

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 squid goo could actually be a good thing for you. It turns out the Hawaiian bobtail squid has a secret weapon that protects their eggs and their offspring, a bacteria that fights fungus. Bacteria that female bobtail squid deposit in the jelly around their eggs can fight off a fungus called *Fusarium keratoplasticum*, researchers found.

Which is kind of cool, because *Fusarium* is one of those species of fungus that causes problems in crops. It also makes Ochratoxin A, which is the stuff found in a lot of coffee, a lot of corn, most beer, wine, and most things that causes problems in our bladders, and kidneys, and mitochondria as human beings.

Researchers at the University of Connecticut in Storrs treated squid eggs with antibiotics to kill the bacteria, and those eggs grew super fuzzy with fungus, and the squid embryos died. It turns out, though, that the bacteria that are present make lots of different anti-fungal chemicals, including a bunch that no one has ever noticed before. Some of those things inhibited other bacteria, and other fungus, including *Candida albicans*, the stuff that causes yeast infections in men and women.

It looks like squid bacteria may one day be a source of new kinds of antibiotics that are natural, or even antifungal drugs. This stuff is kind of cool, because as we are rapidly depleting our biodiversity, we're realizing that we haven't even measured many of the species of bacteria that are floating around in the oceans, that are all over the place, much less what's even going on in our gut.

So little experiments, little observations like this are, to me, making me think "Wow, we really need to start cataloging, and archiving, and getting an understanding of what's going on in the world. Because the world is changing, and we're not always going to have all of these bacteria floating around." Even the squid.

If you like Bulletproof Radio, and you probably do, since you're listening right now, I would love it if you went to [bulletproof.com/itunes](https://bulletproof.com/itunes), which will take you straight to the Apple site, where you can leave a review for the podcast to tell people that it's worth their time to listen to. I work every day to make sure this podcast is worth your time to listen to.

This year, we're going to cross 100 million downloads, which means if I've been wasting time, then I wasted 100 million hours ... That's a whole lot of lifetimes. So I like to think the show is doing something good. If you agree, let me know by leaving a review. [Bulletproof.com/itunes](https://bulletproof.com/itunes).

Today's episode is an in-person interview conducted up here at Bulletproof Labs Alpha, on Vancouver Island, which is kind of cool, because I love being able to look eye-to-eye with someone, instead of just doing it remotely, which I do some of the time. We're going to talk about a soccer ball-shaped molecule made of 60 carbon atoms.

You might have heard of something called a buckminsterfullerene, or a carbon nanotube, and things like that. It turns out that there are some really interesting biological properties in this kind of molecule that are applicable to you, at least if you like to perform better, be able to eat less food and still have lots of energy, and have all sorts of other unusual biological effects.

I've invited a guy who has lots of medical patents under this space. His name is Ian Mitchell, and he's the Vice-President of Research at Carbon60 Plus, who's going to talk us through the science and the implication of this work on human health.

Before I introduce him to you, I've actually used Carbon-60 molecules going back almost 20 years, these came on the market. I tried some because they were a promising anti-aging technology. I tend to find the newest stuff, and I tend to try it. All I felt was sort of tired, and a little weird, and said, "This isn't something that I want to play with."

I told Ian the same thing when I first met him, and he said, "Well, times have changed a little bit. You need to try this again." I was pretty darn impressed, which is why he's on the show today. Ian, welcome to the show.

Ian: Ah, thanks Dave. Thanks for having me.

Dave: Let's talk about Carbon-60. I knew that you were not expecting me to say that, but for people listening, it just sounds too weird. There's some strange group of carbon molecules ... There's carbons everywhere in our bodies. Why is this special, and why did you start paying attention to it?

Ian: Well, I'd say it's special because it's been around since the Big Bang. It's one of the base compounds that's been floating around basically forever. We're built on a carbon backbone, and so it's very biologically compatible.

It's special because, in the capacity we've been using it, we bind it with fats, and that makes it more bioavailable, so it can actually elicit different effects in your body.

Dave: You're saying we bind carbon with fats?

Ian: We bind carbon with fats.

Dave: But that's pretty much what ...

Ian: [crosstalk 00:04:48].

Dave: That's what fat is, right? But why is this new, unusual shape something that we're just talking about. Haven't we always eaten things like charcoal? And carbon is the basis of our food supply.

Ian: Yeah, we have. Historically, people probably had better health because that was in their environment. They were exposed to small amounts of this, in very trace quantities, and had been probably for millennia, as long as people were cooking on fire.

Dave: So this unusual molecule, and we'll get into what it actually does inside the cell ... It's been present when we were eating charcoal from fire, and just cooking on fire. We were getting small amounts of it, but small enough amounts that you think it was biologically useful, and now it's out of our food supply? So this is sort of putting something back in that was always there, or are we doing something else with it?

Ian: Well, I'd postulate that there's probably a bit of that that had an impact, because it really doesn't take a tremendous amount of it to have an impact on your physiology.

Dave: All right. Let's assume that when we burn stuff, some tiny fraction of the charcoal left over is going to be arranged in an atomically unusual configuration. This is something that Buckminster Fuller, which is why it's called fullerene, he proposed that this was possible, but we didn't actually see it. Then he discovered that it was possible, as far as I understand.

Ian: Actually, it was ... Bucky Fuller ... The three fellows that got the Nobel Prize for identifying fullerenes in 1985, they named it after him because of the similarity to the geodesic domes that he had put out, I guess back in the '40s and '50s.

Dave: Okay.

Ian: Really, it was the ... Kroto, Curl, and Smalley were the three fellows who identified it in '85 and got the Nobel Prize for it in '96, and it had been talked about. In chemical circles, people had postulated that there might be something molecularly like that in the '60s and '70s, but nobody had really identified it until the mid-'80s.

Dave: So there was a postulation, then in the '80s we figure this out. When you think about this, mid-'80s, we're talking 30-something years ago.

Ian: Yeah, but in chemical terms, that's hot off the presses. [inaudible 00:06:51].

Dave: It's true, and what the internet's doing is it's speeding up the amount of research possible. Going back in the '90s, this has been known for 10 years. People started making, I would say, probably low-quality stuff. I said, "All right, let's look at this." Because the research on animals was pretty amazing.

Ian: Yeah, there have been some really great studies. I think the most profound study, that really got a lot of people's attention, came out in ... or it was published in 2012. It was a fellow named Fathi Moussa, and the paper was Baati, et al. But it showed that they had increased the lifespan of rats by 90%. It got a lot of pushback, because people thought "90% increase in lifespan ... that's preposterous. They must have had some errors."

Dave: Lifespan is kind of important.

Ian: Lifespan. Yeah.

Dave: Explain that for people.

Ian: Well, let's say that a normal rat would have lived, let's say, two-and-a-half years. Well, these rats lived five years. Or close to five years. It really was almost double the lifespan. And there was ... There was a tremendous amount of pushback.

In our lab, we actually re-did a similar experiment. We were looking more for anti-inflammatory effects, and trying to take things a bit further than the guys who'd done that original study did. Because they were doing the study to look at mortality curves, right? It's called an LD50. The lethal dosing. Where you're trying to figure out how much of something does it take to kill off 50% of the population. What they found was it didn't actually kill them. It made them live far longer.

In our lab, we were working on an anti-inflammatory product, and so we were trying to see what would happen. We took p53 knockout mice, which are lovingly termed "cancer mice." They have the p53 tumor-suppressor gene extracted genetically, and then they don't have anything to stop the growth of idiopathic tumors. Just spontaneous tumor progression.

The strange thing that we found was we didn't get rats with tumors, with the exception of one had a tumor, but it didn't die from it. It actually died from a hemorrhage. But they lived 93% longer, and a three-percent variance on two totally separate studies is a little too tight to be just happenstance.

Dave: What you're saying, with a little bit of lab terminology there, is you were trying to give mice enough Carbon-60 molecules to kill them, and they lived twice as long as they are supposed to live, and these were mice that were actually genetically engineered to die of cancer, but they didn't.

Ian: Well, yeah. In our lab ... The first study they were trying to figure out the mortality of them. In our lab, we were trying to get some really heavy-duty anti-inflammatory effects. And we did. But we've taken it a bit further, because in that first study, the idea that you're going to magically arrive at what is the optimum dosing, and the optimum structure of something to yield a biological effect ... It's kind of like winning the lottery. It's probably not going to happen.

Over the past six years, that's what we've done. We've worked with lipofullerenes, which is adducting or binding a fat to the Carbon-60, and then trying to figure out how to enhance the effects. We've done it across a whole host of different products, the first of which was a joint supplement for dogs, which is a bit of a misnomer, because it's really far more than just a joint supplement for dogs, but that's actually how it's billed.

Dave: What you're doing ... In the original stuff that I bought, years ago, they would take olive oil ... And I don't even know if it was real olive oil, because there's a big problem with fake olive oil right now ... and then they would dissolve these fullerenes in the olive oil.

It had a light purple color. You'd take a teaspoon or two of it, and then for me, I would just get tired, and sort of feel odd. It just didn't do anything. I said, "All right, this isn't probably the right technology for me."

The newer stuff that you're doing, though, you actually found enough animal data that you could release it for dogs. Full disclosure, I've been giving it to my 13 year-old dachshund, Merlin, and he's doing pretty well, actually. He's been blind since he was two, so he's still blind. It didn't reverse a congenital condition. But he walks around wagging his tail, and ... walking into the wall, occasionally, but he's a happy, pretty darn healthy dog for his age. I did see a difference after I started doing that for him. I have no issue with using pet supplements, so I might have added some of that to my supplement regimen.

Ian: Well, I take it every day, and have for the past six-plus years. I was definitely the first guinea pig. Really, it had such a profound effect on me, I used it on my dogs as well, and got great effects on them.

One of the partners at our company, who's in his 70s, he started taking it because he had rheumatic fever as a kid, and had really, really bad arthritis in his hands. In terms of the anti-inflammatory effects, after literally just a few months, he had no arthritis. The swelling was gone. For myself, I didn't really have any serious physical issues, other than some sore joints and occasionally a couple of things that I might sprain running, or something like that, but all of those things have subsided.

Dave: It's interesting. I've done everything that I can find there's research for that makes you live longer and turn those things off. I eat an unusual diet. I know you do, too. Clearly, the Bulletproof Diet. I mean, go figure. But I mean, just handfuls and handfuls of technologies and pills. The stuff at Bulletproof Labs, and all of that stuff. A lot of times, I'll say, "Well, how do I know that this one thing worked?"

What I've come to believe is that it's impossible to do a single-variable test. What we'd like to do, is we'd like to say, "Oh, we excluded all of these other variables, because we have to know which one thing worked." But you forgot these variables like the outcome of a test in mice changes entirely based on whether a woman or a man is feeding the mice. There's great data that supports that now. We're like, "Oops! We didn't isolate that variable."

So what we do is we create this amazing story in our minds that we isolated all of this things. "Oh, did you notice if the moon was waxing or waning?" You could say, "Well, what does that matter?" "I don't know, ask farmers." It actually matters! In all of these things, I think it's actually a little bit of hubris scientifically.

My approach has been, "I'm going to do all of this stuff." But in terms of things that actually extend lifespan, this is some of the strongest data of anything I've found out there.

Ian: It's kind of impressive. Initially, we really weren't going for lifespan. That was-

Dave: Why not?

Ian: Well, because it seemed like there were more pressing concerns, like all of the ailments that are really due to inflammation. Because there's a huge amount of them. I mean, some NIH studies say that over 80% of all chronic ailments are due to inflammation. There's a bit of question as to whether that's correlation or causation, but there's definitely a big correlation between a great number of them.

Dave: Knocking out inflammation is at the core of what I'm doing to live a long time, and just feel good and perform better. Usually, that inflammation is coming directly from mitochondrial dysfunction. You don't get inflammation when you have perfect mitochondria.

Ian: Yeah, and we actually took a lot of steps to try and figure out how exactly those mechanisms were working. And mitochondria, since they're the powerhouse of the cell, that was a big component of it, was to test it and see what kind of effects were we having on ATP production? What are we doing to the ETC?

The results were, to my way of thinking, kind of surprising. I mean, with our particular stuff, we started out with a standard approach to Carbon-60 and lipolysing it. And it worked well, just like the other things. But we then enhanced it. In order to get the patents issued ... The Patent Office rebuffed us initially, and said, "Listen, you're taking four anti-inflammatory antioxidants and combining them. That's nothing new." We actually had to show, via lab data, that the way we were doing it, we got a 223% yield, so it was pretty profound. After we showed that with university testing, they said, "Okay. Granted."

Then we did a couple of clinical trials, and the like. But it was a different response. Mitochondrially, we were able to very clearly show that we got an uptick between 18% and 58.3%, which is very pronounced.

Dave: Production of ATP?

Ian: Yeah, production of ATP.

Dave: Now, that's why I heard about your stuff, and when we first talked and met in Austin, I said, "All right, I'm going to try this stuff. I'll try it on my dog, and I'll try it on myself, because I'm a guinea pig, after all." There's definitely something going on that's profound.

The idea, for people listening, is that if you can do anything to make your mitochondria work better, you're going to like how you feel right now. You're probably going to reduce your risk of every degenerative disease out there. That's the whole thesis in Head Strong, my book. Here's this technology that was only first discovered in 1985, that was basically tossed around the dark corners of the internet in the early-'90s, and I would say largely forgotten, even in the anti-aging research ...

Ian: Agreed.

Dave: ... work that I've done in the Bay Area, we talked about this once maybe, and sort of said, "Nah. Just doesn't seem to work." But you went through, and you've got multiple patents issued for drugs, and things like that that you've sold to different pharmaceutical companies. But you spent six years digging in on this stuff. What made you think there was any meat on the bone for this? Because I think most of anti-aging missed this.

Ian: Initially, the first round of experiments I did on myself, I could feel the difference. After feeling the difference, I thought, "Well, there's definitely something here." One of the fellows at the company had been working with fullerene since the '90s, when he was getting his PhD, and so we talked about it a bit, and continued to develop it to see what we could do.

There's so many things. I mean, we've been able to reverse hair loss, which is ... It's a degenerative issue, almost, because when you lose mitochondrial function, you start dropping in production, and your body doesn't necessarily prioritize that particular thing.

So we were able to reverse that, and we were able to inhibit people feeling pain from shingles, and blocking neural conduction, and a whole host of responses that are just not normal. But truly, the thing that made me feel like there was meat on the bone was actually feeling a difference, because you can. You can sense it pretty quickly.

Dave: What you did is you cooked some up in your lab?

Ian: Yes.

Dave: And you said, "I think I'll try this."

Ian: That's basically exactly how it went down.

Dave: Wow. The story of discovery like that. It's kind of funny. I mean, that is how Bulletproof Coffee came to be. There was no research showing that the specific type of MCT that we're using, which is only one of the four types ... There was no lab data showing that it was any different. "But I can feel this difference. We're going to use this one." And now there's a ton of lab data.

What I think you're doing is you're saying, "There's some really old lab data. I tried it. I observed a difference ... " That you didn't believe was placebo. So then you did a whole bunch of animal studies that showed that it didn't appear to be placebo. So I'm going to ask you this, Ian: How long are you going to live?

Ian: Well, there's a bit of contention about the length and duration of lifespan at the office. I, personally, think ... and this sounds like hyperbole, which is one of the reasons that we

don't like to talk about it much. But personally, my take, is it should very easily be a couple of hundred years.

Everybody will pan me for saying that, but just based on the studies, I think that's very doable. Because it's a ... the term would be "punctuated equilibrium." Things don't necessarily happen on a smooth incline. Sometimes there's something that spike the curve. I think that lipofullerenes, Carbon-60 bound with fats, I think that's one of them. I think that's something that's going to make a massive shift in people's aging, and their lifespan.

And more importantly, their health span. The idea that we're going to be able to be stronger longer. Because I don't particularly want to be 180 year-old raisin that is feeble and falling apart. I want to be ... I know that's your number. Mine's actually a little bit higher than that.

Dave: Mine's 180 or more.

Ian: Okay.

Dave: [crosstalk 00:19:01] a floor. I'm not putting a ceiling on this, right? Like, let's race.

Ian: Happy 180th. Final birthday.

Dave: And you're what, about 82 now?

Ian: Yeah, about ... Yeah.

Dave: No, just kidding. How old are you now?

Ian: Fourth of July, last week, I turned 46.

Dave: Okay. Awesome. So we're about the same age.

Ian: Yeah.

Dave: You're looking pretty healthy. Your skin-

Ian: I [crosstalk 00:19:19].

Dave: ... is looking good. If you're listening to this going, "Good God, there's a dizzying array of anti-aging things out there. How do I know what to do?" The bottom line is, you're probably not going to do all of them. Even I'm not, although I'm going to come really close. Including all sorts of weird stem cells, and things like that.

I'm doing that partly because I want to know what it's like to do all of those, so I can share that with you. And also, I would be very happy to be the first 180 year-old doing something fun when I'm 180. I don't know if I will be, though, because I don't think

that's crazy. We know we can do 120 without all these new technologies, but not everyone can.

Given what we know now about how to inhibit some of the things that are going to take you out ... if you just look at the odds, half of us are going to get Alzheimer's disease if we don't do something about it. I think I've got that one licked. Right?

There's the whole cancer thing, which while we know a lot about mitochondria and cancer, and fungus and cancer ... So what I'm doing is I'm reducing my risk of all of these things that are going to screw up my health now. The things that did screw up my health when I was younger.

Which means I have a much greater chance of making it to 120, and along the way, I'm counting on only a 50% extension over the next 100 years! And here we are sitting down today talking about something that in my lifetime actually doubled the lifespan of rats. If you're listening to this, I'm hoping your mind is blown, because this is not science fiction. This actually is a study that's real and has been replicated by the guy sitting here across from me.

Yeah, I take this stuff. But here's the question. It is for my dog. What are the-

Ian: Right. And my dogs.

Dave: What are the bad things that happen if people were to take Carbon-60? Or animals, or anything else? Are there side-effects of this kind of technology?

Ian: None that have been identified as of yet, and I would very definitively be the canary in the coalmine. I mean, I take a tremendous amount of the stuff. I fluctuate it, because I think that there's a hermetic response, and so I don't take the same quantity every single day. I try to keep my body active, and guessing a bit. But I would be the canary in the coalmine. As of yet, nothing. I have no ill effects. In fact, I feel stronger than I did six years ago.

Dave: So what we're proposing here is this is a possible technology that might, at a minimum, make you stay healthier for longer. If that's all you got, great. If it does even some fraction of what it does in mice, that would be amazing. But I wouldn't bet on just one thing to do it.

Talk to me about the biochemistry of this stuff. These are tiny little carbon spheres. They're bound to fats, and what our body does ... and people who have read *The Bulletproof Diet* and *Head Strong* know something about this. But your body takes fat, and that's what makes cell membranes. It's tiny droplets of fat make the outer membrane of your cell. They make the mitochondrial membrane. They make the lining of your nerves. They make a lot of your brain. They make your hormones.

So there's fat droplets throughout your body, but now these are impregnated with these tiny spheres. What's different when the spheres are present?

Ian: You make it lipophilic, so you bind it to the fats, and then that's-

Dave: That means "fat-loving." Stuff that sticks to fat. You have "lipophobic," which means "repels fats." Water would be lipophobic, for instance.

Ian: Yes.

Dave: And then "lipophilic: loves fats."

Ian: You bind it, and that allows it to have the all-pass access, so that it can go through the cell membrane. Once it goes through the cell membrane, the mitochondria actually pick it up because there's a gradient change in the electrical charge on the surface of it. So it goes down, and it binds to the surface of the mitochondria. There's a great NIH paper on that that really defines everything.

That mechanism isn't terribly shocking. The effects are kind of shocking, but the actual mechanism biochemically, whereby it gets to the mitochondria is pretty cut-and-dried. We've actually, over the past five years, we've been working on another process that ... getting to your point about living longer and not degrading, and not having diseases of aging ... We developed an anti-metastatic therapeutic that, thus far-

Dave: That means "anti-tumor."

Ian: Yeah, so it stops the spread of tumors. Most of the people who die from some sort of cancer die because it metastasizes, meaning it just moves to some other portion of the body ... distal metastasis. We were able to completely inhibit that, going back to showing that if you can enhance mitochondrial function, at the same time you drop inflammation, you can really get some terrific effects.

There are plenty of studies that back that up. Johns Hopkins came out with a study last year. The Catholic University in, I believe, Bilbao, in Spain, came out with one as well. They have all of the different components, but we put it together with a mechanism that actually works.

Dave: Now, that's only in the lab, though. That's not a product for-

Ian: It's not a product yet.

Dave: ... for humans or pets. But it's the sort of thing you're seeing. We know a huge number of cancers are mitochondrial in origin, and maybe two or three percent are genetic in origin. Then, I think there's actually a fungal connection with some of the other ones that are left. You're able to whack a bunch of these in the lab, and-

Ian: Yeah, we've done 20 different types of cancers. Granted, there are hundreds of different types, but we did the primary ones that people are really concerned with. We've actually done it both in cell cultures and in vivo in rats, mice, and dogs. We're doing some ongoing studies. It'll be quite a while before it actually makes it to people, but-

Dave: And that would probably be a full-on pharmaceutical drug.

Ian: Yeah, we'd have to file all of the proper paperwork with the FDA, and continue to pursue it. Which I think is probably forthcoming.

Dave: We know about the Warburg effect, and we know that cancer can be radically changed by increasing mitochondrial respiration. You've heard podcasts about ketones and cancer here on Bulletproof Radio. You've heard podcasts about hyperbaric oxygen, and ketones, and cancer. Guys like Dominic D'Agostino have looked at that.

What we're doing there, is we're hacking cellular respiration to make it so cancer doesn't work very well, because it's anaerobic, and we're turning on aerobic metabolism in cells when you make mitochondria function. What you're showing with the pet product, that is not the anti-cancer thing ... The one that's there for inflammation, mostly ... That what that's doing is it's getting the Carbon-60 nanospheres into the mitochondrial membrane itself.

Okay, so what? Now you've got a little carbon thing sitting there. What's that actually doing?

Ian: Well, it buffers oxidation. It's a supremely strong antioxidant. The studies that people cite vary, but the ballpark number would be about 270 times stronger than Vitamin C. Which is, in and of itself, a pretty good antioxidant. If you have something that blocks oxidative stress on cells, you end up with all of these effects ... You're making the mitochondria function more efficiently. So it's not that you're actually adding in, you're just plugging the holes in the bucket.

Dave: Now, there's some studies that show taking antioxidants, especially Vitamin C, and the chemical form of Vitamin E, inhibits the benefits of exercise. So when you exercise, you actually don't benefit, because you need oxidative stress in mitochondria to cause them to become stronger. But if I semi-permanently impregnate them with these little Carbon-60 nanospheres, is exercise going to quit working?

Ian: My hypothesis would be no, because it hasn't for me over the past six years, and I've impregnated my mitochondria quite a bit. But I do think there's some validity to the idea that if you take too much, too consistently, you'll downregulate all of your endogenous systems. I still want my body to produce glutathione. I don't want to diminish SOD2 production. I want to make sure that my body's still on track.

But I do think there's some validity to the idea that you have to balance it out.

Dave: When people are experiencing inflammation, there's usually extra reactive oxygen species in their cells. There's different types oxygen species, some of which are really good for you, and some of which, like peroxynitrite, are particularly bad for you.

I had [Tyler Gage 00:27:19] on, who was talking about hydrogen, and breathing hydrogen. Or putting it in your water, which is something that I'm really interested in

doing. What's interesting there is it turns off the "bad oxidants," and things that cause damage, but it leaves the good ones, which are the signaling molecules that you must have in order to have healthy mitochondria. Do you have any lab data on your Carbon-60 stuff that talks about which free radicals you're suppressing when these are basically onboarded as part of the cell, called a cellular upgrade?

Ian: Actually, we don't as of yet, but we've been looking at, and I've been taking personally, some of the activated hydrogen stuff, because there are some definitive correlations between the two. It's a little bit of a crib sheet, in that I can look at their studies, and see "What are they testing for?" Because I think there's going to be a lot of parity between what's happening with hydrogen, and what's happening with carbon, internally.

Dave: Do you think there's a synergy? Should I be continuing to breathe my hydrogen and eating my pet supplements?

Ian: I don't. I think in a short-term sense, it's been my experience, and also from just looking at the chemistry of it ... Short-term, yeah, you'll get a little bit of an energy boost, but long-term, the problem is if you saturate the carbon molecule, you're going to lose some of the really long-term beneficial effects. I don't think it's worth the sacrifice of losing some of the antioxidant behavior long-term for the short-term energy boost.

Dave: The short-term energy boost from doing what?

Ian: If you take the hydrogen, my experience was taking the hydrogen while taking the Carbon-60 fullerenes in conjunction with one another ...

Dave: Might be too much.

Ian: Yeah. It's a little overdone. You do definitely get an energy boost, but long-term, I think it's probably going to negate the real benefit.

Dave: Well, part of my anti-aging complex Rubik's Cube of a strategy here is I regularly use ozone therapy. Ozone produces a spike in free radicals in the body that creates all sorts of free radical signaling molecules that causes mitochondrial biogenesis. They actually make you grow new mitochondria that get rid of bad ones.

So it's kind of like intermittent training for your mitochondria. It says, "You better be ready to handle this load of oxidative stress, and if you can't, it's okay to die and get out of the way so a young mitochondria can come in." Perhaps the deal is you must cycle these things anyway, so you cycle these things ... Maybe you do the Carbon-60 nanospheres for a month or two, and then you stop it for a month or two? Is that how you do it? Or how often do you cycle?

Ian: Yeah, there's a clearance period. I usually stop for a couple of days or a week at most, and I try and keep a fair amount of it in my system. But I do cycle it, and I think that's a necessary thing to do.

Dave: How long, if I take some of these fat soluble nanospheres, how long do they stay around in the body?

Ian: Everybody discusses different dates, and there's actually a lot of data that conflicts with one another, that I've seen a couple of different studies. Some people say there's a 92 hour half-life. Some people it's going to be a couple of weeks. I know from personal experience, and looking at some of the lab data in some of the animals, that that can't be exactly correct, because the effects are too pronounced over a long-term period.

It's also ... It's really difficult to gauge where in the body ... Even after you pull them out, and you break everything down, and solubilize it and run a column on it, and you try and check it out in the lab to see what's what, and where are these particles? It's difficult to find them, because they are, after all, nanoparticles. They are very, very tiny. The trace quantities that you see when things pass through an organism make it a bit difficult to figure out.

Dave: In my mind, I think about this ... so if one of these fat molecules is incorporated in your myelin sheath, the turnover on myelin is very low. It's going to stick around for a while-

Ian: That's exactly correct.

Dave: But if it goes into making a hormone that gets metabolized in hours, it's going to be excreted relatively quickly.

Ian: There's a huge component of importance to how well you interact with the cell membrane. One of the most pronounced things that we did over the past few years was to figure out ... and this was for our anti-metastatic therapy ... figure out how to increase the effectiveness literally 50-fold by just tweaking it so that we could get better interaction on the surface of the cell membranes. Because there's a molecular swap that happens there, and if you can get something in, and get something out, more effectively, you can increase the effective yield.

Because you don't ever want to have to take more of it than you need. It's the minimum effective dose, right? You take the very smallest amount that you can take to elicit the right response.

Dave: Do you ever just bathe in it?

Ian: All the time. That's why my skin has this luscious glow.

Dave: But, I mean, you're saying you take a relatively large amount, not necessarily the minimum effective dose, but that's because you're your own guinea pig.

Ian: Yeah. I'll do, on an average day ... like this morning, I did two tablespoons. Just 30 MLs, not really that much. Some days I'll do 100, 120. But those are more few and far between than my typical 30 MLs a day.

Dave: When you're feeding it to a dog, how many tablespoons per 10 pounds of body weight? What's the equation for that?

Ian: Well, for a dog that's that tiny, half a teaspoon.

Dave: Oh, for Merlin. My little [crosstalk 00:32:37].

Ian: For Merlin, yeah. Definitely, about half a teaspoon on a continued basis. Who does seem pretty spry. He seems like he's bopping around pretty well.

Dave: Dogs actually are dying way sooner than they ever have.

Ian: There is almost an epidemic of that. One of the reasons that we started working on the cancer therapeutic is because 80% of large dogs die from cancer, which is horrible. It's something that it absolutely is a problem that we can mitigate.

Dave: We could start by not feeding them that [crosstalk 00:33:06] crap.

Ian: Grain-based, horrific filler food. Yes.

Dave: Yeah, and so you just don't do that. One of the reasons Merlin is doing well, even though he's genetically pretty weak. He's overbred, you could say. He was on sale because he was a defective. He was the wrong color to be a show dog. But he also has had congenital blindness, hip problems, and things that don't lend themselves to long life, but he's also only been on a raw meat diet. He gets Brain Octane every day, and the right supplements and all. But if you feed a dog that kibble stuff, cancer is almost inevitable, it seems like.

Ian: Well, it's an inflammatory response. One of the things that we were able to do was really, seriously suppress ... and we did this with cytokine data. We checked the blood levels ... was to drop IL-6 and IL-8, which are two of the real primary markers for inflammation. When you do that, you get a totally different biological response. Animals seem healthier. They seem happier. They definitely have more energy, because literally a lot of the energy that's going to combat the problems with inflammation go away.

Dave: It's definitely something I've seen in Merlin, and for people listening, you want your dogs to feel better and not pester you for food? Put a little Brain Octane on their food. There's actually an old podcast about that on Bulletproof Radio. My guy gets about a half a teaspoon of your Carbon-60 stuff. He doesn't seem to mind it. It tastes like olive oil, and dogs will eat almost anything if you let them. If you could have a cat poop flavor, he would probably like it better. Just full disclosure, but ... dogs are gross.

Ian: Yeah, one of the things that was really hilarious in the first clinical trial we did, right ... about three days in, I got a call from the woman who was proctoring the trial, and she said, "We're having a problem. They're trying to lick it out of one another's mouth." Day one, they were a little bit reluctant. Day two, they ran up to the edge of the cages to get it. And day three, they actually tried to get it out of the other dogs' mouths.

Dave: Wow. So they know. It's funny with animals ... I interviewed Glenn from Alderspring Ranch. This guy's a soil biologist turned cattle rancher, who makes some of the best grass-fed beef I've had. He talked about how his semi-wild cattle will walk around, they'll find exactly the right tuft of grass for them. They'll bypass three others that look the same to us, but they just know, "That's the right one for me." Then by allowing selective grazing instead of just grinding it all up and feeding them pellets, that they were doing that.

So there is an animal sense, when animals know something is good for them, they'll do it. But other times, they'll just eat stuff because, well, it's trash. So I don't know that it's always ...

Ian: Yeah, if it's always good.

Dave: If it's always good.

Ian: It doesn't always have-

Dave: Yeah.

Ian: ... the most brilliant intention behind it.

Dave: Yeah, but when something's really good, they get a real focus on it.

Ian: Well, I've noticed a couple of times ... we were doing trials with horses, and the same thing. A little bit of reluctance on day one. By day two and three, they would literally push me to get to the serum. I'm a reasonably large guy, and I remember a 1500 pound horse coming up and moving me, very politely, to get to the serum. I felt like a rag doll.

Dave: Yeah, horses can be kind of mean if they're motivated for food.

Ian: It very much wanted to get to its oats and oil very promptly.

Dave: Now, this could have really big implications, not just for pet owners. Assuming that there is even a 10% life extension possibility for humans, that's a game changer.

Ian: Agreed.

Dave: Right? Does it make you a little uncomfortable that you had to release this for pets first?

Ian: No, it doesn't. I think we ... actually, we are massive animal lovers. LivePet is the parent company that holds all the patents and intellectual property for everything. Dan, the CEO, has done canine rescue for over 30 years. So we really are true to the name of the company. We're all about pets.

It doesn't bug me. We are releasing it for people in the next couple of months. They'll be taking the same product that I take, which is kind of an enhanced version of what the pets take. It's-

Dave: When do I get some of that? I've been taking the pet stuff! You've been holding back on me, Ian.

Ian: We'll hook you up.

Dave: All right.

Ian: We'll definitely hook you up.

It is a pronounced difference, though. We've come up with a couple of methods to enhance the strength, and the binding, and do membrane swaps, and it really ... You can feel the difference when you take it. It, to my way of thinking, puts a little bit more light in your eyes. As one of the people who was trying it out said, "It has more torque." Which was a good way to put it.

Dave: It's really hard to explain that if you eat a meal that's maybe delicious, and really ought to be delicious, but has all the right stuff in it, you get this sort of food high. It's not the MSG/sugar/caffeine food high. It's one of those things where you just feel more like yourself, and this sort of like, "I've got it!" It's hard to consciously create meals like that.

A lot of the menu stuff I do at the Bulletproof Coffee Shop ... I'm dialing that in pretty good, and people feel good on that. When I make food at home, I can probably 70% of the time get there, but it has to do with very subtle things, like ingredient freshness. The quality of the herbs you use. And when you get it all dialed in, you're like, "Whoa! I just ... I've got this."

It's that same feeling that I do notice when I'm taking probably closer to three tablespoons, given my body weight, of the stuff. Where there's just a little bit more spring. It feels different than the other mitochondrial enhancements I've done, where if I take Keto Prime, Unfair Advantage, or just Brain Octane, all of those are different pathways of mitochondrial stimulation.

And when I do those, I'm like, "Okay, I've got this." But it feels more in the brain. There can be a physical endurance, or things like high altitude stuff just doesn't bother me. Air travel doesn't bother me nearly as much. But there's kind of a background level of that that I notice from the C-60 that feels ... It feels different, but it's definitely an enhancement. It's more akin to a food high than a straight-up mitochondrial upgrade. Why? Can you even ... Does that even make sense?

Ian: No, it makes perfect sense, but I think we ... Obviously, we're a lab, so we try and be very quantitative about everything. But there's a certain element of it that I think there's really a pervasively qualitative ... You just feel stronger. You feel better and more enhanced. I don't know that we really have all of the data yet.

I think ... This is the same reason I started taking it without having all of the data in as to whether or not it is going to, in fact, enhance my lifespan and health span. By the time all the data comes in, and we have everything qualitatively [crosstalk 00:39:50] and quantitatively drilled down ... Yeah, I'll be using a walker. So rather than run that risk, I rolled the dice and thought, "Okay. We'll go for it now." As did pretty much everybody else at the company.

We all do Brain Octane like it's going out of style. Shameless plug for it ... I think that stuff is fantastic. Everybody in the lab uses it. We put it in the coffee. I put it on just about everything. I buy it in large quantities for the house. So hat's off for producing that stuff.

Dave: Thank you.

Ian: No, really. It's fantastic.

Dave: I've got to ask, can we put Carbon-60s in Brain Octane? Does it work? I know olive oil is what everyone seems to use.

Ian: A lot of people have been using coconut oil, but in my experience ... and I've tried in the lab to combine it with just about every type of fat you could combine it with. Some are fantastic. Actually, Brain Octane is really good. Some ... though I wouldn't recommend taking large quantities of it. Some are really horrific. Vitamin E and fish oil, DHA, EPA, they are truly the most disgusting things I've ever smelled when you combine them with fullerenes. And they turn a very strange orange color.

Dave: Is that because they go rancid?

Ian: No, they don't actually go rancid. Oddly enough, it blocks the rancidity. The oil is basically, from the time you mix the fullerenes in, it locks down oxidation. It might actually be the one way you could probably get some things to stop oxidizing over time. Because there are a lot of fats that break down really rapidly, and this actually inhibits the breakdown. That's why the shelf-life of the stuff, we always say it's about a year to two years, but really, as tested, we've seen it for over five years without any rancidity.

Dave: It's really funny how important it is to not allow fats to go rancid before you eat them, or even in the body, you can get damaged fats. There's an anti-aging technology that also came out in the '80s. It's something called BHT, or butylated hydroxytoluene. You see big campaigns that say, "Get it out of the packaging for packaged foods!" Well, you shouldn't be eating packaged foods anyway, like that.

But BHT was taken in the '80s for a long time for anti-aging effects, because they showed in mice substantial improvements because these rats didn't have lipid-based free radicals in their bodies. For many years, I would take a little bit of that, not necessarily an anti-aging dose, and I would add it if I was going to be cooking bacon, or cooking anything in fat. Just enough to keep the fats stable.

Ian: Yeah, we actually included BHT in our first patent.

Dave: Oh, no kidding!

Ian: Yeah, we did. Part of the reason is, we have one preparation that we use with a lot of BHT, because as you obviously know, there are a lot of other things that you can do with BHT, and a lot of effects on lipid-coated viruses, and some of the other things that are still kind of in stealth mode at the company.

Dave: We can straight-up talk about that. Herpes is a lipid-encapsulated virus. And BHT cures herpes. It costs about five cents for the dose that does that. The guy who wrote the first book on that, Steve Fowkes, is a dear friend, an advisor, and I would say his work on "smart drugs" is the stuff that has me sitting here today. He's been on the show a couple of times, spoke at the Bulletproof Conference.

You can search right now "herpes BHT," and you realize this thing which is just beaten up as the most horrible antioxidant ever, and food chemical, etc., etc. It has medical uses that are profound. However, there are some other studies that showed it might promote cancer, which is why it fell out of favor in the anti-aging crowd. What's your take on that?

Ian: I think that's 100% accurate, and I think if you were able to mitigate any of the possible tumorigenic phases that could accompany BHT, then you might end up with something that would completely eviscerate any sort of lipid-coated virus and not have any of the downsides.

Dave: I would say, given the damage from shingles, or herpes, or even chickenpox, that there's a case to be made for exposure for a couple of days to just stop the virus from replicating, where you're going to be a much happier camper with a lower overall risk of everything.

I've seen hundreds of people over the years, friends and just people I've met ... I'm like, "That cold sore? Why don't you try this." And three days later, like, "It's dry! It's gone. They're not coming back anymore. This has been a problem forever!"

Ian: Yeah, and it works. It absolutely 100% works. If you can just take out some of the negative effects that people had touted a while back in some of those studies, which I think at this point we have, you can end up with something that really has a tremendous impact on a lot of people who are, as you said, pretty much needlessly suffering through things.

Dave: So it's profound that this idea that what if we could stop fats from going rancid? Would it affect our biology radically? The evidence, I think, is in that says we really don't want fats to break down outside our bodies or inside our bodies. What you're proposing here is that your Carbon-60 technology might be a way to reduce the negative breakdown of fats in the body, in a way maybe similar to BHT, but without all of the other stuff that BHT does.

Ian: Yeah, and there's a whole host of things that you really do want some breakdown. I mean, autophagy is a great thing. You can elicit that in your body from intermittent fasting, and you want that, because it ends up with a stronger organism at the other side. You put your body into a fasted state. After three days, your immune system starts to rebuild itself and pump out new immune stem cells. Those are the kind of effects that you want.

Dave: But those don't involve basically oxidizing fats.

Ian: No, but one of the things that's kind of interesting, that we found, that correlated with this was there's a breakdown of some of the damaged tissues in the bodies and damaged genetics from the Carbon-60, which is something that we haven't published yet. But there were some inhibitions that happened on a genetic level because of blocking and transcription.

Dave: What does that actually mean? For the people listening, I'm not sure I got your point there.

Ian: No, and I probably ... I get called out occasionally for nerd-speak. What that means is, when there are problems in the cells, you don't want a copy. You want a copy of something that's strong. You don't want a copy of something that's damaged. We found that the damaged cells were getting cleaved, destroyed, inhibited by some of the C-60 in a couple of the configurations that we came up with. We could actually block the cells from replicating.

Which was one of the key components for working on the anti-metastatic therapy, was if you can figure out how cells replicate, and then you can stop that transcription process, where they copy themselves, you can eliminate really bad cells, over and over and over.

Dave: I've come to believe, as part of my quest to live past 180, that if you don't turn on regeneration ... You don't turn on autophagy, you're not going to make it. You have to be able to grow cells like a young person. But I also know from talking with cancer researchers and the other half of the anti-aging crowd, you turn on young people's regeneration, and your older, your risk of cancer is just going to go up. You almost have to combine some anti-cancer, mitochondrial-focused approaches as you turn on regeneration, or you're going to end up looking young, but with tumors-

Ian: That is what our data supports.

Dave: Okay.

Ian: That is probably all I could actually say about it, but yes. I would agree, and that is what our data shows.

Dave: Well, arguing with data is lots of fun.

Ian: It's my personal experience, too. Again, I feel much better than I did, but having seen in some of the animals that we've worked with that had tumors ... the response curve ... I haven't seen anything else where you can actually give something that has a chemotherapeutic effect, where the tumor just gets obliterated over the span of a few days, and yet the animal is stronger and healthier.

Dave: I've got to ask you something here. I mean, you have a strong career history of just inventing technology in multiple fields-

Ian: True.

Dave: ... creating patents being acquired by all sorts of different companies. So you're a serial inventor, and I'm just going to say this as a compliment, a bit of a mad scientist.

Ian: Thank you.

Dave: All right, good. You took it the right way, there. Carbon-60 is a tinfoil hat realm kind of technology, to be honest. Just in terms of-

Ian: Yeah, no. That's totally true.

Dave: ... credibility. In terms of its history. It's relatively new, and "real scientists don't do that." Right? But you're yet applying real science to this stuff, and now you're looking at, "Oh, obliterating tumors in two or three days! That's not possible!"

Ian: Well, and as long as we keep telling ourselves it's not possible, no one will solve that. When I was a kid, my dad would have me run this exercise. He said, "If you're trying to solve a puzzle, and it hasn't been solved, project yourself into the future. See if they've done it, and then bring back what they did."

Which sounds sort of esoteric, but it was a really good exercise, because you think, in 100 years, is this really going to be something that somebody hasn't fixed? Absolutely not. At the pace of change we're going through, using machine-learning, looking at correlations that people heretofore haven't been able to really grasp? No! That won't be an issue. So why not do it now?

Dave: I couldn't agree more on that. Someone has to go first, and the Wright Brothers, before they flew, that was something you can't do. Even before then, one of my favorite things when they invented the automobile, there was a group of real scientists from universities who said, "If you go over 36 miles an hour ... " It might have been 32, but somewhere in the 30s ... "It'll suck the air out of the car, and you'll all suffocate." Because no one had ever gone that fast! And they were making serious arguments about all of this.

Ian: That is fantastic.

Dave: But the truth is, we just don't know, and the deal is someone has to do it. The same thing on anti-aging. Yeah, someone has to live to 180 years or longer. I'm happy to do it, and if I die trying, it's okay. If I only make 140? I'm pretty sure I'm going to feel good along the way, and that's the whole point behind this.

How do you deal with the scientific critics? I mean, you have to have all sorts of people who are saying, "This is such bullshit. Carbon-60. It's never going to work. It's voodoo venom, and-

Ian: There's a ton of that. Actually, we partnered with a university a while back, and submitted for a grant for an anti-cancer therapeutic. When it was reviewed, all those applications have to be reviewed, and it went to the reviewers, and they shot it down.

The fellow who was with the university was livid, because he had been at one of the top cancer institutes in the country, and he's been doing testing for us for years. He's well aware of what it does and how it works, but it got shot down. The reasoning was basically, "You can't do that. That doesn't work. So that's not what it is." Even though there were literally pictures of animals before with tumors, animals after, without tumors. It's still so far outside of the realm of normalcy that it just isn't accepted.

But again, that's people's mindset. If you're not willing to take a different approach, you're going to elicit the same thing over and over. That's the definition of insanity. We're trying to push the bounds of that a bit. It's Einstein's quote of "What's more important: imagination or knowledge? It's imagination, because it tells you what can be, not what is." I would like to think that we're pushing the bounds.

We are going to take a lot of criticism. I think over time that will subside. It's the first 20 years where people think, "That's preposterous! It can't possibly do that." Then the next generation goes, "Well, of course it does that."

Dave: It's a very interesting thing happening in science, where you get a group of people who say, "That can't happen, therefore it didn't." Even when they're shown evidence that it just did happen. But they're willing to reject or somehow edit the information out of their consciousness because they know it can't be. Then that follows up with something ... I think might even have been Asimov who said it, who said, "Extraordinary claims require extraordinary evidence." What's your take on that?

Ian: I think that's true. I really am very much open to people ... I want people to do the research. I want more groups doing the research, because it's so rife with possibility that if a lot more people were looking at it, they would definitely come up with the same results.

There might be some variations on it, but I know that the core of what we're doing here ... I've seen it so many times, and have spoken with so many people that have had pronounced effects. I mean, literally, the CEO of the company with his arthritis ... that's not the only time. I've seen that dozens of times at this point, where people are so shocked that something actually works.

Dave: I hear that "extraordinary claims require extraordinary evidence," and I think it's total bullshit. Here's why: we're in the realm of science. Evidence is evidence. The extraordinariness of the claim is just subject to the visionary level of the person who's looking at the claim. There's no such thing as a quantification of how extraordinary a claim is. All that is is an ego-bias, and it needs to be stomped out of science-

Ian: That's a pretty valid perspective.

Dave: It is an evil thing. It's a dogmatic, nasty approach, and it's held human progress back for centuries. The deal is, "Look, we thought this was true. We found one provable, repeatable case where it's not true. Therefore, our theory, while useful, is not 100% accurate, and now let's go look at how it really works." It's that stupid, human thing that we do, where we say, "Oh, no. No. I'm going to deny the evidence, because it's not enough evidence to meet the bar for me not to believe the other stuff I believe."

Ian: Well, that happens in the sciences all the time. I mean, I feel bad for the guys, Pons and Fleischmann, who did cold fusion way back when, because it has now resurfaced as low-energy nuclear reactions. There's over 1500 verifiable experiments where they can document the same effects. Now, it's not 100% yet, but it's definitely enough that people should take a look at that. They may or may not prove it out to be accurate, but they should at least look at it, rather than ridiculing it.

Dave: Yeah. The idea of ridiculing something like that, it's like, "No!" I can tell you, I still think homeopathy might be kind of bullshit. Right? However, I know people who are Johns Hopkins ENT surgeons who said, "My people aren't getting better. I'm going to try everything out there, even the stuff that shouldn't work." And they try homeopathy, and they get results. I've seen results that are pretty amazing, and there's lots of studies now. I don't know the mechanism of action. That doesn't mean that it doesn't work.

Ian: Right, well that's the hubris of people is to think that we're going to understand all of the different mechanisms. I mean, we're pretty early on in the 21st century. Flash-forward a couple of years, maybe the 24th century, and people will go, "Well, of course that's the effect you'd get. Ha!" They'll look at us like we're doing leechings or something like that.

Dave: I really encourage ... because thank you, internet ... it's really easy for things like that to be outed if there really is something that cannot be replicated. We say, "Oh, you're trying to do this in every other lab, and it just doesn't work." That means one of two things happened. There's some variable that no one noticed in the first study. There was a mistake. Or there could have been outright scientific fraud.

These things do happen, but I would say, given what's going on with C-60s, and the fact they've been around for 30 years, there's definitely something going on that's interesting. I'm hopeful that people who listen to this, who are of the skeptical mindset ... the bottom line is, in my mind, this has passed the "One person talked about it in a dark room somewhere, and maybe it's cool," to the point where it deserves scientific mention.

It's unacceptable for people to say, "That can't work, therefore it doesn't." Any time you see that, whether it's in NIH, in a corporate research laboratory, you need to just grab whoever says that by the shoulders and shake them, and say, "What are you saying? I thought you were a scientist."

What you can say is, "I don't understand the mechanisms of action." The right answer there is, "Oh, you want a mechanism? Leprechauns! There. You've got a mechanism, so can we study the effect now?" Because if you can see the effect, and there's no plausible explanation, that's the coolest effect of all.

But we have this weird thing, "If I don't know how it works; therefore, it doesn't work." That's just wrong thinking. Somehow, Ian, you just don't have that. I want to know, what did you parents do to you? Why are you a mad scientist?

Ian: Probably biofeedback at an early age-

Dave: Of course ... I went and asked that earlier. Okay, so your parents hacked you when you were a kid. Do tell.

Ian: Well, when I was about 11, I started having really bad headaches, like migraine headaches, three to four times a week. I was a reasonably bright kid, and I paid attention to a lot of things, and I think I was just a bit overloaded. So I had scans run, and tests run, and they couldn't find anything that was really awry.

On a whim, my dad said, "I've read about this new therapy. Let's take you to biofeedback therapy." So I started doing biofeedback a lot, and I learned how to control all of my autonomous nervous system functions, and really regulating things.

And I got very dialed in, and was completely able to eliminate the headaches, and any time something would start to shift, and I could feel one coming on, I could just shut it down. Then that was a really solid precursor to starting to meditate and really trying to tap in a bit more. So those have ... If I had to isolate one event, I think that would be it.

Dave: I've met about a dozen people over the past 10 years who are just remarkable people. They have their heads on straight. They've thought differently than everyone else. And I had a chance to ask similar questions. Those dozen people I'm thinking of, they all said, "Well, yeah. My parents worked in some lab, and I did biofeedback as a kid." I'm not kidding.

It seems to create unusual adults years later. That's one of the reasons that, well, I run 40 Years of Zen, so my kids get neurofeedback at least twice a week. I have no idea what kind of aliens they'll grow up to be, but I hope it's the best kind.

That's kind of cool. So that just taught you to think differently, because it's cool to be a mad scientist in one realm, but you're a cross-functional one, where you've done multiple fields worth of things that are worth patenting. So-

Ian: I'm very, very curious, and very interested. A lot of times, I always joke about writing something called Reinventing the Oval, because most times people don't even realize that the systems that we've inherited aren't really functioning the way they should be. We just do it because that was the way that it was initially done. There's so many things that can be optimized, and so many things that we could do better.

I mean, as a species, the internet is fantastic, because it's really able to push us and connect things. I mean, the pace of change ... Everybody talks about the pace of change over time, and what's really amazing to me is it's actually going faster, because it's no longer just a function of more people.

If you look at the past, technology expanded at the same rate that people expanded. So it looked like it was this big function. Now it's actually expanding as a function of the population and the communication, so it's this cubic function that's happening in three-dimensions, and it really is ... For the first time ever, we have the ability and the capacity to see things that people have never done before.

Dave: I think it's the most exciting time ever to be alive. The ability for something to go in only 30 years from, "Hey, look what I noticed!" To "Hey, people are giving it to their pets and feeling better." I think it's cool. I'm grateful that there are mad scientists like you out there-

Ian: I very sincerely appreciate that.

Dave: Yeah! I mean, spending six years developing something like that, in a field that honestly, if you hold your hand up and say, "I'm going to be doing research with Carbon-60s," in an academic setting, people would say, "Oh, I guess you don't want your tenure anymore" kind of thing. Like, "No, I kind of like dogs. I think I'll take care of them. I'm just going to do this and see what happens."

So thanks for doing that. We're coming up on the end of the interview, but I want to ask you that question, as an adult who experienced biofeedback as a child. If someone came to you tomorrow, Ian, and said, "I want to perform better at everything I do as a human being. What are the three most important pieces of advice you have for me?" What would you offer them?

Ian: The first would be passion. Do whatever you feel passionate about. It will probably change over your lifetime. But I think that's the only way to really do the things that you want to do with the zest that's required to do them, is you have to be fueled.

I mean, if you're doing something that you stay, in my case, at the lab until 1:00 a.m. or 2:00 a.m., and then you're back there the next morning, and you're excited about it, and you push, you'll make a dent. If we're intending to make a dent in the universe, which I am, that's what you need, is you have to have enough passion. Because when everybody else is gone, and you're fatigued, it will keep you moving. Luckily, all of the people that I work with are that way. They're very passionate, and we're all really driven. So that's one. Passion.

The second thing, I would say, is to find some sort of calming effect, whether it's biofeedback or meditation ... something that taps you in. Something that gives your brain a bit of respite, so you can relax, center yourself, see where you need to move, and then come back refreshed enough that you can actually do that and bring it.

Because I don't think without ever having a chance to rest you can really fully come back and bring the kind of energy that you need to bring into the world. The world lately seems a bit devoid of love, and I think if you really find a place where you get silence, you come back and your heart's in the right spot, and your mind's in the right spot.

Then ... three things. The last, but not least, and this is an oldie but a goodie, and it sounds kind of trite, but it would ... "be the change that you want to see in the world." It's been said, obviously, quite a bit, but ... It sounds contrite, but it's really not, because if you want to do the things to make the world the way you want to see it, it's difficult.

You have to be brave and compassionate, and you have to push. You really have to work diligently to be the person that you want to be, to make sure that my kids walk into a planet that is better than I found it. So those would be the three.

Dave: Ian, thanks for being on Bulletproof Radio. I'm guessing-

Ian: My pleasure.

Dave: I'm guessing livepetllc.com.

Ian: That would be one, and then carbon60plus.com.

Dave: Okay. Carbon60plus.com. You said that I'm soon going to have access to some human-grade stuff.

Ian: Yes, yes you will.

Dave: Which of those URLs has that when it's going to come out.

Ian: Carbon60plus.com.

Dave: Carbon60plus.com. All right. Well, I'm hoping you send me a bucket of that stuff.

Ian: I will.

Dave: All right. Thank you.

Ian: Happily. Yeah, and thanks for everything you're doing. I mean, you're really moving the needle. It's been quite the pleasure getting to know you because of that.

Dave: Aw, thanks Ian. We will talk soon. We'll hang out in Austin next time I'm in town.

Ian: Sounds great. Thanks, Dave.

Dave: If you liked today's episode, you know what to do. Try some Carbon-60 and see if it makes you levitate. All right. IT probably won't do that. But I think there's some merit to the stuff. You might like it. Or give it to your dog first, and see what happens. Or your cat, or ... not your goldfish. I don't think it works on them. Have an awesome day.