Announcer: Bulletproof Radio, a state of high performance.

Dave: You are listening to Bulletproof Radio with Dave Asprey. Today's cool fact of the day is that slime mold has found a way to feed this next generation. That's because researchers have discovered that social amoebas secrete protein that help preserve what you could call a starter kit for its offspring. This is a kind of slime mold from soil called, I'm going to try this, dictyostelium discoideum and it eats bacteria. Some wild forms of that species basically farm the bacteria and pass them along in spore cases that give the next generation of amoebas the beginnings of a local patch of prey. Tests found that the trick to keeping the parental immune system from killing the starter crop of bacteria is a surge of proteins called lectins. Lectins create a different way for those amoebas to treat bacteria as actual symbiotic inside the cells instead of as prey or as an infection according to molecular cell biologists at the Baylor College of Medicine in Houston.

Dave: Now the reason this is interesting is that lectins are a protein you may have heard of. You've heard about them Bulletproof Diet and you've heard about them in the Plant Paradox from a recent interview with Dr. Steven Gundry. Lectins are signaling molecules that turns out have all sorts of interesting effects throughout the body and throughout all of Mother Nature. This is a new and interesting use of them. These findings, just as a general biology thing, marked another chapter in a story that's been upending decades of what we thought we knew about amoebas and bacteria. This basic almost alien scenario is still true, that these kind of amoebas that they like to call dictys, start life as single cells, but when food dwindles they come together into bigger, multi-cellar slug shaped creature with 8 to 10 kinds of cells and the ability to crawl. It develops into something more like a fungus with a stock holding up a case of spores to start the next generation of amoebas. Now if that doesn't sound an awful like that one uncle you don't like, well think about that.

Dave: Now, I think I did a terrible job in my perpetual quest to be great at foreshadowing, because I actually dropped a name, Dr. Steven Gundry. He is on Bulletproof Radio again today, but he is not here to talk about lectins, which was the topic of his last book. He's here to talk about something new and amazing.

Dave: Dr. Gundry is a renowned heart surgeon, including a lot of background in robotic surgery as an early pioneer in that, a celebrity doctor, four times the New York Times bestselling author, medical researcher, and just an amazing, intriguing human being. He just wrote about a topic that you know is near and dear to me, which is antiaging and longevity. His new book "The Longevity Paradox: How to Die Young at a Ripe Old Age" just came out. He talks about stuff that isn't lectins. He talks about gut health, a whole new side of research for him and you're going to dearly love this interview. I know that because I've already had a chance before this interview to sit down and talk through in detail what Dr. Gundry has done. Also, of course, I read the pre-release version of his book. Dr. Gundry, welcome to the show.

Steven: Dave, pleased to be back again and chat with you some more.

Dave: All right, I'm scrolling through the list of qualifications for you that I have in my preparation notes and it's hard to pick which ones. You hear a show like this and you think oh there's these people who come on and it can sound like bragging if you were to list all of your stuff there. But you look at your pioneering work in Zeno transplantation, this idea that how are we going to take and organ from one species and put it in another species like humans. Okay, that's kind of cool. You're one of the original 20 investigators of the first implantable left ventricular assist device and you've created multiple techniques for cardiac surgery. You're called the Father of Robotic surgery. Let's see, you're a pioneer in infant and pediatric heart transplants, and you've done more of those than anyone else in the world, so you're basically a super medical badass.

Steven: I'm a medical Renaissance man somebody recently told me. That's a high praise, I'll take it.

Dave: You were also, for two terms, President of the Board of Directors at the American Heart Association's Desert Division which is-

Steven: True.

Dave: ... really interesting because when you talk about the health of say your arteries and things like that, oftentimes you start talking about diet a lot more than we used to. It seems like you don't have as much of a mainstream view as I would expect for someone who's been a cardiac surgeon.

Dave: Before we get into this longevity thing, I'm just going to assume that not dying of a heart attack is an important part of longevity?

Steven: Yeah, statistically most of us will leave here with either your heart stopping or cancer eating you up, statistically.

Dave: Yep.

Steven: Heart disease is right up there on the things we ought to be worried about.

Dave: Why is longevity a paradox, Dr. Gundry? Because it seems like not dying, like you said, heart attacks, cancer, maybe a little bit of diabetes and Alzheimer's thrown in there, but the than that, where's the paradox?

Steven: Well I think the paradox is most of us, including you, Dave, want to get old, live a long time, but when we look at what that means, at least in our current generation, it doesn't look very good. It looks like having knee replacements, hip replacements, having stints, maybe having a cancer or two cut out or zapped. For a lot of people it looks like sitting in an assisted living or a nursing home and not remembering your family's names, and that doesn't look very good. The paradox is yeah we all want to keep going, but how it looks keeping going doesn't look very good. The whole book is, okay, it doesn't have to be that way.

Dave: If it doesn't have to be that way, why not?

Steven: Simplistically, it turns out that we age because Hypocrites was right 2,500 years ago that all disease begins in the gut. I've added to his belief that not only does all disease begin in the gut, but all disease can end in the gut. Interestingly enough, from little tiny creatures you were talking about amoebas, well there's a wonderful little worm that all of us know in longevity research called C. elegans. C.elegans, everything that C.elegans has predicted in this little, tiny small creature, it happened longevity has been confirmed in every animal study including Rhesus monkeys and at least if you ask David Sinclair at Harvard he'll tell you that it happens in humans.

Steven: C. elegans, this model shows that even in this little, tiny worm it has bacteria in its primitive gut and those bacteria interact with the single cell surface of its gut, just like we have a single cell surface of our gut. As the bacteria slowly or rapidly break down that wall, literally I call them hordes at the gate, as that wall breaks down that initiates the process of aging. The stronger that wall is, the less broken down it is, the less aging occurred because aging, at its core, is inflammation. I, and others, believe that inflammation is from leaky gut, period.

Dave: All right, now that is a really big statement. Long-time listeners and fans, anyone who's read the "The Plant Paradox" or anyone who's read "The Bulletproof Diet" knows that leaky gut matters. In fact, there's been so many people on this show that I think in terms of functional medicine, and even some of traditional Western medicine, we've all come to the conclusion that there's probably something like a leaky gut and there's enough real science with the gap junctions in the gut that we can say, "All right, we're going to agree as medical people." However, I've also heard a lot of people say that there are other causes besides lipopolysaccharides leaking through the leaky gut. That's probably the most extreme statement that I think I've heard you make, that it's only caused by that. What about air pollution? Is it that air pollution causes leaky gut which then causes LVS?

Steven: Actually, I was just thinking about that last night because people know, maybe they don't know, I was a professor at Loma Linda University for most of my career. Loma Linda is the only blue zone in America. It's the only American blue zone that exists. When I moved to Loma Linda in the mid to late 80s, Loma Linda had so much smog that my long-time colleague and friend, Leonard Bailey, who recruited me there, said, "I don't like to breath air that I can't see. I don't trust it." Loma Linda is surrounded by 10,000 foot mountains and half of the year, in those days, you could not see those mountains because of the smog. Yet, these are the longest living humans in America. Now, the smog is clearly much better as any of us who live in Southern California, still. But, these people were doing this despite the smog.

Steven: I'm always impressed with the data from the Kitavans, those interesting chain-smoking New Guinea residents who smoke like fiends and yet they live well into their mid-90s with no medical care. They have no evidence of heart disease, no strokes, no cancer, and yet, they smoke like fiends. I think if we have a good system, and you and I have talked about this, if we have a good system, and I hate the word detoxification, I just hate it.

Dave: I know, it has so many connotations, but I don't know a better one.

Steven: I know. It's just an awful word. We can deal with these environmental stressors.

Dave: Your point is that we're wired to deal with whatever Mother Nature throws at us as long as our gut bacteria works.

Steven: Yeah. Now-

Dave: I like that perspective, okay.

Steven: [crosstalk 00:12:15].

Dave: Like 5G, I've seen plenty of evidence that certain kinds of EMFs in certain amounts, et cetera, are not good for us biologically simply because I have a 50,000 pulse electromagnetic frequency device that changes bone tendency, so I know my body responds to EMFs. That is factual. I look at that I say, all right, I know there are things outside the realm of my gut bacteria, but I also believes they're probably affected by that stuff as well. If that isn't something that Mother Nature throws at you ... are there forces that man is unleashing that affect longevity that your gut bacteria are just not equipped to handle?

Steven: Yeah Roundup.

Dave: Oh there you go, okay, because that kills your gut bacteria.

Steven: Yeah.

Dave: Thank goodness the great people who brought us Roundup determined it was safe for humans because it only affects bacteria and we're not bacteria. Sorry, I tried not to laugh when I said it.

Steven: Glyphosate was patented as an antibiotic. It wasn't patented as an herbicide. It was patented as an antibiotic, so these wonderful people knew that it did this. They knew bacteria use the [inaudible 00:13:35] pathway. But don't worry, it just kills bacteria. Everybody wants to kill bacteria.

Dave: It's a very weird dynamic. Have you seen the research, it just came out, and if you haven't we don't have to go there, but they found enormous numbers of extremophile bacteria, something like a mile deep. They're now hypothesizing that much of the crust of the Earth is essentially full of little, tiny lifeforms and bacteria that they didn't think about. When they took that into account that the total massive bacteria on the planet is way bigger than they thought it was. Did you come across that research?

Steven: Yeah. I even mentioned that in the "Longevity Paradox" that-

Dave: Oh, I didn't see that. Okay, that's cool.

Steven: Not that particular thing.

Dave: Oh.

Steven: But the original lifeforms were living on hydrogen sulfide-

Dave: Yes.

Steven: ... and I think I make some wild statements that our mitochondria might be quite unique, along with naked mole-rats, that our mitochondria, being ancient bacteria, actually can do very well using hydrogen sulfide as an energy source. I also make the rather unique statement, which is true, that humans and naked mole-rats, and naked mole-rats are the longest living rats.

Dave: My spirit animal, right.

Steven: Yeah, yeah. Just as an aside, when I was a professor at Loma Linda I had this huge technicolor purple/pink of a naked mole-rat sitting behind my desk-

Dave: That's awesome.

Steven: ... from the San Diego Zoo. People would come in, grand professor of heart surgery, and there's a giant naked mole rat behind me.

Steven: Anyhow, humans and naked mole-rats have the lowest levels of hydrogen sulfide dissolved in our blood. My preposition is that's because we actively extract it like naked mole-rats. I want you to ponder that Dave.

Dave: You're probably one of the few people who would have thought through all these different pathway things. Here's a question for you, we know hydrogen sulfide tends to be toxic, right? It gives you a-

Steven: Correct.

Dave: ... headache if you remember college chemistry lab if you were in there. Well I have relatively strong mitochondria now in that I feed them very well, I take care of them, and I've written books about that. It's probably because maybe I don't have strong mitochondria genetically, or I have weird ones, maybe because of the 15 years of antibiotics that I took or something. But I have this thing that's repeatable, every time it happens I get the same affects.

Dave: I go to a local beach here on Vancouver Island where there's a ton of seaweed that washes up. It smells like rotten eggs, it's full of hydrogen sulfide. I feel like crap for two days, really bad. I have to get in my hyperbaric oxygen to turn my brain back on, otherwise I'm just walking through mud all the time. I used to think it was just me because I was nuts. I found some studies from France where they actually found deer that were dying from the air near seaweed that was making that stinky smell because of

hydrogen sulfide. It has the effect on mitochondria just like cyanide in that it suppresses mitochondrial respiration. However, my kids and my wife were playing there and they say it smells like eggs, it's no problem. Why is this knocking me out Dr. Gundry?

Steven: Dave, Dave, Dave, we just got to get your mitochondria in better shape. Maybe we need to have your gut microbiome talk to your mitochondria better. As you know, they are, as I talk about the sisterhood, I think we can go down so many wild rabbit holes that, we inherited our gut microbiome from our mother, and mitochondrial DNA are inherited from the mother. I think that's not by accident. These engulf bacteria which would become our mitochondria. I, and others believe, and there's now evidence that talk to each other and tell each other how things are going in their respective worlds. I think we've been incredibly naïve about the interplay between that world and our world.

Steven: As I talk about in the "Longevity Paradox", we have, I think, uploaded most of our information processing to our bacterial cloud that lives in us, on us, around us, because they have far more genes than we do. They reproduce virtually instantaneously, and so they can do fantastic information processing. Many of us think that perhaps lifeforms on Earth, particularly animal lifeforms, exist as a home for bacteria to prosper on Earth. That's really do-do-do-do-do-do-do-do.

Dave: Yeah.

Steven: But, we'll find out.

Dave: I am 100,000% convinced that from my mitochondria's perspective I'm this neat walking Petri dish and that they're in charge before I'm in charge. I get the dregs and that's the whole genesis of my "Head Strong" book, as a computational computer science guy who studied distributed systems, emergent behavior. Our ego is an emergent behavior of bacterial operating systems, which is number one, don't die right now. Number two, don't starve. Number three, have a lot of sex. Yeah, that's pretty much every bad decision I've ever made with respect to dating, eating, and procrastination came from my mitochondria, not from me, so it's their fault. When you realize they're also both managing the gut bacteria, so maybe like that slime mold, they have a little pouch of bacteria they hold, we're kind of like a big slime mold. But maybe it's the other way around. Bacteria in our gut are managing our mitochondria and really it's symbiosis, right? It's-

Steven: Right, right.

Dave: ... yin and yang.

Steven: Yep.

Dave: Well what I want to understand, I love that you think that way. You and I, every time we've had a chance to sit down, which is now more times than I can easily remember, I'm always happy about it just because it makes me think. But there aren't a lot of people with your, I'm going to call it pedigree, just your incredible string of success using

robots to do surgery. The president of the American Heart Association, you're supposed to have horns and be one of those, "If you don't take antibiotics every two days you're a bad person." Trust me, I'm wearing a white lab coat and I have a stethoscope. What the heck made you such a rebel? How do you keep one foot in that world with the respect of your colleagues and another foot saying, oh my God, the bacteria are in charge? How do you coexist?

Steven: I just keep quoting George Patton, "If everybody's thinking alike then somebody isn't thinking."

Dave: That is a damn good quote. I did not know that was George Patton.

Steven: That's George Patton, yeah. Carl Sagan said science only moves forward by defined conventional wisdom. You look at what was once heresy, like Lister's Theory of Antisepsis was heresy, that's ridiculous. Obviously, you don't need to kill bacteria. Bacteria have nothing to do with an infection. The guy was ridiculed, basically almost drove him insane. You look at all these heretics that eventually were right.

Steven: The purpose of science is to disprove your hypothesis. You set up an experiment to prove yourself wrong and only if you cannot prove yourself wrong does it make it right. For instance, I invented a way of protecting the heart during heart surgery by pumping preservatives backwards in the coronary venus system, the coronary sinus, because there weren't any blockages in the veins of the heart. If you're operating because of blockages you couldn't get past blockages to protect the heart. It became very popular, it's still very popular. But when I first presented my human data at the American Association of Thoracic Surgery, Dr. Denton Cooley, one of the great fathers of heart surgery who I got to know very well, stood up afterwards and he says, "Young Dr. Gundry here is trying to tell us that you should give the heart an enema and the enema is going to come out of the lesbian veins, they're actually called Thebesian veins, but those were the days that you could say those things. In front of 5,000 eminent surgeons he's saying, "Dr. Gundry is giving the heart an enema and it's coming out the lesbian veins."

Dave: That's so wrong.

Steven: Of course, now it's the widest used device to protect the heart in surgery. Sometimes you just got to say there's got to be a better way. There's always a better way, always a better way.

Dave: Well I appreciate your mindset on that and I love that you've got your lens turned on aging. It's awesome that in The Longevity Paradox you start out with that idea that it's our bacteria, not our genes, that made us human. Man, you nailed that. That's what's happening. We wouldn't be humans, we'd be slime molds or something because we wouldn't move around and make power without having roots in the soil, and that would suck.

Dave: Then you get into building seven deadly myths of aging, which I think our listeners would love to know something about. I found that it was very hard to put down your book because you really tell it in a good way, but walk through the Mediterranean Diet myth, tell me about that one. That made me happy, by the way.

Steven: It is true that two of the blue zones are in the Mediterranean, Crete and Sardinia. A third one that I name that I think most everyone accepts as a blue zone, the people of Acciaroli, Italy, south of Naples. More people over 100 years of age in that town than anywhere in that world. 30% of the population is over 100. You look at the Mediterranean Diet and you say well, that's clearly a longevity diet. What's in the Mediterranean Diet? Well the Mediterranean Diet does have grains, does have beans, and as I show in the book, there are actually some convincing studies that cereal grains and beans are a negative part of the Mediterranean diet that is-

Dave: Amen brother.

Steven: ... healthy.

Dave: Oh sorry, I just had to say that. [crosstalk 00:25:41].

Steven: They don't like you. It's countered by the positive effects of the Mediterranean Diet and that is fruits and vegetables, seafood and lots of olive oil and red wine. Interestingly enough, the Acciarolis do not eat bread, do not eat pasta, do not eat cereal grains, actually because they say they can't afford them, I've interviewed them. But they do eat lentils that have been soaked for days and days, and days, the water changed, and then cooked for quite a long time. Even in Tuscany they cook their beans, they soak them for days and then they cook them in pots for days. I think this teaching of how to detox by lentils and other pulses has been lost.

Steven: Anyhow, I think one of the smartest researches the Cleveland Clinic ever did ... As you know, the Cleveland Clinic invented a test that identifies this interesting protein called TAMO-

Dave: Yes.

Steven: ... that is a pretty interesting, and at least from their standpoint, nasty thing that hurts blood vessels, let's just leave it at that. TAMO is, among other things, made by our gut bacteria from certain animal proteins, particularly carnitine and choline. Interestingly enough, fish has preformed TAMO. If TAMO was all that bad for you then why is it that several of the blue zones are fish eaters? Fish, in every study done in epidemiology, always wins over red meat in terms of longevity.

Steven: TAMO, we could debate TAMO all day, but, to the Cleveland Clinic's credit they said, "The folks in the Mediterranean ate fish, they ate salami, they ate prosciutto, they don't have much heart disease. What gives? They found a little chemical in olive oil, balsamic vinegar, and red wine, 3,3-1 dimethyl butanol, paralyzes gut bacteria enzymes so they cannot make TAMO out of choline and carnitine. Low and behold, that may be the key

of the Mediterranean Diet is lots of olive oil, red wine, in moderation, and balsamic vinegar, so have some.

Dave: Interesting. I've written several pieces about TAMO on the blog, going back quite a bit because it's one of the things that radical vegans used to try and say you should never eat an animal protein again. However, it's interesting, I've quantified my gut bacteria with the Viome Test and I'm an advisor to Viome, and investor in the company, and have talked to the chief scientist and I've run other company's tests. My gut bacteria don't make TAMO when I eat meat and that's probably because I don't eat industrial meat and because I have a gut bacteria set that works pretty well, so how is that? Maybe the other thing is heck, for all we know, eating lentils causes the bacteria that make TAMO to form. I don't think we know all of the pathways there yet. So-

Steven: No, in fact, I've got two vegans, lifelong vegans, who are in their mid-70s that we've been doing the TAMO test on them, gosh, I don't know, since it was invented maybe four years ago. These guys, just this won't mean anything, TAMO should be less than six, according to the Cleveland Clinic. Their TAMO is at 175, just ridiculously high number. We've talked to the Cleveland Clinic, they go, "That's impossible. It can't be. They're vegans." Yet, every time we test them they're up like this. You're right, I think there's a whole lot of things we don't understand about TAMO yet.

Dave: Cool. Well I love that you talk about that, but you're basically saying the myth of the Mediterranean Diet is whole grains and beans, and all that sort of stuff, and that's not what makes the Mediterranean Diet healthy.

Steven: Right.

Dave: That those are things that are working against the Mediterranean Diet even though the combination of sunshine and clean air, and community, and olives, and all of the other stuff that they do that [crosstalk 00:30:31] it works out well. This is a really important point in that we all do things that are good for us and we do things that are bad for us. If you could do less of the bad and more of the good, it's amazing what happens. But doing less of the bad is step one in all of my work. It's like could we just not be wasteful. If every morning you wake up and after you brush your teeth you smack yourself in the face three times, and you say, "Well I have a pretty good day after that," you could still wake up, brush your teeth, and not smack yourself in the face three times and have a better day, even though you were doing pretty good. It's that mindset like it's okay to not do that stuff even if we thought it worked. I feel like you're just all over that. What's another one? Tell me about growth hormones and youthfulness.

Steven: As we've talked about before, your job is to grow up, mate, have a baby or two, and make sure they're okay, and then get out of the way so that your kids have something to eat. Early on, growth hormone is a really, really good thing. But as we get older, there is nothing in us that we want to grow. I'm convinced, along with David Sinclair, that making sure we don't stimulate mTOR or TOR with appropriate energy sources that will stimulate it as we get older is a pretty smart thing to do. We could debate that, I suppose, all day long, but my research in my patients and looking at the data says that if you have a low insulin-like growth factor IGF-1, as you age, that promotes good aging. In

fact, I can't think of an exception. I study a lot of people, super agers above 95, early 100s, these people all run IGF-1s of 70 to 80. This correlates with good aging. On the other hand, a high AGF-1 as you age, above 200, correlates extremely well with developing cancer. Because you think about it, insulin-like growth factor, growth factor, and why would you want to stimulate things to grow as you get older. Like I say, most of us are going to leave with heart disease and/or cancer.

Dave: Don't you want growth to maybe make that endothelium, the lining of your cells ... Don't you want youthful recovery which equals growth of all the issues in your body as you age so that you can maintain youthfulness?

Steven: There's pretty good data showing that VEGF is a pretty nasty compound in terms of increasing the thickness of your blood vessels and certainly stimulate blood vessel growth towards cancer cells. Plus, this cute little sugar molecule in beef, lamb, and pork, which is neu5Gc, that cancer cells use it to stimulate VEGF. Now, VEGF is not a good thing as you age.

Dave: What if you have extremely low VEGF, what happens?

Steven: It depends on how old you are. Like I say, you're designed to grow, we're a slow growing creature, which I get into one of the other myths about milk does a body good, milk from bovines or other ungulates, has huge amounts of growth factor because these cows, these sheep, cows, goats, are supposed to grow quickly to avoid predation. You want a lot of growth factor in milk. On the other hand, humans are slow growing and we don't want to grow quickly. The last thing I suggest for people's health, particularly your kid's health, is don't give them milk from some other species, because it contains growth hormones appropriate for a rapidly growing species, and that's not us.

Dave: What about say milk fat versus milk with all of its proteins intact?

Steven: The good news about milk fat is it doesn't have growth [crosstalk 00:35:05].

Dave: That's why butter versus milk, people.

Steven: Yeah [crosstalk 00:35:10].

Dave: ... anyway.

Steven: Just as an aside, as you may or may not know, I'm supposedly one of the world experts on the dietary treatment of the APOE e4gene, this carrier, the "Alzheimer's gene". About 30% of people carry this gene. Saturated fats, particularly animal saturated fats, in my studies, in the Albrechtsen studies, clearly increase small dense LDLs. Now, we could argue whether those guys are bad or good for us, and whether it really matters, but I think the APOE e4 lipo protein transport system does not move cholesterol in and out of brain cells properly. I think if it was me, that would not be high on my list of things to have in my diet. Can you have some? Yes, you can, of course. But that would not be high on my list.

Dave: Now what percentage of people have this APOE gene, somewhere around 10% of people have double mutation on that?

Steven: The double mutation, 4-4, is only about 1-2% of the population, but about 25-28% of the population has the single mutation, 3-4, so that's a lot of people.

Dave: You're saying about 25% of people would want to limit the amount of saturated fat that they have?

Steven: Correct.

Dave: That matches. In fact, one of the older posts that I've written I talk about here's what to do if your blood lipids go up or down on a particular diet, whether or not you know your APOE 3 and 4 status. I'm a 3 and 4, but I look at my triglycerides, I look at my HDL, I look at cholesterol, I look at particle size. I don't have particular high SD. I don't even know if you want to call it the "bad" type of LDL, because it used to be LDL itself was bad, but we'll say that there's questions about it.

Steven: Correct.

Dave: I look at all that and I say, all right, if someone's doing stuff right, the first thing you do is say so I have a methylation problem, if my inflammation is still up, which is a different pathway. Then-

Steven: Correct.

Dave: I do have that problem. Then you say, all right, do I need to take the methylated folic acid, and B-12, and P5P form of Vitamin B6. I found somewhere around 10% of people who say, "All right, I went on the Bulletproof diet, I follow this lifestyle and I still have high inflammatory markers. I lost weight, my brain turned back on, but I don't like my numbers." Then what do you do? For some people, they stick around for six months doing this kind of eating and then the high LDL drops. The theory there is because they dumped all the fat from their liver and it took a while for them to drop their liver fat. If it doesn't normalize then let's look at what's going on there. Then the recommendation in that post was, hey, maybe you should have some more olive oil. It's okay to dial back.

Dave: The cool thing about Bulletproof Coffee is you could put a lot of butter in there, like I did when I started, because I was starving for the stuff. I get to the point where it's like give me a tablespoon or so, that's enough, and that's what I'm having in the morning. Sometimes if it's going to be a really big day and that's all I'm having, or whatever, I might do two, but I put the brain octane, which is saturated, but it's not that way. The point here is permission to experiment based on your own data because if 25% of you should be having less saturated fat that's okay and you shouldn't be out there bathing in butter or bacon, but whether you should be eating none of it ever is another question entirely. That's my next question for you.

Steven: Actually, I'm going to add MCT, medium-chain triglycerides, do not get absorbed via chylomichrons.

Dave: Exactly.

Steven: I even tell my APOE e4s that you can have your MCT oil, but I would stay away from the other long-chain saturated fats that are present in coconut oil. So and-

Dave: This is for that 1% of highly sensitive people.

Steven: Yeah. The other thing, since you brought up LDL, I talk about this in the book, you can put someone into sepsis, you can even use LPSs and non-living bacteria, and they will go into septic shock. Interestingly, their LDL cholesterols, anyone who's septic, their LDL cholesterols go sky high. There is an interesting theory that LDL is there to grab LPSs. People with a high LDL may, in fact, be continually exposing themselves to an LPS burden.

Steven: The other thing-

Dave: Yes.

Steven: ... that I think that so many people miss is prole who are hypothyroid. Even though their numbers may be okay, your LDLs will be high. When you get your thyroid hormones fixed, or you actually get recepting of thyroid hormones, and quite honestly, heavy metals are a really good way of blocking thyroid hormones, actually, lectins are a really good way of blocking [crosstalk 00:40:52] hormone. It's a really good way of doing it you may actually have a thyroid hormone receptor problem as the cause of you LDL and it's not the pound of bacon you're eating every morning, could be.

Dave: I just dearly love that you're dialed in at that level. You're listening to this thing, what was LPS again? LPS is lipopolysaccharides. These are toxins made by gut bacteria that can sneak through a not well functioning gut and cause systemic inflammation. In "Head Strong" you read about how LPS's cause inflammation in the brain, I called it muffin top in the brain, and all that. But something else, and this goes back to the Bulletproof diet, the other thing that will raise LDL is mycotoxins, whether they're from eating grain that has field toxins or storage toxins, or from breathing it in your environment.

Dave: This is a major cause, I did "Moldy Movie". By the way, it's free viewing, moldymovie.com. You can actually see two weird things happen. One is mold itself can drive up LDL because LDL will bind to mold toxins because mold toxins are structurally almost identical to cholesterol, believe it or not. They're very similarly done, they're called lipophilic toxins, they like fat. You get this very interesting thing where if you get mold in your food it opens up the tight junctions in the gut which allows lipopolysaccharide to go through even more defectively. You have this whole system of things that all work together, but end of the day, the research that blew me away was that the people who live very long, what are their LDL levels typically look like in your research?

Steven: The Kitavans are actually pretty interesting. They were extensively evaluated in terms of their LDL levels by Staffan Lindeberg, who is now unfortunately deceased. He compared them to Swedes. They definitely do have lower levels of LDLs.

Dave: These are the smoking, coconut oil and starch eating crazy [crosstalk 00:43:01] people who live in [crosstalk 00:43:01] with good gut bacteria.

Steven: 30% of the diet is coconut oil or coconut. About 60% of their diet is taro root.

Dave: The rest is nicotine, right?

Steven: Yeah, the rest is nicotine. They do tend to run lower. Remember, all of these are theories of heart disease and we have to remember that they are theories. For instance, statin drugs do not work by lowering LDL. They work by blocking toll-like receptors on our immune system. They work by toning down inflammation. We didn't know that they worked like that until the Nobel Prize for medicine was won, identifying toll-like receptors, 2012. But, we thought it was because LDL lowered, but that was actually a side effect of the statin that we could measure. Until we realized that statins worked in a totally different mechanism, most practicing physicians still actually believe that statin drugs work by lowering LDL, they don't. They work by blocking ... They hit the mute button on TLRs, toll-like receptors, and that's how they work.

Dave: Do you know what the very first statin drug was?

Steven: That was actually red yeast rice.

Dave: Before that actually.

Steven: What?

Dave: Nystatin.

Steven: Oh, yeah.

Dave: It's an antifungal. It turns out every one of the statin drugs has antifungal affects.

Steven: That's how they discovered, yeah.

Dave: It's fascinating to me. I was just on the phone yesterday with a lead mycology researcher from Case Western. This guy has the largest collection of fungal spores in his freezer and he works up at the CDC and sends them out to other lab researchers all over the country to look at what antifungals do. He's looking at fungus in the gut. His perspective, which is kind of out there, is that actually there's probably some healthy fungus that lives in the gut. My experience has been pretty much fungus in the gut usually seems like a really bad thing, other than some yeast species, like there's some saccharomyces that probably belongs in the gut. Yeast is different than actual fungus or mold. What is your take as a guy who's really looked at the gut bacteria thing? Do I want to have some

fungus in there or should I just clean that stuff out every now and then with a nice dose of nystatin and oregano oil, and all the other stuff like that?

Steven: No, I think as we're soon going to identify the mycobiome, that process is coming out, we know that the interaction of bacteria and fungi at plant root level is very important. There's obviously a yin and yang, a mix and match. Paul Stamets, author of "Mycelium Running", thinks that fungi are so critically important for plant nutrition that he can't see straight. But, long story short, I think that as we discover this mycobiome that it's going to have the same role in our health that it does in plant health. Just to go do-do-do-do again, we have to realize that the plant root system is in soil and that soil has its own soil microbiome, and that plant is dependent on nutrient absorption because of the bacteria and the fungi in the soil. Our microvilli are our root system and it works exactly like a plant's root system. Our microbiome, our [holobiome 00:47:05], which is the term I prefer, because it can include the fungi and the viruses, our microvilli are embedded in our soil. The reason we're all so screwed up is our soil is also dead just like our soil that our crops are growing in and no wonder we've got such a problem.

Dave: It's funny that you mention the term mycobiome. The guy I was talking about from Case Western is Dr. Mahmoud Ghannoum. He coined the term mycobiome. Since the start of the Bulletproof Blog seven years ago I've been saying, "Hey guys, fungus in the gut really matters." We just have never had the ability to quantify it.

Steven: Correct.

Dave: Now Viome is doing some quantification of that, but I still feel like we're at the very early days of doing it. Your term, which I haven't actually heard before, of [holobiome 00:48:03], it's accurate. There's probably also something with phages and viruses that are in there as well.

Steven: Yeah, absolutely.

Dave: But we also know, flat out, if you eat stuff that's contaminated with glyphosate, or straight up antibiotics they feed cows, it's probably going to affect the soil in your gut, just like it ruins the soil on farms that are dumb enough to still spray that stuff on the soil.

Steven: Correct.

Dave: How religious are you about only eating organic?

Steven: I have an expression "Do what you can do with what you got wherever you are." I can't always make sure that I'm going to eat organic. I become much more adventuresome over in Europe, parts of Asia, than I am here. Although, as you and I both know, glyphosate was approved by the European Union last year, thanks-

Dave: Dumb assess.

Steven: ... to Bayer.

Dave: They're doing the pants suit off of suit off of them right now.

Steven: Yeah, thank goodness.

Dave: I love that. Sorry guys, you lose. You shouldn't have bought them.

Steven: That's right, yeah. I think it's so prevalent. Here's a really sad thing, I was talking with a chef in Santa Barbara who makes pizza using Italian flour. I said, "Wow, that's great, maybe I can get away with this." He said, "Well not so fast." He says, "Italians don't grow enough wheat, so they actually import American wheat and grind it super fine, and then ship it back here." I went, "You're killing me." He says, "Yeah, you're right, I'm killing you."

Dave: Italy is a weird country that way. This fine Italian furniture, a lot of it's made with the worst possible formaldehyde plywood because they lowered their limits so then they could export it back to the U.S. where we like our furniture to smell like death, because formaldehyde is what they use to embalm bodies, that's why it smells like death, also it kind of kills you. It's a strange thing how the industry will manipulate regulations to allow stuff like that to happen. It is true, for me, if I have wheat, which I haven't really had more than once in the last 10 years, which was in Greece, I feel fine. But before that, I did notice I could eat bread in France and generally I felt 10 times better than in the U.S., so we're doing something bad to our soil or to our stuff and it's probably glyphosate, but it could be some other stuff too.

Dave: All right, I know we're getting up on the end of the show. I feel like we could chat for quite a long time. I would love to know what, you talk about in Chapter Seven in your book, "The Longevity Paradox", "Look younger as you age." I know I'm certainly doing that. I look like I may be 14 at this point. Okay, just kidding. Certainly you don't look older than 17. What are the big things that people are going to take away from this?

Steven: I found a picture of me taken in 2008 in June. Then I did the same pose and I took a picture and I put them side-by-side, so 11 years apart. If anything, I look the same. Most people have voted that I actually look younger than I did 11 years ago.

Dave: Wow.

Steven: How you do that, the deal with getting younger is your gut wall is your skin turned inside out. What happens on the surface of your gut is reflected on the surface of your skin, they are the same organ. The reason people get thin skin and it gets tearing, and you just look at your skin at it falls apart, is that's actually a reflection of the lining of your gut and the thickness of your gut. It goes back to my preposition that everything, including your skin, happens at the gut level. Look at my Instagram post and you can vote, but kind of the Joe Willie Namath, I can't wait for tomorrow because I get younger every day, to paraphrase him.

Dave: The things in your chapter that you write about are avoiding BPA, which is really funny. It's really highly present in that flexible credit card receipt paper they use everywhere.

Steven: Yes, yes.

Dave: I've taught my kids, I just tell the people at restaurants and everywhere else they try to hand you that stuff, I'm like, "No thanks." I just don't want the receipt. My kids, they just don't touch it, like oh we don't want that. Why do you need a receipt anyway? You can take a picture if you need it. We could just stop wasting paper on receipts at this point. But more importantly, don't rub it all over your skin, especially if you're using the hand sanitizer, which causes it to absorb 10 times more than before.

Dave: But I love it that you're a cardiologist, a cardiac surgeon and you're saying this BPA stuff matters, let's get it out of our things. What else? What is azodicarbonamide?

Steven: Well that's your yoga mat, and it's in almost all of our breads and almost all of our crackers. The other thing people should realize is that most gluten-free foods are raised with trans glutaminase, which is actually the real culprit of gluten. It does not have to be listed on a label, and-

Dave: In other words, most of the grains, so don't eat grains. It's not that you shouldn't eat gluten, it's just grains themselves.

Steven: Yeah, they're plant babies and boy plants have figured this out. They're a whole lot smarter then we want to give them credit for, they've had a lot of practice, far more than we have.

Dave: They have indeed. I love it, you and I are in such agreement there. I went gluten free many years ago and realized it was more than gluten. I had the mix of random grains with some garbanzo beans thrown in for extra lectins. You wonder why you look like crap the next day. It wasn't worth it for the pancake, it just wasn't. It didn't even taste that good.

Steven: That's true. It's interesting, I now do a lot of deeper dive into leaky gut tests and food sensitivities. I can tell you about 90% of people who do react to gluten cross react to corn and it's fascinating. So many people of these people, and so much corn is in gluten free, and so much corn is in everything. But about 90% it's corn that's equally the culprit, so they're eating gluten free and they still got leaky gut. They're going I guess I'm not sensitive to gluten and it's often corn.

Dave: That's one of the big things, when you say I'm going to try eliminating this one thing that I think is making me weak. Look, if you're eating five things that knock you on your butt and you eliminate one you will feel no difference. You got to get rid of all of the suspect things. It's just important. Only do it for a couple weeks and you'll just see the huge explosion of wellness in your body and they say, "Oh maybe something I was doing," and maybe it's only four of the five things, and you can add them back in one at a time.

But the idea that you're going to remove them one at a time it's just bad science. That's not a good research methodology.

Steven: Right. The first principle of my book is it's what I tell you not to eat that's far more important than what I tell you to eat.

Dave: Yeah, I love that, and your longevity parasite.

Steven: Maybe there is a longevity parasite.

Dave: I love that I just said that. I didn't even know where that came from. In your longevity parasite book ... By the way, if I had to predict what that was I would call it rat tapeworm eggs, which I took for several years as a way of modulating inflammation in my gut. Mark Hyman and I talked about that on the show, so maybe that's the one.

Dave: In "The Longevity Paradox" you talk about lifestyle plans, you talk about blue light, you talk about the types of foods to eat, and some other things that we didn't get into in this interview.

Steven: We'll come back.

Dave: It's a comprehensive book. I just have to say, your level of credibility, it's got to be hard for someone to be, "Oh yeah, that Gundry guy, he doesn't know what he's talking about," because you sort of have proven your confidence in multiple fields at the highest possible levels. That makes you a game changer on multiple fronts. Have you received a lot of criticism for this?

Steven: Not so much for "The Longevity Paradox". I certainly have my radical vegan critics for "The Plant Paradox", the-

Dave: That's a sign of success though. If they're not yelling at you, you're not making noise.

Steven: Yeah, that's exactly right. I'm a challenge to their balance and so be it, that's okay.

Dave: Yeah, it is okay.

Dave: I have to tell you, lectins matter so much. They're one of the five big Mother Nature toxins. Mother Nature would never harm me, like you ever seen a wasp paralyze a spider and then insert eggs inside the paralyzed spider to hatch an alien like in the movie? Yeah, Mother Nature will harm you, unquestionably about that. The idea that plants might make something to keep us from eating them, it's not that hard if you're a system's thinker to think, "Well if I was a plant what would I want to do if I couldn't run away," so thank you for helping to popularize that concept, because it is real. It is known. The science is so solid and anyone who says, "That can't be the case," they're just hysteric. But what you're talking about there, it's legit, it's real.

Dave: What you're talking about in "The Longevity Paradox", you have some theories in there that you identify as theories, ones that I find to be intriguing, and ones that I mostly agree with. Essentially, thanks for putting it out there and continuing to push the boundaries Steven. You're doing amazing work.

Steven: Appreciate it. You're going to get 180 and then I've limited myself to 150, so-

Dave: That was my next question for you. Your number is 150.

Steven: Yeah. We have a saying in our clinic that 150 is the new 100. I actually firmly believe that.

Dave: Are you going to be embarrassed if you die before 150?

Steven: Well I talk about people who write longevity books, in general, don't live very long.

Dave: They don't feel embarrassed either because if they die early they're dead.

Steven: Yeah. I write that my critics will be waiting for me to kiss off very shortly and prove myself wrong. But Jack LaLanne, who I got to know [inaudible 00:59:06], the godfather of fitness and nutrition really, he used to say, "I can't die, it's bad for business." So there you go.

Dave: I love it. Both of us are willing to die trying, even though trying's a weasel word there, to live as long as we can and feel good. I think you're on a great path of that and you're helping a lot of people.

Steven: Thank you.

Dave: Your new book, "The Longevity Paradox", and your website is doctorgundry.com. Thanks for being on the show.

Steven: All right, thanks a lot Dave and we'll see you soon I'm sure.

Dave: Count on it.

Dave: If you liked today's episode, you know what to do, pick up a copy of "Longevity Paradox", you are going to love it. While you're at it, may I suggest you pick up a copy of my newest book "Super Human"? You'll have to pre-order it, but if you to buy Dr. Gundry's book and pre-order "Super Human", Amazon will do you the favor of telling other people that those are two worthy anti-aging books. Have a beautiful day.