plants do. That's what everything alive does.

That's what you do, too. All of the behaviors that you don't like come from one of those three things. Like, find something that you've done that you're ashamed of, that didn't come from your mitochondria. It always comes from those core urges, and our job as humans is to be able to be aware of those urges and to have control of them.

In some of the more advanced work that we do, both in the coaching program and the new personal development series that we're running, as well as even at 40 Years of Zen, it's like, how do you reprogram the core behaviors that come from mitochondria so that they're less reactive? That's why Headstrong is such an important book, and that's why, in every question, we'll tie this right back to mitochondria.

So, thanks for cueing it up the right way, 'cause I was blown away. I always knew mitochondria mattered. I thought they were power plants. I didn't know they were in charge.

Dr. Mark : Yeah, and it's quite humbling, yeah? When you realize so much of our unconscious behavior and the way we feel, the way we show up in life, the way we relate, the things we think, are influenced by these primitive organs situated in our cell. So it's time we started paying a little bit more respect to mitochondria.

Dave Asprey: Just understanding they're about 10% of your body weight, which is not that much, but they make 600 pounds of ATP every day, from 50 grams of raw material. They just keep recycling it. It's like you have your iPhone, and its battery is fundamental. It doesn't work without the battery. Well, this is our battery, and it's looking all around, like, "What can I do now?" even though you don't know it's doing that. It's fascinating.

Dr. Mark : Really fascinating. I learned a lot from reading Headstrong as well. It's a significant contribution to the field of performance and health, so thank you for doing that.

Dave Asprey: Thanks for your kind comments, and I mentioned iPhones since we're getting going, and people like to hear the latest bio-hacks. Before we get into this first question, I'm gonna show off the back of my iPhone, 'cause it's cool. If you're watching on YouTube, you go to [Bulletproof.com/youtube](http://Bulletproof.com/youtube), we'll show you the channel.

But, check this thing out. It's a sensor from a company called Cardia, and it gets a hospital-grade EKG on the iPhone, any time you want. The first one's looked at by a doctor, but after that, it actually uses artificial intelligence to tell you if your EKG or your heart, basically if your heart's beating well. Normally it's for people

who have heart attacks and are at risk of things like that. I don't have any risk like that, I just like cool gadgets that monitor things. Plus, my iPhone looks kinda like a spaceship now, so it's kinda cool. But you literally put two fingers on the back of it, it takes 30 seconds and then it will take your EKG, send it up to the cloud.

In 2003, I designed the entire backend infrastructure for the first stick-on heart rate monitor, to solve exactly this problem. So that we could tell people, "You're about to have a heart attack. Go to the hospital now, because you have 48 hours before you're probably gonna die."

Well, now, there's a sensor. I'm not sure how much it costs, because I got it at the Peter Diamandis conference, but it's not terribly expensive. This is the kind of stuff that's completely cool for bio-hacking, because before, this was hidden data. By the way, guess what's powering your heart. Of course, it's mitochondria. You have a mitochondrial problem, your heart isn't going to be able to beat, and you actually will have a heart attack, if you don't have enough mitochondria energy in the heart. It's where the electricity comes from. This is measuring electrical output from mitochondria that is used by the heart.

So, it's fascinating, but even when we're talking about iPhones, there's a mitochondrial connection.

Dr. Mark :

Okay, let's start with our first question. This is from Rodney, aged 42, from the United States of America. "Dear Dave and Dr. Mark, over the last few years, I've had an increasingly hard time with keeping focused and clear-headed. I get brain fog, and my short-term memory isn't great. Caffeine helps, but it makes me anxious and jittery. What else can I do to help?"

So, when I read that question, what comes up immediately, is inflammation and mitochondrial dysfunction. Now, we need to explain what I mean by all of those. If we actually had Rodney with us, we'd be asking him a whole bunch of questions. I'd want to know this, and what's happened to your energy levels? Do you get forgetfulness? Do you get cravings? What's changed in your environment over the last couple of years? What are you surrounded by?

In a really simple, systematic way, to take a look at any health issue or any performance issue is to take a look at the environment around you and the way it's influencing you. Then your internal environment, your biology and psychology, and systematically go round it. So, for Rodney, I suspect what's going to be going on is that he's got inflammation. I'd love to know how his gut health is. Are you getting any bloating, any flatulence? Any kind of wind? That kind of stuff.

Now, I've got a whole bunch of ideas, as to how to go with this, but I just want to get your initial thoughts on this, Dave, from your perspective.

Dave Asprey:

I would also look at his age, because one of the variables there is time. 42 is an interesting period. Most people under age, well, not most, well, slightly most, 52% of people under age 40 have normal mitochondrial function. 48% of people have early-onset mitochondrial dysfunction, according to research in Headstrong.

So, he just crossed over 40, and pretty much everyone over age 40 has mitochondrial dysfunction. We call it aging, and one of the five theories of aging is that your mitochondrial function goes down. When you talk about inflammation, you always get inflammation when your mitochondria start leaking.

The idea is, a tight-running motor doesn't leak oil. All of the pressure from an explosion in the motor goes into powering the car forward, and then you get leaky valve seals. Eventually, some of the pressure goes into the engine, it doesn't go into the tires. An old car just doesn't drive like a new car. It doesn't have the same power curve. Every time your mitochondria leak these high-energy electrons, instead of putting them into the system, it creates inflammation directly. It's called reactive oxygen species, or free radicals.

Since the brain has the highest density of mitochondria, along with the eyes, which are an extension of the brain, the brain itself, and the heart, that's where the most energy per cell lives. When someone says, "I get brain fog and short-term memory problems" like that, I'm like, "What are the mitochondria in your brain doing?" And by extension, since mitochondria all talk to each other, what are the mitochondria in the rest of your body doing?

The answer is, you just crossed over from probably functioning mitochondria into the realm of, my mitochondria have started leaking. You're getting older. So what do we do to reverse that?

Dr. Mark :

Yeah, so what we need to do. To anyone who's listening to this, what I'm gonna share with you are the basic principles for tackling any issue like this. Apply it to your own life as well.

We want to basically start working out where Rodney's kryptonite is. Kryptonite is essentially anything that undermines your energy, your performance, the functioning of your mitochondria, the functioning of your brain. We have to take on the role of a detective to do that. We've got to be systematic about it.

So we can look to the environment surrounding ourselves. What kind of light are we being exposed to? Is it fluorescent light? Is it LED light? Are we getting enough sunlight? The air around us, is it full of negative ions? Is there air pollution in there? Is there mold in there? What kind of people am I surrounded by? Am I near to nature? What kind of water am I drinking? Is it chemically contaminated? What food am I bringing in?

One thing I see often with people who have brain fog, and many of my patients have brain fog issues, it correlates really closely to food sensitivities. I know that if I, personally, eat gluten or dairy or refined sugar, I'll have brain fog within a couple of hours, period. Some people have lectin sensitivity. Lectins are-

Dave Asprey: What are those?

Dr. Mark : There you go. What happens when you have lectins? Lectin is found in beans, and legumes, and grains, and nuts, and seeds. It creates this inflammation inside of your body. Lectins are just proteins that bind to carbohydrates. They're the immune defense system for plants. But we can't digest them, and when you're sensitive, they're creating some inflammatory cascade in the body. You can be getting along feeling fine, you have some lectins, and then, before you know it, you can't think properly. You're making bad decisions and you've become a pretty miserable person to be around. Then you're aging, and you're moody, and all this kind of stuff, and like, an hour or two previously, you were absolutely fine.

Dave Asprey: It's interesting, too, in that sensitivity is genetic. It comes down to the way your immune system is put together. It's not about allergy at all. This is about those plants developed a system to keep animals from eating them, and that system works against you, but your spouse, or the guest sitting across from you may be perfectly fine eating that plant. It's not that the plant is good or bad, it's that it's kryptonite for you. Most people eat the high-lectin foods every single day. Your normal state is not the same. There's at least three studies that I've cited in Headstrong, that talk about how lectins directly poison mitochondria, if you're sensitive to that kind of lectin.

The dysfunction of mitochondria happens because you ate bell peppers, or you ate potatoes, and you're sensitive to the lectin in that food, even though they're not bad foods for some people. So, for Rodney here, I would really want him to look at, what are you doing in the meals for 24 to 48 hours before you get the worst brain fog and short-term memory problems?

I also think that we would want to address blood flow in the brain. He's got to be getting, what I recommend in Headstrong, and what the data shows is, look, if you move for 20 minutes a day, and moving, go for just a normal walk. You don't have to take the stairs every day, although that might be good. You're not gonna be a better person if you take the stairs. I use the Bulletproof Vibe, usually that's my primary form of movement, especially when I've got two feet of snow on the ground like I do right now. It's not that convenient to go for a walk in it.

The other thing that could make a really big difference is, in the last three years, most people have added LED lights to their house, and the brightness of TVs, and the brightness of phones and all, it's gone crazy. I remember I got my first Mac, the first time I got a job at a venture capitalist firm. This was almost 10

years ago. I'd wanted to work at a VC since I was 12 years old. I was like, "A venture capitalist? How fun, you get to see all these companies, and you get to help these people who are doing all these things."

I bought a new Mac, and I would sit in this fluorescent-lit room, staring at a super-bright, white screen, and by 11 in the morning, I felt like such a zombie, and I couldn't figure it out. I'd go outside for a little while, and I'd let my eyes relax. I'd look at the Sun, and I'd go back in. It was draining to me. What I figured out, after a couple of years of this, was that the new bright LED illumination in laptop screens that they'd just added to the Macs, it was affecting my brain.

The eyes have mitochondria that gets stressed. A new study just found a 23% reduction in mitochondrial function in the macula, after exposure to these bright white screens. That's a lot. You're gonna get macular degeneration if you stare at a fully illuminated, any kind of modern thing.

Even the TV, I have a new Sony big-screen TV, and it's so bright that the kids and Dr. Lana and I, we look at that, especially evening, and it knocks us out. We actually have to turn the brightness down, and change the color temperature, and it's because the mitochondria talk to each other.

We think we know how they talk to each other. We know they do talk. We don't know if it's chemical or, my guess is that they talk by shining photons at each other. These are little light molecules, they're called bio-photons. We know mitochondria are very light-sensitive, and we know they make light. So the idea that they make it and then they hear it is not that uncommon. We also know that, without complete darkness, that doesn't work.

So for Rodney, at night, when you go to sleep, you need to cover every LED in your bedroom, and you need to duct-tape your curtains to the window, or better yet, get a proper roll-down shade and curtains that cover it, so that when you open your eyes at night, there is no streetlight coming in. Because we've changed the spectrum of light, we have like the corn-syrup of lighting in streetlights, and your neighbors' lights, and outdoor lights, and if you don't get absolute darkness, you're going to get brain fog, and you're going to get short-term memory problems over time.

Just controlling that, less sugar, and more ketones, I think would make a huge difference. There's nothing wrong with looking at the writing I've done about nootropics and smart drugs, because, for me, for 20 years I've been taking smart drugs that support my brain. Aniracetam is my favorite one, which actually lets you get your short-term memory, they call it memory IO, the ability to get things in and out of memory.

I don't forget words ever, whereas before, even though I was a very successful executive in Silicon Valley, there were times when I just couldn't remember words, and it would drive me nuts. At this point in my life, even though I have a



very intense schedule, I'm back to back, I'm a New York Times best-selling author, I run a Webby Award-winning radio show, I'm CEO of a rapidly-growing venture-backed company, and I'm a dad who spends a lot of time with his kids, I'm all in, I don't forget words. They come effortlessly, and if I even forget one word in a day, it's a red flag and I say, "What did I just do? What changed?" because that is not a normal occurrence. Whereas before, dozens of times a day, it was a normal occurrence.

So for you, that's a sign and you've picked it up, Rodney, that something isn't right. You've got to figure out, what do you do so you have less of that, and more of that. That's your radar map, to tell you when you're doing better or doing worse.

Dr. Mark :

I just want to zoom out there, so for anyone listening to this, just bear this in mind as well. It's that, if you forget something, if you feel tired, or you get moody, or you inexplicably get angry, if you can't find the right word, if you can't hold your focus and get easily distracted, that is a symptom of an underlying disordered biology and psychology, and possibly environment as well. So what happens in society is, we just normalize it. We just say, "Okay, this is just me. Just kinda creeps on, right?" We're surrounded by others who are distracted and tired as well.

One thing you mention in your book, is "normal is your nemesis." That's a phrase that kinda stuck with me. Maybe we can talk a bit about that, because there's gonna be a lot of people listening to this, who have been tolerating essentially intolerable symptoms for a long time, thinking nothing of it. Yet, by making some adjustments to their internal environment, their external environment, not only can they resolve the symptoms, but they can actually feel really good.

Dave Asprey:

You can feel really good. The problem is, you don't know what really good feels like. Unless you're hospitalized or disabled, you probably think you're doing all right. This is our own ability to deceive ourselves.

I didn't know you were supposed to be able to walk without pain, because I was born duck-footed, believe it or not, and I learned to straighten that out. I had arthritis diagnosed in my knees when I was 14 years old. I have a screw in my right knee. When I was about 20-ish, somewhere in there, I finally got orthotics that worked. I walked across campus at the University of California in Santa Barbara, and I'm like, "Oh my God, I just walked across campus without pain!" I had no idea that was possible.

I played soccer at a high level for 13 years, and I'm like, "It's just supposed to hurt, so you just power through it." So for me, normal was, "This is just a state. It's not even a big deal." But it was completely abnormal.

So what our goal is, as bio-hackers, is "Do not be normal." Average is not what you want to be. You want to be way above average. You want to be abnormal. What that means is, is there something you don't like, even if you consider it to be normal? And in Rodney's case, he figured out, "I don't like it that I'm forgetting words. I don't like it that I'm getting tired." That's becoming normal for you, and now you're gonna reverse that, and you're gonna make it abnormal again.

Dr. Mark : That's it. On the medical front, for people out there with brain fog, medications are a very common cause of brain fog. If you're taking beta-blockers, anti-depressants, sleeping tablets. If you're on any-

Dave Asprey: Blood pressure meds.

Dr. Mark : Blood pressure meds. If you're on any medications and you're experiencing any symptoms, look at the side effects of the medications and start there. Because I've worked with quite a few people in the past, who have tried everything to improve their brain fog and attention, and it turns out, it's a side effect of their medication. So, that's really important.

If you're having a lot of alcohol, as well, you're taking illicit drugs, all that can affect your focus and attention. I always ask about gut health, because if you have small intestinal bacterial overgrowth, so you've got bad bacteria in the small intestine, you've got candida overgrowth, you've got any chronic infection or chronic viruses, you've got dental infections, gingivitis, inflammation of the gums, all of that generates inflammation, which shuts down mitochondrial energy production as well.

So, there's a lot to think about but basically you go through it systematically. You start with your external environment, then you look at your internal environment, and in Headstrong, Dave, you offer this four-step process, which I really like. Number one is, you stop doing the stuff that makes you weak.

Dave Asprey: It's easier that way.

Dr. Mark : It's easier that way, right? We always say, "Start with your kryptonite," because kryptonite trumps everything. You can be trying to do all the right things, take all the right supplements and stuff, but you start with your kryptonite. That's where your greatest gain and reward is. Then you talk about adding in energy, and maybe we can explain this a little bit more. Increasing efficiency of energy production and supply, and then strengthening mitochondria. That's a really nice framework for working with someone like Rodney.

I think we've touched on the kryptonite stuff, but what can we be doing about supporting energy and mitochondrial function?

Dave Asprey:

We talked about moving already, which is one of the things that causes you to grow new mitochondria. There's two types of, quote, exercise. One of them isn't really exercise, it's just moving. That's going for a walk. It doesn't do anything in terms of building muscle. It doesn't really create what we call hormetic change. So, once a week, you need to lift heavy stuff, and you need to do it really intensely, for 10 or 15 minutes. It's not that much work; it's very efficient in terms of time. You want to move every day, that's going to help.

Then, in the Bulletproof Diet, and certainly in Headstrong with the eating recommendation, getting enough polyphenols into your body really matters. Polyphenols are plant-based compounds that interact with light. They're antioxidants. They're from famous sources. Things like blueberries, any brightly-colored vegetable. Blue, purple, red, yellow, things like that.

The number one source of polyphenols in the American diet is coffee. In the diet in the UK, it's probably still coffee, but it may be tea. Tea is a much weaker source, but it's a different kind of polyphenol.

So, what I started doing, after I became more aware of this, was, my goal was to get two grams of polyphenols a day. If you eat a normal, high-vegetable diet, which actually isn't that normal, you're getting about a gram a day. I supplement my polyphenols, and I also drink two cups of Bulletproof, Bulletproof coffee, with the mold-free beans, 'cause it turns out these mold toxins I've been talking about, they're mito-toxins, they harm your mitochondrial function via several different pathways, so you don't want to do that.

But I also do three cups of Bulletproof Decaf, without the butter and the brain octane, because I have those with meals. The studies on coffee show that people who drink five cups a day, decaf or not, have lower all-cause mortality, and I believe the likely reason for that is these polyphenols.

So I've increased my consumption of coffee or tea. Your job, if you use either one of those, is don't put milk in your coffee or your tea. The reason is that milk sticks to the polyphenols so you can't use them. It takes away the benefits.

It's interesting. People in the UK drink so much tea, they should have a reduction in stomach cancer, but they don't get a reduction in stomach cancer because they have the habit of putting milk in their tea. If you change that habit, you can put butter in your tea the way the Tibetans do, or you could just drink it black, and you'll actually get more benefits from it that way.

Your goal is a big plate of vegetables, moderate amount of fruit, because fructose is bad for your mitochondria too, but some fruit's okay, and it does have polyphenols in it. Fruit for dessert is a better plan. When you put fat in your vegetables, say grass-fed butter, avocados, coconut oil, olive oil, things like that, the fat allows your body to absorb the polyphenols even better. So you

end up with a much more powerful you, to be perfectly honest, when you do this, and this over time will help with brain fog.

Dr. Mark :

That's great, and as you're saying that, Dave, other things are coming to mind now, and Rodney, if you're listening to this, just check in to see if this is true for you. Same for anyone who's got brain fog, focus issues, I want to know what's happening, stress-wise. Are you under a lot of stress? If you are, what you can be doing to attend to that, and obviously reduce it, manage it better.

I wonder what your hormones are doing, as well. You're aged 42, I want to know what your DHEA, your testosterone is. For my female clients, I'm always going to be interested in what's happening with progesterone, estrogen, pregnenolone.

Thyroid hormone is massive. If you have a low-functioning thyroid, and your thyroid levels are low, thyroid drives the ATP production process. It is essential; it's a powerful regulator of mitochondrial function. So, if you've got a low-functioning thyroid, and millions of Americans have, not only are you going to feel tired and depressed, not only are you gonna put weight on, but you're gonna have a hell of a problem trying to keep your focus, and you're going to experience brain fog.

All of these things we have to consider. That's why ideally, you work alongside a functional medicine-trained practitioner, who can do the testing for you. If you do the basics, and you don't get a substantial improvement, and you feel you're doing all the right things, then you've gotta work with a health professional who can do the testing as well.

Dave Asprey:

There's also something called MILI-brain fog, which stands for Mother-In-Law-Induced, and that's not really a medical term. Bottom line is, if you have family stress, whether it's your mother-in-law or not, or if it's any other sort of emotional stress, mitochondria pick up on emotional stress.

So, if you have a vague sense that you're going to die, or that the world's a bad, nasty place, mitochondria actually stop doing their repair cycles, and they start doing, "How do I have enough energy to run away, and kill things right now?" If you do that persistently and consistently over time, you do start to lose function in those things. So if you do have a lot of emotional stress in your life, that works.

And it actually leads us nicely to the question from Belinda, from Australia, who's 34. She's asking us, she says, "Dave and Mark, I've been anxious all my life. My mom is the same. I had some CBT a few years ago, which helped a little, but I'm keen to be rid of this, once and for all. Please help." What do you think there, Dr. Mark? I've got some ideas there, but you start.

Dr. Mark :

Loads of ideas, and most of my clinical experience is working with people with anxiety and depression, so a lot of suggestions here. First thing I want to invite

for you, Belinda, is to reframe this a little bit. I completely get you want to be free from it and rid of it, but that kind of going-to-war stance, actually what it does in the longer term, it creates a lot more stress and tension, because you're at war with your experience.

What I want to do is reframe it to, "not trying to get rid of this, but trying to identify what's gone awry in my biology, and psychology, and environment, to create this experience?" So we shift our energy from "I'm at war with this" to actually "well, we've got our detective hat on." Now, for someone who has long-standing anxiety, normally we think Generalized Anxiety Disorder, and that's disabling, it reduces quality of life.

One thing we have to check, and it's probably not relevant, is in some people with anxiety, it could be Post-Traumatic Stress Disorder. So, you don't give any information that suggests that is the case for you, but just for anyone listening to this, if your anxiety started after a traumatic event, you get flashbacks, you feel on edge all the time, you overreact emotionally, you avoid certain situations, then you think, PTSD. You've got to go down the working with a psychotherapist route, using MDR, brain-spotting.

Dave Asprey:

And remember, that's gonna feel normal. If you've had PTSD for most of your life, you're not going to see those responses, but the people around you will see them.

I say this from personal experience. I had PTSD, I was born with the umbilical cord wrapped around my neck. I had birth-related PTSD. I had no clue that I had it, or that it had any bearing on my behaviors or my personality, but I had very low-level beliefs, subconscious beliefs, that there was always something trying to kill me, because I was born into a world where my biology, my nervous system, was like, "Wow, there is something choking you, I guess this isn't a very nice place."

And if you carry that with you, it will be very hard to see, for you, but easy for the people around you, who care about you, to see.

Dr. Mark :

Absolutely, and I'm also gonna assume there's no medical cause, as well? So, your thyroid's been checked, there's no hyperthyroidism, you're not on any medications, so assuming all of that, then what can you do? Well, we start with your biology. Now, we know that if someone is hypoglycemic, they will become anxious, so we need to work on your diet. Maybe, Dave, you can speak to that, in a minute. But there's some very basic things you can do.

You can take supplements like L-Theanine. It increases the brain neurotransmitter GABA, which relaxes the brain, puts us into alpha-state. Add to that things like, passionflower, lemon balm, those kind of calming herbs, and add in magnesium. So what you do is, you're starting to take control of your hyper-aroused sympathetic nervous system. You're starting to calm it down.

Dave, in the book you talk about, and I was trying to say it the other night, the box-breath as a way of calming the nervous system, so I don't know if you want to mention a little bit more about that, and what the idea behind it is.

Dave Asprey:

Oh sure, and in fact, when people order Headstrong at [orderheadstrong.com](http://orderheadstrong.com), there's a few videos where I teach breathing, and I just recorded the video two days ago, on how to do box-breath, but I'll offer it here really quick.

Box-breath is something that's used by military special forces, in order to calm the nervous system, so when Belinda's feeling a specific anxiety, like, "Wow, I'm really feeling it right now," you stop, take a deep breath, and you breathe in for five seconds, through the nose, hold your breath for five seconds, breathe out slowly for five seconds, and then hold or just stop at the bottom, and leave the lungs empty for five seconds.

For most people, that five seconds of empty lungs is gonna trigger anxiety at first, and that's the body going "I don't have air, I'm gonna die!" And when you just sit with that, and then you take another slow breath, and you just keep repeating this five seconds on each side of the box, what happens is, the body learns it's not gonna die, and it becomes calm.

It's a really powerful way to turn off the state. There is a clue here, Mark, from Belinda. She says she's anxious her whole life, and her mom is the same. What that means is that you've learned to be anxious from your parent. We hand this off to our kids without meaning to. You're a little kid, learning how to respond to the world, and when you see anxiety in an adult, as their response to the world, you will feel that and you'll learn to model it.

There's some interesting stuff that happens, too. I didn't write about it in this book, but it's called meta anxiety. When you're anxious about being anxious, every time you feel anxious, it's like, "Oh no, I'm feeling anxious again! I'm gonna die!" And it actually doubles down. It's like an exponential worsening of this.

We also see this in people who have sleep deprivation. If you're not gonna get a good night's sleep, you could wake up and tell yourself, "Oh God, I didn't sleep well last night, I'm gonna die, it's gonna be a terrible day," and then your stress over not having enough sleep is worse than the biological effects of just not sleeping.

So when you realize, and you shift your thinking, this is very different than cognitive behavioral therapy, which is what worked a little bit for her. In cognitive behavioral therapy, you learn to feel the emotion and then think your way out of it, right? And sort of talk to yourself about that.

The problem with that is that thinking your way out of your emotions is biological intensive. It uses a lot of electrons made by mitochondria. So you take

X percent of your waking, focused effort and you start using that to put systems in place to manage the anxiety.

What Mark and I are talking about here, whenever possible, is to address core causes of the anxiety, and to reprogram that, with things like EMDR or brain-spotting, or neurofeedback, or heart-rate variability training, which it's only 100 bucks for a heart-rate variability device, in Australian bucks that may be like 107 or something, but still, it's relatively cheap.

I like the heart math device called Inner Balance, and all you do, 20 minutes a day, you breathe and make the light turn green. When you make the light turn green, you just owned your anxiety response. Instead of thinking your way outside of it, you felt your way out of it. Feelings happen before thoughts, so when you can change the way that you feel about these things, you'll find that it frees things up.

By the way, you're not alone, Belinda. I had anxiety like that. A lot of the very successful execs I've worked with, same thing. I'm like, "You have to do heart rate variability breathing, and it frees up huge amounts of energy." 'Cause all the cycles you went into, to try and counter your emotions with rationality, if the emotions just calm down, all that extra energy that you were using to try and control yourself is now free for you to do whatever you want. That's that changing the environment inside yourself.

And of course, there's a mitochondrial angle to this too. When you're less anxious, your mitochondria go into repair mode more than they go into fight-or-flight mode.

Dr. Mark :

I'm also gonna give you a couple of tools you can use as well. So, Dave, you mentioned about the almost, at one level, the futility, eventually, of just focusing on the cognitive level, to deal with something that is fundamentally experienced in the body, and is rooted in the emotions.

So here's a process I teach to all my patients. It's really simple. All you do is that, anytime you're stressed or caught up in anxiety, you take your attention off this story. There's a narrative that accompanies it. You turn your attention inside your body, and you locate where the stuck emotion is, or the tension or heaviness inside your body. It will be in your solar plexus, your chest, or in your throat the majority of the time.

Then here's what you do. You silently say to it, "I'm pleased you're here," and you breathe. And what happens, you shift from fighting this emotion, going into your head to escape it, to turning towards it, and opening up to it, and facing it. Then this is the real key bit. You then get a sense of where that trapped energy, 'cause that's just what anxiety is, is just trapped energy, you get a sense of where it wants to exit your body.

'Cause all energy wants to flow through your body. Does it want to come out your mouth? Down your arms or legs? Out of your head? And all you do is, you just patiently stay with it, get a sense of where it wants to exit, and you're gonna be blown away, 'cause what's gonna happen is, it's gonna start moving. It'll probably move up and out of your mouth.

And what happens is, you start allowing this energy to pour out of you. Then as the energy pours out, the anxiety comes out, that trapped energy no longer fuels the overthinking that perpetuates the anxiety. You've gone to some of the root source.

Now, here's another tool as well. It's called tension releasing exercise. We have built into our physiology, an innate process for shaking off stress and trauma. It's called neurogenic tremoring. Now, if you see a wild animal that has escaped being attacked, what will happen automatically is it will naturally and involuntarily start shaking. Then, about a minute later, it will continue its life as though nothing happened. It basically shakes it off. We all have that within us.

Now this process, tension releasing exercise, you can look up that on the internet. There's loads of videos on it.

Dave Asprey: I'll shoot a video about that. That's a good idea.

Dr. Mark : Yeah, it would be. I think that would be a really great service. It teaches you how to activate this natural tremoring, and I teach a little bit to my clients, a version of it. It just discharges all of this energy, allowing your nervous system to calm itself down, because right now, your nervous system is on high alert.

Everything we're suggesting here, calming the biology, restoring mitochondrial function, providing relaxing minerals and herbs, and discharging the trapped energy, coming out of unhelpful story, all of that will move you in the right direction, but here's the key. Sometimes, when we feel so anxious, it feels too much to do. We get overwhelmed, so start with one or two things first. Take it one day at a time. Chart your progress, in terms of your mood, your energy, your focus, and what people think about you, and you'll find you'll start heading in the right direction. You'll feel empowered, 'cause you're going to come to realize like, "Wow, I can massively influence the way I feel, according to how I work with my biology and my psychology. I'm in charge."

Dave Asprey: It's a powerful thing, and I believe the first time I came across this neurogenic tremoring thing was in the book called, *On Combat*, or *On Killing*, which is a very precise look at first responders. SWAT teams, firemen, people in the military, looking at what happens, measurably, in the nervous system when people are in these extreme situations.

Those books have changed the lives of literally tens of thousands of first responders, because they map out what happens. Strange thing, someone wet



themselves in fear, that's actually a biological response, and soldiers, before they go in, if they don't pee before combat, there's a good chance it'll happen. It happens for biological reasons.

One of the things that the author of that book, whose name I believe is... Is it Grossman? Is that? I 99% remember that. I talked about not forgetting things, but, remembering the names of authors of books isn't one of my strong spots. I believe it's like, Lieutenant Colonel Grossman, if I remember right. Anyhow, On Combat, and On Killing are the names of those books.

He writes about how wild animals do this, and how, when members of the military go into a really high-stress situation, that afterwards, they have to go exercise, or just the shaking thing can work, but sometimes they need to get on a treadmill for a little while, just to dump all of the adrenal hormones, and to just allow their body to calm down. And that if they don't do that, they're stuck in these extreme situations.

The kind of anxiety that Belinda's feeling is probably not that extreme, and probably isn't going to require a workout, just that shaking-it-off thing can be a really powerful releasing technique.

Dr. Mark : Great! Well, we hope that helps you, Belinda, and anyone else who also experiences anxiety. A lot of people experience anxiety, but there's so much you can do.

Dave Asprey: Well, Dr. Mark, I think we answered some really good questions. We covered a ton of things, both from mitochondria all the way to, how do you reprogram what's going on in your head, which will have an effect on the stress levels of the mitochondria.

Let's end this show here, and, for people listening, if you haven't had a chance to pre-order the book, Headstrong, you can pick it up online, you can go to your favorite bookseller, and if you get it before April 4th, you get access to a bunch of bonuses, including a really valuable coupon, on the Bulletproof store, which almost pays for the book, in an of itself.

So I'd invite you to check it out. If this show's been helpful for you, and also, if you leave a 5-star rating, I'd really appreciate it. It just takes about maybe 10 seconds to go to iTunes, where you may already be listening to this. Give us a thumbs-up, and that helps other people find it.

Already 1,500 people have given Bulletproof Radio a thumbs-up. We've won a Webby Award, and have somewhere around 50 million downloads. This is an amazing thing for me, just because it's a sign to me that the show is doing what it's meant to do, which is to help people and to do good.

It's consumed more than 100 lifetimes of human life, if you just look at the number of hours of people listening to the show, which means, I hope, that it's really doing good for you. Because if not, then I'm kind of a mass-murderer and that would be bad.

So, if you like it, tell a friend, leave a good rating, and pick up a copy of Headstrong. Thank you.

Dr. Mark : Thank you.