

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 Da Vinci may have had an artistic edge because of an eye disorder. Visual neuroscientists at the City University of London examined six pieces of art including his Vitruvian Man piece and five of the pieces depict an eye misalignment that would be consistent with a disorder called exotropia that interferes with your ability to see in three dimensions. They're theorizing that Da Vinci may have had this which causes one eye to turn slightly outward and it's one of a bunch of different eye disorders collectively called strabismus and today that affects about 4% of people in the US and they can get special glasses, eye patches or surgery. Researchers calculated the differences in eye alignment using the same sorts of measurements that an optometrist does when tailoring a pair of glasses and most of the portraits showed eyes misaligned but Vitruvian Man by Da Vinci did not have that, so they think he may have had intermittent exotropia, which means that it may have just happened some of the time and maybe he could even control it.

Dave: It's also known that many artists shut one eye when viewing their subjects to more easily translate the details into two dimensions and if you have this intermittent exotropia, you could easily switch from 3D to 2D and back again with ease, which would be a visual superpower, which is kind of cool. In my own life I actually didn't know this, but I would do that. My left eye was weaker than my right and this was a neurological thing, probably from birth or something, they were never quite sure. So in conditions of eye strain, my brain would turn off the visual input signal for my left eye and I would see in two dimensions only and only through my right eye and I had no idea this was going on until I was in my mid 30s and I started doing a hacking of my visual system.

Dave: Today at 45, I see 20/15 in both eyes. I can read the finest point text that they have at the eye doctor and they say things like, "Hmm, that's weird, your eyes exhibit none of the stiffening of the lens that's characteristic with your age group." I think, "I wonder why." They look at me and say, "It's probably those weird TrueDark glasses and all the supplements like Eye Armor you take." I say, "Hey, I'll go with that theory." Whatever it is, your eyes are way more trainable and I actually train my brain to put my eyes back in 3D mode. So kind of interesting. Did you know that you can turn your eyes on and off one at a time? Whoa.

Dave: If you like this kind of crazy stuff, check me out on Instagram. I am dave.asprey on Instagram. On Twitter I'm bulletproofexec and if you go to Instagram, I'm going to be doing some crazy giveaways for the new book called Game Changers that's coming out soon, so you'll want to following me there.

Dave: Today's guest on the show is Caspar Szulc. Caspar is co-founder and president of a company called Innovative Medicine and he grew up in a family with doctors. His father was an anesthesiologist and chief of pain services but was traveling the world to meet shamans in Peru and Chinese healers in China and he grew up in the East and the West looking at the most hardcore of Western practices, you know, how do you sedate someone for surgery and then how do you do something crazy in the jungle and that led him to create a company that is working on how to unify personalized medicine, which

frankly is one of the most boring statements I've ever said. "Unify personalized medicine." What that means ... he's glaring at me right now. What that means is they're looking to figure out the same thing that I'm looking to figure out which is what is going on with you versus what is going on with a set of a million people and treating you like you're the same as everyone else.

Dave: I'm always inspired to bring people onto the show who are paying attention to underlying pathways and to individual treatments and to giving each of us the ability to say, "Here are tools you can use that are going to give you more energy," and we're going to talk a lot about energy on the show today because he's done a lot of work with the some of the newer anti-aging supplements, which is the other reason he's on the show. Caspar, welcome to the show.

Caspar: Pleasure to be here, Dave and that was an excellent intro.

Dave: It's always funny because you work with the company that makes Nadovim, which is a supplement that contains NAD and people who've read Head Strong know about NAD as part of the electron creation and recycling system in your cells, the mitochondria, it's critically important. They've heard me talk about how I've done intravenous NAD and how important it is to take NAD precursors and even to take NAD itself. So you've focused on that stuff and how the heck do you translate that stuff to someone who doesn't know what NAD is and you say things like, "I'm looking to insert some marketing buzzwords here." But I'm just going to go right for it. Of all the things you could do with the set of knowledge that you have, why did you go for focusing on NAD as a low-hanging fruit for creating wellness in people?

Caspar: Yeah, it's an excellent question because there are so many things out there, we do have this toolkit, especially at our medical clinic that there are so many different therapy adoptions, so many different interesting ingredients and why single out that one? I think it stems to when you look at the population and you look at what's going on right now, there is this basic crisis of brain energy and it's affecting everyone, it's really affecting the population of patients we saw, even if it wasn't a brain type of disease, we still saw that the brain was affected and the brain's incredibly important in mediating all symptoms and also going to the root causes and getting someone back to health.

Caspar: So when we started to look at, all right, how do we truly improve the brain and how do we address it in a way that goes after the modern day pieces which are throwing us off? We have so much stress nowadays, we're living in a different time, where there is social media, there is this information overload where we have more toxins than ever in just our food sources and then we're really, really pressured by these things and they're mostly impacting not just us on a cellular level but also on that brain level.

Caspar: So when we looked at that and said, "All right, we're seeing this crisis of brain energy, what's the one piece there?" If we could hone in on one, and we never like to do that because we like to look at things comprehensively and everyone is different, but if we were to single out one piece in there, one piece that's being depleted at an alarming rate, it's NAD and this is something critically important to every single cell in the body. It's probably just as important as oxygen is and without that, with that depletion of

NAD, you're going to see a host of symptoms, even in healthy people, the brain fog, the loss of memory in baby boomers and in patients with neurological conditions, that's an element to factor in there as well.

Caspar: So when we looked at all of that, we were able to say, "All right, we want to put something out there, not just for our patients, but also for the general public, to really help and where can we do the most help?" And we started with NAD.

Dave: Now NAD is a compound in cells that takes in electron made by the Krebs cycle and basically moves it around. So if you're making enough energy but you've got nowhere to put and no way to move it because essentially ... this is not physically accurate but it's useful in terms of a picture in your head it's useful. Imagine if you had a giant generator that could make enough energy and had enough fuel but the wire coming off of it was very, very thin. You couldn't carry enough of that current to do anything with the electricity made and this is one of the problems in mitochondrial biology, where usually your mitochondria just don't make energy the way they could. They're not efficient at turning food and air into electrons but even if they do that, if you don't have a carrying capacity for electrons you're still screwed.

Dave: So when you find a way to create more electrons and to have enough NAD present to carry the electrons, you get a system that works really well. If you put in tons of NAD but you still can't make energy, it's not going to make as big of a difference but most people as they age, they lose NAD and it can decline by as much as 90% between zero and 90 years old. So we know it matters, we know old people have less of it but it was pioneered in drug and alcohol addiction. Can you talk me through how NAD came about in that world?

Caspar: Absolutely and that's where I first heard about it. My father was of course a doctor, was looking into it for a very long time and was even looking at it when it was in Mexico for number of different reasons being used there by a pioneer out there [inaudible 00:09:41]. Where we found it, United States, was in drug and rehab facilities that are in the cutting edge of things and basically in that state, you're going in ... and we saw this first hand, we'd go into these centers and you'd see people going through withdrawal. For an addict, that's the worst part of it, is the withdrawal, is basically ... that's what keeps many people in an addictive state, not so much that the addiction to the drug is there, it's the fear of withdrawal.

Caspar: So NAD is actually an excellent compound that you can pump into the body and what we saw were people sitting in their IV chairs in a state where they're going through withdrawal but over 10 days basically had these 10 hour IVs of NAD and were reporting a huge decline in the symptom of withdrawal and if you could do that and NAD is binding the receptors where the opioid receptors are, so it's basically helping in that respect as well. It's providing energy and of course drugs, alcohol, stress are the major contributors to NAD depletion. So someone who is in an addictive state, this is an incredibly type of therapy that is natural first off, so we're not talking about anything here that would have other repercussions like many of the drugs we use for people going through opioid addiction and in a matter of 10 days or so, you were seeing people

that were truly in a very addictive state, about to go through a terrible withdrawal, leaving there in a much more clear state.

Caspar: Their brains are transformed and their withdrawal symptoms had greatly diminished and that was, I think, an eye-opener myself as to, okay if this is working in the brains of addicts at this rate and doing so well, how could we translate that further into other patients and also into the public? That's where we went. We basically transitioned it saying, "Okay, it's working quite effectively in addicts for recovery and for withdrawal symptoms and what if we position that to people with neurological symptoms? What if we looked at Parkinson cases? What if we looked at all of those?" That was the first pivot for NAD that we saw.

Dave: I interviewed Joe Polish from Genius Network a while back, who's a very successful business person, spends time with Richard Branson and some of my other favorite big name people, Tony Robbins, people like that. Joe just flat out says, "Yes, I used to be a cocaine addict and a bunch of other kinds of addicts and I'm not any more." He's working on curing the world's addictive problems. We talked in that interview about how a part of addiction is this feeling of emptiness and I've been on a few other podcasts where I've been interviewed about addiction and what happens we'd get ketones present and bottom line is, if you're always hungry, it might be because you're lonely, because you have trauma, and there are connections there, but if you're always hungry at a cellular level, you're always hungry because you're not turning food into energy or maybe you're always hungry because even if you have energy, you can't move it around because you're depleted, you will carry that physiological, psychological, even a spiritual kind of burden because you feel like you're walking through mud all the time.

Dave: As a former 300 pound guy, with cognitive disfunction, this is a state that I'm not going back to. I think it makes a lot of sense that addicts, when suddenly you fix the cellular wiring system, suddenly have less of a wall to climb to get out of addiction. So I've done the addict level treatment, normally it's a 10 hour treatment, there are ways to do NAD ... and by the way, I wasn't an addict, but I also want to live to at least 180 so I do every aggressive anti-aging thing. Like the world's first six hands, total body stem cell thing, with stem cells along my spinal sheath and stuff like that, but I've done 20 of these NAD treatments and what they normally do is about two and a half, three hours, for people who aren't addicts, to put a gram or so into your vein. You say, "Why would it take two hours to do that?" Because it feels really intense, almost like the beginnings of ayahuasca or some other thing like that. Not where you're tripping but just where there's a weird pressure in your chest.

Dave: I got down to in 45 minutes, I can pound a gram of this stuff, which is kind of unusual, but I'm planning to do NAD intravenously and orally, but certainly intravenously at least once a quarter to keep my levels topped up for the next, at least century. Yes, I said century, I really am going to live to at least 180. If you're listening to this, I really hope you heard this and you said, "Let's race." Because that's why I'm saying it. I think I'm not the only one who's going to do it.

Dave: Now, traditionally though, we've all been told NAD doesn't work orally and a lot of IV nutrients, it turns you can't. Glutathione's another one, Bulletproof makes Glutathione

Force because you can make it work orally but it took a lot of biochemistry in the lab for us to get a capsule in the lab that wouldn't just get digested, that had dry liposomes in it. What did you do to make NAD something that you can get orally instead of via some other mechanism?

Caspar: Yeah that was a big challenge because we saw, like you were mentioning, these great benefits in the IVs and such improvements all around in the cognitive functioning and we were saying, "Well how do we get this orally?" Because it is well accepted that is only intravenously or intra nasally, you can do a spray into your nase-

Dave: And patches too.

Caspar: ... nasal cavity. Patches too, that's right but it is a delicate molecule and it is believed that consuming this coenzyme may destroy it and that's really based off a 1983 bioavailability study that showed it was hydrolyzed in the small intestines. But since then there's been a lot of different studies that point that that may not be true. One coming out that I know of Japan 2006 basically showed that when using NAD, NADH, you saw an up level in the blood when it was given orally. Through our research as well, we also saw that it's about a little bit of protecting the coenzyme and also combining it with others that'll make it more bioavailable. So that's why we didn't just straight up go with NAD alone. We did realize that that would put it at a higher challenge and probably not as bioavailable as when it's combined with other ingredients that are known to help with the absorption of NAD, not just into cells but actually help them through those brush border cells in the intestines.

Caspar: So it was a long process of research and development and basically my father was like a crazy lab scientist in there trying to see what other ingredients ... how can we put this in specific ratios, how can we improve on that and get it where it needs to go? Inside the cells and especially in the brain and that was a challenge that we finally came up with this formula that was eight separate ingredients. The funny thing was as we were doing this, and this was of course probably three to five years ago when we were starting to look at how to combine this in an oral way that's going to be bioavailable absorbed and really make an impact, we were kind of pioneering a lot of stuff and throwing some stuff on there, really testing it left and right. While we were doing that, studies started to come out more and more. I know one of those studies showed that CoQ10 and NAD can absolutely orally increase our ATP via that mitochondrial oxido-phosphorylation.

Caspar: So it was kind of funny, when we started selecting those ingredients and looking at them and saying, "All right, how can they be synergistically applied together, work and actually improve that bioavailability through an oral ingestion pathway?" The studies started to actually give us a little bit more hope and actually prove that this is a method of getting it in there. We've also seen that now anecdotally through the patient base and through people who are actually using it. They're reporting that similar effects of having those IVs once a week or so, or once every other week where this is a daily consumption, where you're actually replenishing those NAD levels every day a little bit more and a little bit more. So it's not, of course, an intravenous infusion, it's going to get many more milligrams directly into the bloodstream but when you're doing this, and the way we formulate it out is to get that constant slow improvement and that constant

uptick of NAD levels where it needs to go within the cells, optimizing mitochondrial function and really optimizing the brain on a whole.

Dave: What about a clinical studies? I know we just filed a patent for Smart Mode, which is a set of botanical ingredients that are all individually clinically studied for cognitive enhancement. Very different pathways and something that stacks well with NAD but you've got eight ingredients in there, do you have evidence that it actually does absorb?

Caspar: Well right now, we're working anecdotally off of that. We're working strictly in that patient base. So for the last eight months ... this just came out to the public within the last month or so. For the last eight months and even the last year at our center, we've been using this on patients with Parkinson's, on patients with Alzheimer's, dementia, Lyme disease, inflammatory mold disorders, and we've been seeing that improvement there. We're looking to get into those clinicals next, to prove that it's actually going where it needs to go. At this point, it's really from our perspective, it's that clinical medical background of seeing the improvement symptomatology and showing, "Hey, try it. If it works, that's one sort of proof and let's keep going from there."

Dave: One of the reasons that I wanted to have you on the show is that I'm pretty good at sensing whether something is affecting my mitochondria or not because I've had mitochondrial dysfunction and because I manage that, it's something that's under my active control. I can tell you if I'm in a moldy hotel room or something, I feel the decline, I can see the change in my skin tone, I get muffin top I didn't have before, my brain works a different way. If you take something that reverses that, I've written about a bunch of these in Head Strong, even about a couple more in Game Changers my new book, but these are important compounds because the fact that I'm paying attention doesn't mean that other people when they get off an airplane don't all have mitochondrial dysfunction. That's what flying does to you.

Dave: So you can try something like Nadovim or anything else, whether it's fish oil or just not eating on the airplane, or compression pants, whatever, but there's a bunch of different things that will change how you feel and change how you function and I'm totally willing to take a supplement and if I can feel the difference then say, "All right, I'm going to add it to my tool set." What I don't want to do is make supplements that you can't feel and I don't want to recommend supplements you can't feel. So I would just encourage anyone listening to this to try stuff and say, "All right, do I feel it?" There's two ways you can feel something like NAD. If you are deficient, so you have a little bit of brain fog right now, maybe you're super hungry, you put yourself through a heavy workout, through emotional stress, through physical stress or travel and jet lag whatever, you take it, maybe take a double dose. You go, "All right, I got my brain back." That's very useful information for how to hack your performance.

Dave: The other way you can feel things is you can feel things over a longer period of time, where you say, "All right, based on the literature I've read, based on whatever the vendor's saying, then I'm going to take it every day for a month and I'm going to look at how often I have to pause and try to remember a word, or whether I put my car keys in the refrigerator the way I used to, or whether when I'm going to bed and I want to read for 20 minutes, if I can't keep my eyes open for more than five minutes but I take this

stuff earlier in the day, and it's not caffeine or something then, "Oh wait, it was effortless for me to pay attention until I was done." It's those little things that can shift over time but I found that with NAD, and Nadovim, whether IV, oral, whatever, that I definitely notice a change in those nuanced levels of performance that I what I monitor to see whether what I'm doing is working.

Dave: What have you seen in yourself from increasing your NAD levels Caspar?

Caspar: Yeah, before I jump into myself, you said a lot there that definitely hit nail on the head, because one of the stories I just heard from someone that's been using this for a few months, an older woman that was basically going through some cognitive disfunction, brain fog, memory, she was telling me this story that she was trying to remember the name of her childhood friend for the last few years and just couldn't. She wanted to go back, Facebook her now, it's been so many years and she said after about a month or two of Nadovim, it came back to her. Now, is that a correlation of one to one? I'm not going to say that but it was just a funny story of you start to pick up on words and you don't miss it as much and that's one of the effects. That's something you might see when taking an NAD supplement or ingesting any NAD. So that's something you'll see there.

Caspar: For myself though, coming from a relatively healthy space, I think it was a few different pieces and benefits that I've seen. One is, I do travel a bit and NAD is also very much linked to circadian rhythms. That jet lag that a lot of people experience when they travel, when you're taking NAD on the regular, you will probably have a much quicker recovery when you go into a different timezone. That's one of the pieces I've definitely seen there.

Dave: It's really cool that you bring that up. In a recent interview with Andrew Herr, who's for 10 years worked with the department of defense on basically figuring out what super soldiers are going to look like, with three different degrees in physiology and things like that. He's come to the conclusion that a huge amount of jet lag is not just circadian disruption but it's mitochondrial disfunction from flying. I'm in agreement on that and that means what do you do to feel better? It means you take mitochondrial enhancing supplement when you fly. So I absolutely take Nadovim, I take Ketoprime and Unfair Advantage, I use the TrueDark glasses for the circadian thing and this is going to sound crazy ... oh and I wear compression pants, I don't get jet lag. It is gone from my life and that whole stack, it matters because you want to make the energy, you want to transport the energy and you want to tell your brain it's dark when you want it to think it's dark even if it doesn't want to do. You do that, it's like ... oh and the pants, do you wear compression pants?

Caspar: Yes.

Dave: You do?

Caspar: Yes.

Dave: All right.

Caspar: I do it all, I'm in the amber glasses and all that, looking at chronobiology. I love chronobiology and I love understanding nature's rhythms and our own biorhythms and that's something that really interested me with NAD as well. It was like, oh wow, this is part of that too.

Dave: Is there a daily pulsing cycle? I don't know this about NAD. Is it higher in the morning, higher at night? How does it change over the day, do we know that yet?

Caspar: From the research I've seen, it does have a little bit of that cycle and we actually recommended ... this is also because we have larger amounts of thiamine and other pieces that may give you a little bit of a boost, but we do recommend it in the morning and then just maybe around noon in the afternoon. That's when we're seeing it. So we're correlating it a little bit more towards what you'd see with cortisol levels as they spike a little bit in the morning and then go down as they go. But I can't say for sure, I haven't seen enough research into that, this is just based off what I've heard and seen from other people and other doctors and experts.

Dave: That makes a lot of sense. If you think about it, we evolved from these ancient bacteria that are still calling the shots inside our body, the mitochondria, and they would go through this cycle where the sun rises, they come to the surface, they start feeding or photosynthesizing and then as it gets darker and colder, they go down into a recovery mode. So you would imagine that the compound that transports energy would be higher in the morning as the sun peaks and then lower at night. That makes great sense and this is one of the reasons that even for something as simple as magnesium, you need magnesium to make ATP, I've always recommended magnesium at night because we know it helps us sleep better, but the circadian curve of magnesium is very interesting because it turns out it peaks at noon as well. So I switched the recommendations in Head Strong to say, "Take your magnesium in the morning and at night so that you always have enough to make energy and if you don't have enough energy when you're sleeping, life sucks."

Dave: So for people that don't have a hard time going to sleep, I think it's a good idea to have extra NAD before you go to sleep so that you have an extra big pipe to carry that energy, so that you can get more effective sleep in less time. How much do you sleep?

Caspar: I sleep eight hours a day. Sleep's incredibly important, that regeneration. As an entrepreneur, as someone that pushes themselves during the day and wants to be as productive as possible, I understand the polarity of things. You need as much rest and you need to regenerate and that's a huge part of it. So without eight I'm just a mess in some ways and that's just the key of basically exertion and then regeneration. You need that. Inhale, exhale, right? All of that, and that's incredibly important. So rest and regeneration is something we also really hone in on, that chronobiology, understanding biorhythms with patients. Patients are usually the most difficult when it comes to insomnia and sleep problems and all of these and that's a huge part of it. So you got to hone in on that restoration.

Caspar: NAD's one of those things that can absolutely help and like you said, all those other elements we've kind of included in that, which include magnesium glycine for [inaudible 00:28:13] epigenetic reprogramming of the mitochondria as well. Those are all essential to, I think, having that proper cycle in order, that's always disrupted by so many things. By light bulbs, by everything out there, by electromagnetic sensitivities and that's a big part of it. So rest is incredibly important, that's something we wanted to also showcase with Nadovim.

Dave: Now what else are you doing in the clinic for people? Because you're seeing people with Parkinson's and Alzheimer's and people listening are saying, "Oh I don't have those." But here's the deal. If you're going to make it to 90, you have a 58% chance of having Alzheimer's disease if you're average. If you're a woman, you have a higher than that, because that's a mixed thing. Women get Alzheimer's more than men, which is why ... but I just found out, Bulletproof, we've been donating all of the proceeds from the meet-ups that I've been doing around the country to meet with biohackers in preparation for the conference that's happening April 5th, the new Biohacking Conference in LA, but we've been donating all those proceeds to Maria Shriver's Women's Alzheimer's Movement and last I heard, we're the largest donor. That in combination with the Omaze campaign that we've been backing, where people can win a chance to spend some personal coaching time with me and do 40 years of zen. So that's at Omaze, but all that stuff, it's because Alzheimer's matters.

Dave: So you're working with patients in the clinical who have Alzheimer's disease and other things. So it applies to all of us. We can tell if you're going to get Alzheimer's sometimes 20 years before you actually have symptoms, so the stuff that your grandmother may be doing now to try and remember basic things are things that if you do now you might never get to that stage. So that's why this matters for everyone. Tell me what you guys are doing for Alzheimer's and Parkinson's and things like that, what you're seeing? Both with NAD and outside of that.

Caspar: Yeah, I mean each case of course is going to be different. That's the beauty of personalization you have to go at those root causes, but in Alzheimer's and Parkinson's you see a lot of these brain dysfunction, you see a lot of toxicity in the brain, you see a lot of different heavy metals, you see a lot of emotional pieces as well, unresolved emotional pieces, that's why we do have a psychologist on hand. We're utilizing more advanced psycho emotional pieces to address while going in on the biochemical side. chelating a lot of those pieces out through personalized methods, really finding out what the root causes are and in most of those, there's this overactivity, you have to look at those neurotransmitters and those levels, what's going on there, is there dopamine restriction, is there something else that needs to be addressed?

Caspar: Once you find out the root causes, then you personalize through a number of different ways. NAD has absolutely been pivotal. Usually we like to cleanse the inner environment, make that as effective as possible because we are almost kind of loaded up with a lot of garbage toxins and other things that really-

Dave: How do you cleanse?

Caspar: We go about it in a more natural way of trying to boost the organs of elimination. They are usually hampered over many years and also trying to pull a lot of those toxins out that have been stuck in there, in connective tissue and really allow what your body does best to do that again. We're talking about the lymphatic system, liver and kidneys mostly. Those are three organs we like to hone in on in the beginning of treatments so that we can basically clean out the body. It's like when you want to do a spring cleaning and everything's around there, first you got to make a little bit of mess but then you got to organize it, push it out, clean it out, basically get it out and then you could do other things. You could go in with other treatments and efficacy actually goes much, much higher.

Caspar: So it's that understanding of the inner milieu, it's more of a European biological approach I would say that really is honed in on in Switzerland and in Germany, of clean the inner environment, that milieu and then the body is already in a better state to react to any other treatment that comes after that, whether that be conventional, alternative or anything afterward. So it's a big part of the beginning stages and of course each one of those treatments is personalized. Perhaps the liver is functioning not as well, or a lot of times it is all three, to be honest, when you're already in a chronic disease state and especially something that's neurodegenerative, like Parkinson's and Alzheimer's but that's a huge number one step in our treatment step.

Dave: So European biologicals, this means organ extracts, peptides, things like-

Caspar: mRNA therapies, yeah. It's all of that, it's looking at it from a pleomorphic view, understanding Enderlein's work there and then really trying to hone in on what is the true initiating factor and also improve that cellular ability to detox itself. Cells a lot of time become stagnant, don't work properly, that is of course linked to the mitochondrial function, so it all goes back to the mitochondria and the in and outs of how a cell operates and the ability to also push things out of that connective tissue, that mesenchyme, and really clean up the area in general so that every treatment that comes after that can be more efficient and you get better results quicker.

Dave: Can you explain pleomorphism for people listening?

Caspar: Yeah, pleomorphism is a little bit difficult. I'm not a doctor, I understand just a little bit of the pieces of Enderlein's work of understanding the microbots and really understanding how bacteria's fate and the ability to reproduce in the body can be used to actually help a patient. So again, I'm not the expert on that-

Dave: I can take that.

Caspar: Yeah, yeah, please.

Dave: I know that you're on those supplements side and you work with your business partner who's on the medical side of the clinics-

Caspar: Yes.

Dave: ... so it's okay to say, "All right, I'm calling that." Pleomorphism is this fantastic idea that I'd love listeners to hear more about and it was widely, I think the technical term is shat upon, by Western doctors. The idea is that bacteria in the body and cells can change shape and form. Now this is funny because in the world of mitochondrial biology, keep in mind mitochondria are just ancient bacteria that are incorporated to be parts of our cells, but they still function with an operating system like ancient bacteria. They change size and shape all of the time and we have this continuous stream of new studies in the last five years showing that mitochondrial size, shape and morphology and division and communication are underlying almost everything we do. In that world, of course we know that sometimes under conditions of stress mitochondria become very long and thin and stretched out and other conditions of inflammation they become bigger and they're constantly changing their size and it changes what they're capable of doing.

Dave: Now, other bacteria can do the same thing and they change size and they change shape based on the environment. That's what epigenetics is and the definition of biohacking is changing the environment around you and inside of you so that you have full control of your own biology. So it isn't at all surprising now that we have better microscopes that we can say, "Oh yeah, it turns out bacteria do do this but then we still have a cadre of physicians from the West who'll say, "But we have no idea why." Then we have a bunch of people operating in clinical settings with patients saying, "Well we know that if we change the level of toxic metals in the body, or the levels of NAD in body, or the levels of coenzyme Q10 or anything else, that suddenly bacteria will change and so will the bacteria that power who you are." That's become something that to me isn't even controversial.

Dave: What is not well elucidated is what makes certain bacteria change. Is it a frequency thing? Is it the level of PH in the water of your cells or is it all of the above? Who knows but the fact that all these bacteria can change shape, they could lose even their cell membranes in the case of something like Lyme disease, this is all real, it's just something ... like acupuncture. 20 years ago if you said acupuncture, you were clearly a which doctor and now they're saying, "Oh yeah, we can measure those spots with delicate electrical things. Turns out there was something there, we were kind of wrong, we just don't like to talk about it." So we're continuing down this path. When you hear pleomorphism, you're generally talking about stuff going back to Royal Rife and Tesla, or you're talking about something that's very cutting edge coming out of Germany. An accurate description?

Caspar: That's much better than I [inaudible 00:37:11], yeah that's very accurate.

Dave: So I just hope one of the goals of this show is to help people learn about things like this. So will you go into your doctor and say, "I'd like to increase my pleomorphogenesis." Or some sort of made up word like that? No but when you're looking at making an organ work better, there are a bunch of things happening, particularly in Germany and to some extent in other parts of Eastern Europe or Russia around manipulating these that have very strong research things, many of which haven't even been translated into English yet, but that are legitimate and worthy of further study in the West. So you guys are touching on that clinically and finding clinical success with Alzheimer's and Parkinson's and things like that?

Caspar: Yeah, yeah and that goes across the board, not just the neurodegenerative. We look at every single disease as it's your own interpretation of a disease, the diagnosis is there of course, but what are the underlying factors and how can we treat this? So that goes into anything from stage four cancer down to hypertension or even an allergy and that's something that I think is radically different than conventional medicine at this point, where you need a diagnosis to then perform a treatment that is more about symptomatic relief and maintenance. Whereas our approach is looking at, "All right, what are really those root causes and how can we address those in a most efficient and personalized manner that is your own protocol, not a generalized trial and error protocol and then how can we get you back to health and basically out of this office as quickly as possible and self-healing and self managing?"

Caspar: That's the goal of it and I think that's what the body does incredibly well if you allow it to and if you take on that mentality of again, we are supposed to be healthy, that's our natural state, we're not just supposed to self-manage and do things for the body that it would be doing in a healthy state by providing life long intervention.

Dave: I'm hoping that many people listening to the show realize that they can do that without going into a clinic and that then never get to the point where I did where you're saying, "I would go anywhere and spend however much money I have just to feel like myself again." That is not acceptable that we create that circumstance, but it's also awesome that if you do get there, then there are places you can go. I think by taking basic steps to reduce what I call the ... I call aging death by 1,000 cuts. Just reduce the number of cuts and the depth of them, you'll still take some cuts, you'll just take a lot less and you probably won't get all those gnarly diseases that were coming your way or if you do, you'll get them 25 years later than mother nature intended. That's such a big win and along the way you can step in and get health.

Dave: One of the ways, in fact the primary way that I know of to do that, is you'd make sure your mitochondria are performing at their highest level. That means be good at turning food and air and maybe some sunlight into energy and be good at moving the energy around and carrying it. I think think NAD is a up and coming technology for anti-aging and one that I've incorporated in my personal protocols, which is why I wanted to have you on.

Dave: What's your take on NAD precursors? Just like you have ATP in your cells, you could take things like MitoSweet that are precursors to ATP, what's the merit of taking fully formed NAD versus taking an NAD precursor?

Caspar: Yeah, precursors and others out there, I think are effective at improving the levels of down the pathways of course of NAD and going into the system. Now where exactly that is going afterwards, they're not too sure, meaning that they know it elevates in the blood levels, whether that's going into the cells or into the right areas, it's still a little bit to be determined. It's one of the reasons, we saw NAD where a lot of people were writing it off. I think since we started to look at all this, a lot of companies are now honing in on NAD, there are shortages of NAD+, it's quite expensive and difficult to get that ingredient in a clinical high grade proven format. But what we've seen in our own clinical assessment is that NAD is a little bit more impactful, and especially when you

could stack that with other ingredients, when you can combine that with other pieces, it's been shown to have more effectiveness in the cells and actually greater impact.

Caspar: Now I think everything can sort of be looked at from two ways and I understand a lot of people that are really investing in the precursors will not like that assessment of it, but it's something we tested on patients and it's something we really looked into, that NAD+, the oxidated version of it, even looking into that electronic transmission, looking into the mitochondrial pathways and what's really going on. We were able to basically see through the results, through the patients, that there was this great improvement. Why change that? I don't know of many people utilizing precursors within their IVs and seeing results. I don't know any doctors utilizing that and I know a number of doctors and more and more, especially in the integrative field, that are turning to NAD, not just for addiction, but for everything, for even their wellness patient list such as yourself, to just really optimize the mitochondrial function, optimize brain function, be in that focused and primed end state for longer periods of time.

Caspar: We're looking at it from an ability to not just replenish, we also want to look at it from ability to pre-plenish. Like you said, we want to prevent, we want people to live to 180, we want to do that and we want to look at it. We know that through the mitochondrial theory of aging that's incredibly essential and then we also know that scientists have recently found that where has aging really start from? Well it's partly because of the hypothalamus and looking the those neuronal stem cells that kind of dictate how aging occurs. So we saw this opportunity to use something that had been proven in our clinic and throughout many different doctors around the world with NAD+ to combine that with other elements that would synergistically apply and work better and actually all of them have some role in mitochondrial health and quality of mitochondrial functioning and also the brain, because we're throwing adaptogenic herbs such as bacopa into it, in very special ratios that were all tested for that synergy.

Caspar: That's where we believe that prevention also occurs. That aging occurs and looking into that from a unique perspective.

Dave: As 20 plus years formulating supplements and being in the anti-aging field myself, precursors are useful. So for glutathione, the primary cellular and liver and brain antioxidant that's part of the mitochondrial, basically amazing, set of pathways and other things in the body. If you go back 20 years and say, "Oh take vitamin and C and something called antecedal cystine and that'll raise your levels of of glutathione." And it will, there's just one problem. For your body to make a new compound, it takes electrons. Your ATP has to work, your mitochondria have to work. You take that manufacturing capacity within your body and you say, "All right, make this compound." Or you take the compound that's pre-made in a way that can be absorbed and now all of the manufacturing capacity that would have gone into converting precursors is reserved and you can use that manufacturing capacity to cause autophagy to kill cells you didn't want, to remove senescent cells from the body, cells that are sitting around doing nothing. Or to fold proteins more effectively, or just to make more ATP.

Dave: So in the case of glutathione, we make a liposomal form in capsules because I have found over and over that intravenous glutathione, or oral glutathione that can be

absorbed, is more effective than precursors because there's a rate limited conversion inside the body. So I'm all over precursor and I suggest you take precursors so that your body can always manufacture what it needs with less work than if you're just lacking in precursors. Even something as simple as the Bulletproof collagen peptides that are in all of our collagen bars and everything, you need to have those raw materials to make connective tissue in the body and it's probably better to get them preformed, according to several different studies I've cited, but regardless, if you don't have the raw materials you're hosed, you just won't do it.

Dave: I think the same is true of NAD. Precursors? Sure, take some precursors but can you bump your levels higher than mother nature wants? Because I don't care if I'm 45, I want my body to look and act and perform more like I'm 25 but maybe with a bit more wisdom from having failed a few times. So people ask me this, "Should I take precursors or should I take the fully formed?" The answer is yes. Right?

Caspar: And everyone is different. Of course, we understand that, we're never looking at it from a magic pill perspective or this works on every single person. I think in general, you have to look at it, NAD levels are incredibly important. What we've seen with at least 85% of the patients that we put Nadovim on, these are patients already dealing with huge depletions, we're not talking about a truly healthy population, is that there is this improvement and focused concentration of ambidexterity. All of those pieces are truly improving. So we're seeing it as this is a solution, it's not the only solution and precursors absolutely have a role in this as do other things, other areas and of course lifestyle and all those pieces are incredibly important.

Caspar: But we also know that we live in a society that is just bogged down with so many different stressors and so many different pieces to it, we can't just go live in a cave in nature. I mean, we could but we probably won't and that's the piece, that you will be depleted whether you like it or not, in some way, shape or form of NAD. How you're going to raise those levels, you have different options from the IV to the precursors and I think we've done a really good job of creating that extra option and a specific one that really hones in on brain performance.

Dave: It definitely works, you can feel the difference, or at least I can, when I take Nadovim or when I get an IV. There are lots of compounds you could take where you don't necessarily feel it and that means either it's not the right compound for you because your body has enough of it and you should take your hard-earned dollars and apply them where you can feel them first and if you're in a position where you have enough hard-earned dollars that you want to double down on aging, then you take the other stuff that you know is good. I do 150 plus supplements a day, at least pills, some of them are the same supplement, more than one pill and of course I manufacture a bunch of those and there's a bunch that I don't manufacture because there's good data somewhere and all that. I'm very willing on this show to talk about all the different universe of supplements, whether or not it's something that I've formulated, because I think that there's no one company on the planet that makes everything out there that you might want to take.

Dave: Also, what you might want to take is different than what your mom might want to take. It's a continuous personal evolution of, "What's giving me the most ROI, the return on investment?" The investment you have is in dollars, clearly. It's in time, energy or even pain. So if you don't like swallowing pills, how can you swallow the least number of pills and get the most good stuff in there? Things like that. So it's inconvenience, friction. You could spend six hours a day studying and trying to optimize that stuff and I probably do do that, because I love this stuff and it's changed my life and I know that it's changing other people's lives. I'm totally happy to do that but for the average person listening to the show who has a job and a family and things to do, you want to be able to have that shortlist that says, "All right, what are the things that are going to get more energy that I could try to see if they get me more energy?" I think Nadovim belongs on that list of things to give it a shot. That's why you're on the show.

Dave: I also think if you're listening to the show and you have the economic means, you live in a big city, that you might want to try an NAD infusion, or the protocol for drug and alcohol addiction. There's 10 of them and for people who are generally healthy, it's five IVs but those IVs are going to cost you a substantial amount of money, they're a potent anti-aging treatment. We even do some of those at the Bulletproof Upgrade Labs in Santa Monica. That may not be affordable, so what's close to that? Same thing, glutathione IVs are going to cost a couple hundred bucks or you could take some orally. So with Nadovim you're getting some NAD into the system that's preformed and looks like it's absorbable based on what you guys are seeing in the clinic and you're looking into some clinical studies on it as well.

Dave: So if I can feel something, I'm willing to talk about it and to give it a shot in the air, which is why you're here. Is there anything else you're working on? What's next beyond Nadovim? Is there another magic supplement? Are we going to get ground up pixie dust or something?

Caspar: The pixie dust is on hold right now but no, we're definitely looking at a lot of different things. We want to address these things that we're seeing. We have this unique insight and we have a patient base that comes around the world and we don't specialize in any one thing, so we're really getting a unique perspective of what's going on out there, what's affecting patients, and then you can kind of translate that into the greater population. I think a big one out there that we're looking into is inflammation or detoxification, looking at those sort of things instead of the energy and mitochondria, also all the pieces that are already in us that are not allowing us to properly function and how do we get them out of us?

Caspar: We're looking at different ways to do antimicrobials. I think so many people now Dave have all these infections and don't even know it. People come in sometimes that are relatively healthy and they're shocked to learn when we do our evaluation that they have five, six pathogens. They have parasites in them, and they're just slowly leeching away and leading into, I think, a more symptomatic way.

Caspar: So if there's any way to boost immune system by doing that naturally and changing the environment where those pathogens can't survive, that's something incredibly interesting. We're also looking at improving the heart. We like to look at it by systems,

not symptoms. So we're looking at the organs, we're looking at the body by the systems and getting the system to do what it needs to do on its own, without always having to rely on something. That's why Nadovim also is a little bit interesting in that way, we looked at it from, "All right, what's out there in the nootropic world?" So much of it is about acute stimulation with a drop. If anything, sometimes you're actually depleting levels of key metabolites by taking them.

Caspar: So we wanted to look at this as a long term systematic improvement where the system or organ is improving because you're providing it with something that allows it to do what it's supposed to do in its optimal fashion. So we're really looking at all of these different systems, whether it's detoxification system, immune system, or these organs such as the heart, even lungs and saying, "All right, well what can we do? How can we formulate other ones in very unique fashion? How can we see what has worked from the patterns not the particles in our clinic and how can we formulate that and provide that to the public?"

Caspar: So there's definitely a lot of interesting things going on there. There's always new things and we're always learning about new key ingredients and coenzymes and how they're going to work together better to impact the human body on a systematic level and truly allow our bodies to live longer and healthier. I don't think those two have to be either/or. I know a lot of people think, "Well if you're going to live longer, your quality of life is probably going to go down." I disagree with that, I think if you live longer, I actually think if you live longer, it's due to your quality of life being higher.

Dave: I think it's really important to keep your mitochondria working well and that's why I'm taking the 150 supplements I have, that's why I change them every week or two, based on what I want to get done, based on the newest research, and that's why over the last two years, NAD has entered my biology in the form of IVs, patches, nasal stuff and now orally, with Nadovim pills because I can put them in my morning stack and I don't have to pay attention to it and I like that. I think that's going to get me in better shape but in the meantime, I don't want to be declining. I want to be at least holding even if not getting younger, which I seem to be doing. So thanks for pushing the limits on getting NAD into the body without me having to get more needles, because I'm kind of tired of IVs.

Caspar: No it's my pleasure. I think you hit on some really interesting things right there, because I myself and what we're doing, we believe we are right on the cusp of this vertical leap in medicine, health and longevity and the three of course are interrelated in that we've been at this state where this MLP, this maximum lifespan potential's been hovering at 120 for a while and people have been saying that's the most, that's how far we're going to go, and experts ... but I completely disagree and research has come out from places like the Max Planck Institute that basically said there's no compelling evidence out there for an upper limit on mortality. I agree, if you look at it from different perspective and we can take that vertical leap that hasn't been done, probably in about at least a century. I think the last vertical leap we had in something that was like this in science, was Einstein and his theory of relativity and $E=mc^2$ and looking at everything through energy instead of just matter and then Newtonian principles.

Caspar: I think we're due right now and that's why it's so exciting and it's not just Nadovim, it's all these things that are pushing us and I think when you combine them all and look at it from a unique perspective and if we could get more people, such as yourself and others to really push this and really look into it and stop the doubters who are saying, "120 and that's it." Or, "Why would I want to be old and we're all going to get diseased." I think there's a tipping point and when we reach that tipping point, I think we're going to have that vertical leap and 180 is going to be that new MLP and then it's just going to on from there and that's what's so exciting about all of this and everything we're doing. It's not just about a product, it's about changing people's mind and it's about really, really pushing the boundaries of what's possible.

Dave: Well I think we're working on that mission together. Caspar, one more question for you.

Caspar: Yes.

Dave: Someone comes to you tomorrow and says, "Based on everything you've lived, everything you know, I want to perform better at everything I do as a human being, what are your three most important pieces of advice?" What would you have to offer?

Caspar: Number one is find what you love to do. Purpose and passion I think are incredible pieces for healing and for keeping people in a state of health. It's that unseen esoteric kind of piece that I give to people that they say, "All right, great that's not very medically inclined." But I truly believe that. Even looking at our patient base and knowing that those that leave treated but never find a purpose or passion go back into a diseased victimized state quite quickly. Whereas those that then leave after a complex chronic condition and have a purpose and passion now, gone on to live healthy longer lives and actually impact society in a much more productive way. So I think being truly passionate, insanely passionate about what you do, is a huge piece for performing at your best.

Caspar: Number two, I'll get back, is a little bit of when you're instantly passionate you usually work a lot, you usually expend a lot, is rest and regeneration. Don't forget about that, that's a huge piece. Do not wear that badge of honor for only sleeping four hours and then working 18 hours. That is not a badge of honor, that'll really [inaudible 00:57:32] and we're seeing it more and more of course that rest and regeneration are incredibly important and in many ways they're the cause of aging, disease and so many others when you can't get enough of it.

Caspar: The third one is, I think really hone in on ... there's a quote from Michio Kaku that basically says, "Sitting on your shoulders is the most complicated object in the known universe." It's true, your brain's so incredibly important and oftentimes we forget about it. We go to the gym, we care so much about how we look on the outside with our muscles, but we don't hone in on the brain, which is just so remarkable and allows us to do so many things and to be human and to have emotions and to think up these incredible ideas that are forever changing what we know as possible or impossible.

Caspar: So I would say hone in on the brain a little bit more and understand that is being attacked in some ways and just as you want to provide the muscles with different nutrients so that they grow, provide your brain with the certain nutrients and metabolites that keep it performing at top peak. Whether that be Nadovim, I have to self promote, or anything else there. From your side of it, from anybody's side of it, I think it's a combination of course. I think that would be the third piece, of really focus on the brain and appreciate what it's doing for you and keep it replenished and preserve that most complicated object in the known universe.

Dave: Caspar, thanks for sharing your take on those things. I love those answers. Your website is innovativemedicine.com and you've clearly got a bunch of stuff up there about Nadovim, the supplement that you make with NAD that's absorbable orally. I think that people listening to the show would be excited to give it a shot.

Caspar: Absolutely, thank you and they could also go directly to nadovim.com for that and just see everything that we're doing there as it is correlated strictly to the product but thank you Dave, I think you do an incredible job.

Dave: So you can go to Nadovim, N-A-D-O-V-I-M.com as well as Innovative Medicine-

Caspar: As well.

Dave: ... so on the medical side of what you're doing is there and ... okay-

Caspar: Right.

Dave: ... good deal. I'm hoping that you enjoyed today's show. If you did and you liked those answers, at the end you know what to do. Head on over to your favorite online bookseller and order a copy of my new book *Game Changers*, because I have gone to the trouble of statistically analyzing all of the answers in the show, almost 500 of them, to find out what people who are doing noteworthy big things, what they pay attention to the most, so that you can learn what not just one successful person does and try and copy it, but what all of them agree matters. So you can set your priorities in the right order. The reason I've written books the way I've done it, getting a good start matters most, that was my first book on fertility and then what do you eat to have more energy? That matters. Then what do you do to make your brain work really well? At this point, if you've been following the Bulletproof program, you probably have more energy than you ever had before and your brain works better than it ever did before. So now what do you do with all that energy?

Dave: Well I could tell you what I would do but I'm just one person and frankly, maybe you don't have a history of obesity, autoimmunity, and Silicon Valley computer hackerism. So what if we could learn from all of the experts who've been on the show? CliffsNotes, I've been learning from all the people I interview and for me to really crystallize all of this amazing knowledge, I wanted to put it into a structure and a form that I could learn from, and that's why I wrote *Game Changers*. It comes down to 46 laws that high performance people do into three big buckets. You pick the bucket you care about, you

pick the law that resonates with you and they give you the exercises to do right there in the book that tell you whether you want to pay attention to that or not.

Dave:

It was a huge amount of work to write this one, but it's got the most knowledge that I could possibly cram into a single book and it's something that you will be able to refer to over and over. It's called Game Changers, it's on Amazon now, check it out.