

Speaker 1: Bulletproof Radio, a state of high performance.

Dave Asprey: You're going to love today's show because I'm talking with a couple guys from the UK who have really focused in on the difference between antioxidants and polyphenols, or plant compounds. You're going to learn a lot of interesting things about the foods you can eat that make a difference for how your cells function and maybe why high dose antioxidants are not a good choice for you. So listen through all the way to the end and you'll pick up a bunch of different pieces of advice for how you can perform better and feel better. This show is totally worth your time.

You're listening to Bulletproof Radio with Dave Asprey. Today's cool fact of the day is that we've just discovered a new way to make old cells behave like young cells. University of Exeter researchers found a way to rejuvenate those old cells, at least in a lab, which made them look younger and behave like they were younger cells. Within hours of this treatment, the older cells divided, they had longer telomeres, which are the caps on chromosomes that shorten as you age. One of the ways that we're looking to extend human life is by fixing that telomere problem.

The researchers were using compounds called Resveratrol analogs. That's a substance based in or found in red wine, although in very small amounts, dark chocolate, red grapes, blueberries, and they added the stuff to the cells. Within hours, rejuvenation happened, which is kind of cool, and they said this demonstrates that when you treat old cells with molecules that restore levels of splicing factors, the cells regain some features of use.

Resveratrol's been in use for a very long time in the fields of functional medicine and anti-aging, and there's trans resveratrol and some other compounds and things like that that come from grapes that are in Polyphenomenal, the polyphenol blend that we just came out with. But the idea is that when you use these small [inaudible 00:02:02] molecules, your cells can do some things that they probably were always designed to do if you were eating enough vegetables, which is kind of a cool thing. I expect to see a lot more research about how these types of compounds affect our cell biology over the next 10 or so years.

Before we get into today's show, you probably already know about Brain Octane, which is oil that raises ketone levels in your body, which gives you a ton of energy and fuels your brain with fat instead of sugar. In fact, the fact we have backup source to blood sugar. What you probably don't know though is that we have a three ounce bottle that's TSA legal. You can take with you, you can refill and we also have packets. So you can get a box of little single serving packets where you just tear off the top and dump it on your salad, pour it in your coffee

when you're on the road. I use this stuff when I travel, and so every meal I have some Brain Octane, which completely removes my cravings and gives me an extra source of energy. So if you didn't know you can take it with you, now you can. That's Bulletproof Brain Octane on Bulletproof.com.

If you'd like to watch a video of this show, go to [Bulletproof.com/YouTube](https://bulletproof.com/YouTube) and you can check out pretty much the whole catalog here. If you'd like to leave a review, go to [Bulletproof.com/iTunes](https://bulletproof.com/iTunes). It will take you right to the show so you can subscribe or you can say how cool it was because this is going to be a cool show.

Today's guests are Aidan Goggins and Glen Matten. This is two authors who write about some similar topics. Aidan wrote "The Sirtfood Diet", and Glenn wrote "The Health Delusion". They're really influential parts of the international health and food discussion happening right now out of the UK. Aidan is a pharmacist with a Masters Degree in Nutritional Medicine and Glenn has a Masters Degree in Nutritional Medicine, so these guys have spent a long time studying this stuff.

They work in fitness, sports nutrition and have worked with professional and Olympic athletes, and Aidan is officially ranked as one of the most influential people in the UK food industry. So these guys have written a lot of cool stuff that I've enjoyed, and I wanted to pick their brains today. So guys, welcome to the show.

Aidan Goggins: Hi David.

Glen Matten: Pleasure to be here.

Dave Asprey: All right. So Aidan, say something so everyone knows your voice.

Aidan Goggins: Hi David. Great to be here. I'm looking forward to talking about more [inaudible 00:04:17] cells survival pathways.

Dave Asprey: All right, we can do that. And Glen, say something.

Glen Matten: It's a delight to be chatting to you. I thought your preface with your fact of the day was the perfect intro to what us guys want to talk about.

Dave Asprey: It might have been planned in advance. A full admission there. The idea here is that you guys have really focused on some things like the sirtfood diet. Very few people talk about sirt foods. In fact, let's just get into that. What is sirt?

Glen Matten: Sirt is short for sirtuin, which refers to a family of genes that we all have. There are seven sirtuins within that family. It's an incredibly powerful activator within our cells of a whole bunch of really beneficial, health promoting changes. All of the stuff you were talking about in your preface, we know that if we get the

right polyphenols, these plant compounds, into our diet they can actually begin to speak to our cells and activate this incredibly powerful family of genes, which are being heavily researched for their longevity and disease prevention benefits.

Dave Asprey: Glen, that's a fantastic way of describing it. You sort of got into this because you describe yourself as a foodie. How did you go from being a foodie into this field?

Glen Matten: I've always enjoyed food and had that passion for food. Really, it's just like the little snowball that gathers momentum and gets bigger. Academically, I became fascinated with the properties of food, the components of food. I think one of the things that makes the sirtfood diet just so compelling is that we're not trying to isolate an individual component from food. We're really trying to usher in this new paradigm where we respect the complexity of food, and this really rich tapestry of bioactive compounds, this huge vast array of polyphenols that our food contains. Really, when we start to look at what effect that has on a cellular level, these are incredibly potent signaling compounds that can have some amazing benefits.

I think it's just the more you scratch away at the subject, I just think it gets completely compelling, absolutely fascinating. I think with this appreciation that we need to get our nutrients primarily from food, and that there is this whole rich tapestry of nutrients that we're really not tuned in to. There's been so much debate around what vitamins we should have, this whole debate around macro nutrients and how we manipulate those, the whole [inaudible 00:05:18] with calories and this obsession with calories. And we've missed the massive part of plant foods that are really influencing our health and that is going beyond micronutrients, macronutrients, calories, and seeing that there is this complexity to food that we're now beginning to understand. For me, that's mind blowing and something that I'm massively, massively excited about. I think we're at the dawn of a new era, a new paradigm, of how we understand why food is good for us and why certain plant foods are incredibly good for us.

Dave Asprey: You talked about plant foods here. What about some of these animal foods? Things like [inaudible 00:07:57] containing krill oil or some of the other things that are present in butter, grass fed animal fat? Are those a part of the story here?

Glen Matten: Absolutely. I think we're on no level saying we should only be eating plants. But I think it's making sure that plants have their rightful place alongside these other foods. We're not advocating vegan diets. We've actually got no particular perspective on that really. I think protein's very important. I think certain fatty acids are very important that we would find in fatty fish. I think it's about getting the best from the animal kingdom and the plant kingdom and bringing those together into a complete diet. We've got no sort or real agenda on that level, and we respect that people eat in diverse ways and it might be pescaterians, it might be people who enjoy and eat meat.

We're trying to bring the debate a bit further and say whatever way you eat, in terms of your intake of animal foods, if we can really harness the power of these plants alongside that, that's where health comes from. It's not through having meat or avoiding meat or having fish or avoiding it. It's about the integration of these plant foods in whatever diet that your preference leads you to. It's the integration of these very powerful polyphenols which [crosstalk 00:09:24]change our genes.

Aidan Goggins: I think it's almost like how I explain it to the athletes I work with. It's that the calories and the macros are the fuel of the cells and you mentioned it yourself I think in the products you sell. With the right type of macros and right type of food that you're eating, you can take the fuel you're eating from standard unleaded to high octane.

Dave Asprey: Exactly.

Aidan Goggins: And it's so important and so vital but we just can't look past the key essential part which is what maintains the function and the health of the cells. And that's what these polyphenols do. They repair and they eliminate the damage to our cells. They allow us to use the high octane fuel much more efficiently so you get the best of both worlds.

Dave Asprey: If you are not eating a lot of plants, you're doing it wrong. I think that's a core thing that all of us agree on. There's always questions, people saying should you do something else, and what I find is that a lot of vegans and vegetarians don't eat that many actual plants. They're eating plant seeds and lots of starchy carbohydrates and maybe not a lot of colored compounds. You get a lot of standard diet eaters who just eat a bunch of processed stuff with no polyphenols in it. You end up with this idea that few of us are eating enough plants and then, what do you put on the plants?

Aidan, you came at this differently. You became a pharmacist and nutritionist because you had your own disease that you needed to hack. Walk me through what happened there.

Aidan Goggins: I initially qualified as a pharmacist. I worked in the pharmaceutical industry and as a community pharmacist for five years. Then, overlapping with this, I also did a Masters in nutritional medicine and I'm proud to say, in nutritional medicine research and clinics. The driving force for that was I had an autoimmune disease. It was undiagnosed in earlier life and then in later life it lead to a lot of issues.

So I was half blind in one eye, I had six operations, every MRI showed huge inflammation that the consultant wasn't able to bring down, hence the operation repeats. I went to every single nutritionist as well, and I wasn't able to get much success. So alongside the consultant I was working with, we really took it on as a personal project and discovered basically the intricacies and the

overlap of nutrition and medicine. In my case, it was actually a yeast problem where I had from birth a fungus inducing what's called Graves Disease, an autoimmune thyroid disease, and the thyroid burned out and then actually caused hypothyroidism and a lot of complications due to that. But now the inflammation on the last MRI is fully rescinded and now I am able to say I feel in the best health I ever have and it's fully under control. And that is true: medical knowledge employing the nutritional medicine values of food and just knowing how to incorporate them properly.

Dave Asprey: So I'm assuming the yeast you had was candida?

Aidan Goggins: No actually. It wasn't. It was brewing yeast. It was a rare condition. And it was actually researched in Israel, one of the endocrine hospitals there did the initial research on it. Autoimmune diseases can be induced by [inaudible 00:13:03] Basically it means, no more beer for me.

Dave Asprey: So basically you have beer allergy that triggered all of your problems?

Aidan Goggins: Beer, bread allergy. Yeah baking and brewing yeast basically. I was going every single day and invoking it and that caused a lot of knock down effects. It was the knock down effects that really caused the issues.

Dave Asprey: It's kind of astounding if you look at Pub Med which is an online resource of medical papers, and you look up *saccharomyces cerevisiae* which is Brewer's Yeast or baker's yeast or nutritional yeast as they like to call it [crosstalk 00:13:35]

Aidan Goggins: Exactly

Dave Asprey: It is associated with cancer way more than you'd like to see and it is one of the things on the Bulletproof Diet that is not on the green zone and is in the very bottom of the suspect foods list almost to the don't eat it list because it often contains MSG as well. So a lot of people are like, oh it has B vitamins therefore I'll take it. There's better sources of B Vitamins. It's called liver. But that's just me.

Aidan Goggins: That's it. It gets touted so often. I remember I went back home and I was like, to my mother, and I said so we discovered what it was because we done actually a provocation test where we done a pre MRI, took the yeast, done another MRI and then we moved it for two weeks, done another MRI and were able to see the changes in inflammation. My mother turned around and goes, "Oh! The nutritionist told me that that was really good for the brain and for development so I had that every day when you were pregnant. You were actually born with a yeast infection but the doctor said it was fine." That's valuable information.

Dave Asprey: My take on this, is that you guys are looking at cell level biology so you know what mitochondria are. They're the power plants in the cell, the subject of my

last book "Head Strong". These are bacteria. What do bacteria hate? They hate yeast and fungus because they're competing for the same fuel source so it's not too surprising that if have fungus or yeast or mold, that there might be some competition at the cell level where the body's like, "Could we get this outta here? Because we'd like to have our bacterial kingdom for ourselves."

Yes you can set up symbiosis and things like that, but I find way more people are sensitive to yeast than know it. And I find that the problem is actually much worse in the US because in the US we've been genetically modifying and breeding yeast to be highly aggressive and fast growing because we're lazy over here. And I say that, I embrace laziness because if I can do it in less time with less work, of course I'm going to do that. That's what's humans do. That's good. But that means the fast rise yeast here will create more of a reaction in people than the more traditional yeast that's oftentimes used in Europe. So it's kind of a fascinating thing to think even inter species varieties could matter, but it seems like there's a difference.

Aidan Goggins: Oh for sure. I think it's definitely an area that's on the radar. If you look at the research now, which is a different type of immune reaction, but [inaudible 00:16:10] antibodies have been commonly used in the differentiation of Crohn's and ulcerative colitis but now they say it could be leaked to leaky gut disease and they're linking it under a whole host of different autoimmune diseases. The researchers, basically at that level, still being perplexed how to treat it.

Dave Asprey: Oh I think that we are learning more and hopefully by talking about the fact that you probably don't want to eat that salad dressing that has nutritional yeast instead of MSG in it. Maybe that's not the best choice for you, and sprinkling it on your salad is probably just not optimal. Maybe you can handle it, but maybe it's not the best you could do.

So that's what led you into this. You got pretty messed up by something, you hacked the problem, you figured out what it was, and that led you to say I need the knowledge of a pharmacist and a nutritionist. How did that lead you into writing your book?

Aidan Goggins: When it comes to the books, just to clarify, Glen and I actually co-authored both the books [inaudible 00:17:04][crosstalk 00:17:04] "The Health Delusion" and "The Sirtfood Diet".

Dave Asprey: My bad. Sorry.

Aidan Goggins: That's just how we met I guess. So when we met on our Masters and we actually overlapped with the Masters, we formed a friendship that way. When we doing the Masters, what we realized was the nutritional evidence and the messages we were getting were so different to what was in the mainstream. It was so bad that we even approached the head of the course and said, "Why is nothing being done? Why are you not coming out and speaking up?" And she essentially

said, "Well, as long as in academic circles, we are accepted, we don't really care. Maybe you will do it." And basically that's what we did. Glen has media experience from before and we pitched a book called "The Health Delusion" which is basically a myth buster about our most common mistakes in nutrition, our misconceptions, and what we should be doing instead.

Dave Asprey: Which book came out first?

Aidan Goggins: "The Health Delusion"

Dave Asprey: That was the first one? Okay and the main point there? Give me the summary of what your findings were as you were working through this in school and as you went out into the world.

Glen Matten: We actually covered such a spectrum and in many ways I think that book was too ambitious in that we just had so many golden nuggets to share that we kind of just spilled them all out into one book. But this was a time when we didn't really have vitamin D on the radar, and we were really breaking a lot of the vitamin D story. But also, I think we were amongst the first people to sound a little warning bell that actually as with any hormone, and we really should regard vitamin D more as a hormone than as a vitamin, that actually there's a U shaped curve and over-enthusiasm and over-zealousness that we've seen in some circles with vitamin D supplementation can almost be as bad as not having enough. We sort of really broke that story but also gave it the first little warning signs that actually too much of a good thing can be a bad thing.

We really debunked this whole issue of high dose antioxidant vitamin supplementation, and really I think that's a big precursor to where we are today. And that's this idea that it was a commonly held belief that free radicals are bad, oxidated stress is bad. If we just take enough vitamin E, or vitamin A, or beta carotene, we can solve that problem. And lo and behold, as the studies were done that tried to demonstrate that principle, we found that actually those high dose antioxidant supplements, which on physiological, they don't really respect the nuances of how our cells work, are actually, potentially unhelpful or harmful. We began to unravel and unpick that and then look at plants and how plant compounds work very differently to high dose antioxidant vitamins because they don't act as direct antioxidants. Green tea isn't good for us because it provides antioxidants, dark chocolate isn't good for us because it provides antioxidants; it's the way these polyphenols act as signaling molecules that actually encourage our cells to become fitter, stronger, more resilient, more robust, which is where the sirtuins come in that I think is the real key here.

We began to show there was a much more nuanced understanding of oxidated stress and free radicals and actually we began to show that there was a different solution there. We talked about a lot of things. We talked about the importance of nutrition in pregnancy and the first two years of life and how we haven't quite got that right and how that's incredibly important for programming life long health. We really touched on a dozen huge issues in "The

Health Delusion" which have now become much more common discussion points. I'm sure lots of your listeners will be very ofay with issues like vitamin D and a lot of these big issues now.

But that's where we started. We just felt look, there's so much there in academia. Why is it not getting out there? And we just really thought we can be champions of taking those messages and delivering them in a way that the public could understand.

Dave Asprey:

A lot of people listening are still like, "Well antioxidants are good." But the idea is the way we make energy in our cells is through the process of oxidation. So if just suppress oxidation, like "Oh, wait! I can't now use oxygen and food to make energy." And when I talk about polyphenols and things you just mentioned, things like coffee and chocolate and tea and blueberries and all those sorts of things, the common way that we talk about it, "Oh, these plant-based antioxidants". And we say that because everyone has been programmed to think antioxidants are good just like we're programmed to say fat is bad. The bottom line is the right fats are good, the wrong fats are bad and when you look at plant compounds that make cells more resilient to oxidative stress, they're not actually antioxidants, but we still talk about them that way.

So for people listening, understand that if you get a natural plant based antioxidant, it's probably not really an antioxidant. It's more of a shield that helps your cells handle oxidative stress better so it can make energy better. That's why I've shifted over the last 20 years in my own supplements. Twenty years ago, from the anti-aging field, you need higher dose antioxidants, so vitamin C, vitamin E. And now we're, at least I'm to the point where I'm taking 8 Polyphenomal capsules and using things like plants and just ridiculous amounts of rosemary and oregano and all the herbs and spices in my food. Because my goal is to get 4 grams of polyphenols a day or more in my diet, which is four times what the average coffee drinking American gets. I'm guessing the UK diet is pretty similar in terms of polyphenol consumption. But this is what it takes if you want to live a long time. Eat your spices. It's not that hard.

Glen Matten:

I think you're absolutely on the right page. I think the game changer for us was realizing that biology and how cells work just wasn't that simple. You can't just chuck in a load of antioxidants to kill the bad guys, because reactive oxygen species or free radicals are ambiguous compounds. We need some. They fulfill some important roles in the body. We just don't want too much. It's a delicate balancing act.

I think the thing that was the huge game changer for us was discovering the concept of what's called hormesis. And this is the idea that a small amount of something that in a large dose would be lethal or fatal or very damaging can be very good for us. This really blew my mind when I began to piece this together, which is the idea that actually these plant foods are not really providing us with antioxidants. They're providing, if you look at the way polyphenols are absorbed



and metabolized, the body tries quite hard to excrete them quickly, to transform them, through detoxification quite quickly.

So the way to conceive of these polyphenols is more like weak toxins or messenger molecules. And what they're doing, is they're talking to our cells, they're activating the stress response system within our cells, and what do cells do? The same as they do in response to stressors like exercise. They adapt. They become, they produce a whole range of powerful responses which will be the body's inbuilt, indigenous antioxidant enzymes. It will be these incredible cell protective reactions which reduce inflammation which starts to reduce damage within cells. So really, the cells are responding to these polyphenols almost like they're weak toxins that activate these stress pathways in our cells and in response to that the cells become stronger, more robust, more resilient.

We spoke about mitochondria, for example. We know that if you eat the polyphenols that activate the sirtuin genes, one of the consequences of that is it will stimulate the production of more mitochondria, what we call mitochondria biogenesis. Really the way we should be conceiving of those great compounds in green tea, in coffee, in cocoa, in chili's, you know there's lots of these foods, in turmeric is actually as molecules, compounds within foods that stress our cells a little bit, enough to make the cells respond and adapt and become stronger and more resilient in the process. That's a massive shift for most people. The minute we understand this idea of hormesis, the whole world of nutrition changes.

Dave Asprey:

It's really funny because one of the things that helped me recover from a really bad toxic mold exposure, and I grew up in a house with toxic mold when I was a kid, and it caused all sorts of health problems including autoimmune thyroid problems and a bunch of other things, was I actually introduced more free radicals to have that hormesis or that hormedic effect. I used ozone therapy. I used rectal ozone and some intravenous ozone which, funny enough, that's huge amounts of free radicals pumped right into your blood, and what it did, is it told the mitochondria, "if you can't handle it, die." And the ones who could handle it get stronger and grow new ones and it was like turning the lights back on for me. It was really a profound thing, [crosstalk 00:27:16] so absolute isn't bad.

Aidan Goggins:

That's a very important point because when you expose yourself to that kind of stress, what you're doing is you're activating one of the key stress pathways in the body called the NRF2 antioxidant pathway. And this, when activated, activates 200 gene signaling pathways. And this whole process is auto-regulated. And through proper activation of that pathway, we actually get recycling of what we class as antioxidants, the [inaudible 00:27:51] and the coenzyme Q10, and these feedback in a self-regulatory format.

Now if you show up in bloods and show that you have low levels of these, the big question that you need to ask is do you have low levels because you have low intakes of these vitamins? Or do you have low levels because you are not sufficiently stimulating the NRF2 pathway which recycles them? Because if you

are adding in these supplements on top of it, you are feeding back into that NRF2 pathway again to then play a pathway that is already being regulated. So people taking these supplements, inconspicuously, are actually doing huge damage to their health. And an easy way to assess this? Am I getting enough of these plant polyphenols? Am I engaging in exercise enough? Have I engaged in fasting? If you don't follow them practices and you are adding in supplements, the chances are that instead of doing benefit, you are putting your cellular defenses down. To put it bluntly, you are increasing the risk of all chronic diseases. Increasing oxidated stress, you're increasing mitochondrial dysfunction, you're increasing inflammation; you're increasing the formation of advanced glycation products.

That's a big thing with our diet today. They're calorie rich and macro nutrient rich, but really polyphenol poor and these are the key drivers in a diet of these pathways and we never ever hear of anyone recommending a polyphenol intake. As you said yourself, you're trying to take in 4 grams a day, but the average American diet is 1/5 of the blue zones.

Dave Asprey: It's a real issue because a lot of times you think you're getting them. Oh I'm going to eat a bunch of plants, so you put some broccoli or something in there. You're not really getting very much polyphenols from even vegetables. Some have more than others, but it's the herbs, spices, tea, coffee, chocolate that have orders of magnitude more in them. And it's just hard to put a chocolate sauce on your broccoli because it doesn't taste good but you're going to get more from the chocolate than you are from the broccoli.

Aidan Goggins: Well here's the thing. If you take broccoli, you boil it for three minutes or steam it at high temperature for five, you NRF2 activating sulforaphane does not exist because you've destroyed all the [inaudible 00:30:14]. You could eat a field of broccoli that way and someone drinking a few cups of coffee is getting far more benefit.

Dave Asprey: There's a hack for that. What I recommend is that if you're going to cook your broccoli which makes it taste better and there's reasons to maybe not eat too much raw broccoli anyway, you can take a tablespoon of raw broccoli and make a pesto out of it or you can eat some radish that has the enzyme that will unlock the sulforaphane that's in the cooked broccoli.

Aidan Goggins: Exactly. Radish is what's in wasabi or mustard or even raw broccoli contains a thing called ESP which blocks, which forms nitriles. There's a study done on the ideal way to cook broccoli, which I'm sure was a very exciting study. The conclusion was sixty degrees Celsius for 3-5 minutes. Anything less than that and ESP formed, stayed, ending in both [inaudible 00:31:09] got destroyed which bonds with beneficial nutrients. It's a bit of a minefield and I think we just need to be clever. Good intentions are not good enough. We're seeing that in the rare diseases and ill well-being around us. People need to educate themselves and that's where the value of things like this podcast for example come in.

Dave Asprey: You've done some interesting work on your diet recommendations and they're dialed in enough that Adele, heavy-weight champion David Haye, Pippa Middleton, you've got some pretty successful people using the diet because I think they're feeling the difference in the polyphenols. But what else are they feeling? What happens when people go really heavy on the sirt friendly foods?

Aidan Goggins: So Adele and Pippa were [inaudible 00:32:04] people on the diet, but we have had people openly talk about it and the benefits they've gotten and these usually always come from athletes. Connor McGregor, David Haye as you mentioned. And the reason that people like these are such big fans of it, because they are people who have such high demands for their body and they need them to work so efficiently that when you're at that 99% you notice the difference of whether the mitochondria are functioning efficiently or something's sluggish. You don't have to wait 20 years to see if you get a disease or not. I think focusing on polyphenols allows you to have a shift from eating the fuel your current body demands to fundamentally change and enhance how your body functions.

Dave Asprey: Alright, here's a funky question for you. I've read some not well documented claims, usually from remote parts of China, of people who live very exceptionally long lives on a diet of mostly tea and herbs and Chinese herbs and things that are almost exclusively polyphenols and not even that much raw macronutrients. So they're essentially semi-fasting, but when they're not fasting it's the most polyphenol rich foods possible. Do you think that people can or should experiment on this high polyphenols while fasting or almost fasting for longer periods of time?

Glen Matten: I think it's an amazing question that gets to the absolute heart of what we're interested in. One of the things that stimulated our interest in this field was the realization that these polyphenols, these specific polyphenols that we talk about in the book actually activate the same pathways on a cellular level as fasting and calorie restriction. So that became really interesting to us because fasting intimate and fasting diets and caloric restriction have become a big talking point and rightly so. There's a huge amount of research showing the health benefits of that practice for increasing health span and very likely increasing life span as well.

We regard these polyphenols, and it's not just us, this is widely discussed in the scientific literature, as caloric restriction mimetics which means these polyphenols have the ability to mimic the effects of fasting and calorie restriction. So that, for us gives a real interesting perspective on this because we think that if you adopt elements of intermittent fasting or calorie restriction and add in these polyphenol rich foods as the basis for your diet whilst doing that, really what you're doing is you're taking that diet to the next level. You're increasing the activation of these sirtuin genes which orchestrate this myriad effect on our cellular health and potentially our health span and life span.

So for us, doing that type of diet without these polyphenol rich foods means you've lost the dimension to the health benefits. You adopt a practice of fasting and you add in these polyphenol rich foods and you're essentially ramping up the benefits from doing that. I would go as far to say that if you don't add in these polyphenol rich foods, you're compromising the benefits you can potentially get through any form of fasting approach.

Dave Asprey: So we're in full agreement on that front and definitely intermittent fasting with polyphenols I find works better. There's a few people out there who would say, "Oh if you're doing fasting, it has to be water only." What's your take on fasting with just water versus fasting with tea or coffee or polyphenol supplements or I suppose fasting with wine is a bad idea but?

Aidan Goggins: As I mentioned, with fasting what we know is there's a cap on the benefits. If you work even on a clinical basis and measure things like hormones and different reduct factors on cellular stress, you will see that U-shaped curve of benefit before stress becomes too much and harm occurs.

What we know is, the way that these polyphenols work, it's not to directly stimulate the exact same pathway but to facilitate activation, which means it raises that cap. It raises the ceiling of which benefit is no longer exists. It allows people to experience much greater benefit and to buffer them from going into what we call the danger zone. So for people, I think it's just an old age thinking of fasting and it's one that has been with us for millennia even through religion. They were so spot on but we have the science and the understanding now to appreciate, okay, we can make it better. And if we can make something better, we should do it.

I don't know even if I said why might my interest in polyphenols comes from. That comes from my days in pharmacy because people's understanding is that there's this big dichotomy between big pharma and nutrition, and my belief is there could be nothing further than the truth because 50% of drugs now start as plants, plants that we overlook nutritionally for their medicinal benefits. We take some of the most common drugs today such as aspirin, statins, and metformin. If you take statin, we say it lowers cholesterol but we know directly lowering cholesterol has no benefit at all.

Dave Asprey: Say that again louder.

Aidan Goggins: We know this, so many stories. So many people come into my clinic with high cholesterol and I say I can lower the cholesterol. We're just appeasing the numbers man. So why does the statin actually for some people have benefit where a drug that just directly works on cholesterol has no benefit at all and may actually raise harm? We now know that cholesterol is basically the warning light on the dashboard of the car and lowering cholesterol directly is just removing the light and not fixing the underlying problem. So if you look actually how these drugs work, they actually activate these cellular pathways that are not getting activated by our diet. So we look at aspirin, activates the AMPK

[inaudible 00:38:47] pathway, statins activate a nitrate oxide pathway and balances sirt sensitivity and metformin activates AMPK, sirtuin and NRF2 of regulating our defense systems, increasing our mitochondrial function. This is where the benefits come from.

We've had metformin, we've been researching it for about 60, no, about 80 years now. It took 60 years for approval onto the market and it's only the last 10 years that we understand how these work. And now that we do understand how they work, we've got a big question to ask. Should we be relying on the drugs which are piggy backing off nutrients to activate these pathways for us which more than the majority of the population do today? Or should we take that knowledge and say okay, we now know what to do. We can add these plants directly into our diet and we can get a whole synergy of benefits. Because I can tell you this. If you include these in the right amounts at the right quantities, we have the studies out there such as the predimed diet that the benefit exceeds any of these prescribed drugs for chronic diseases.

Dave Asprey:

Metformin is interesting because it's a well known Type II Diabetes drug and it's been used in the antiaging field for a while because it mimics fasting. So about a dozen or so years ago, I met with Biomarker Pharmaceuticals. These are the first guys to see what gene expression changed with using Metformin. At the time, I'd been on Metformin for a couple of years for anti-aging reasons and this was somewhere down in Silicon Valley and I kind of walked in with all these white lab coat researchers and said, "Hey! I've been taking it for a couple of years for anti-aging," and they kind of looked at me and they're like, "Do you mind if we ask how old you are?" And I'm like, "Yeah, I'm 74," and they just about fell out of their chairs.

Since then, what research has shown, if you take Metformin it permanently reduces your ability to absorb vitamin B12. But if you take the AMPK herbs that metformin is essentially derived from, it doesn't do that. With aspirin, there's white willow bark. So all these things, if you go back to the plant compounds, you get the benefits but you don't have the same types of downside. This is a really good argument to say, number one, let's keep our soil healthy. Let's make sure we have really good herbs and vegetables and other things growing because if we can't grow these compounds, we're not going to be able to synthesize the one active because it's a synergistic thing. Sounds like you guys are on path with that vision as well where you're better off to go to Mother Herb than you are to go to the compound?

Aidan Goggins:

Exactly. As drugs go, Metformin's probably one of the most amazing drugs out there and we know that for proof, even the FDA has accepted that now because Metformin is the only drug that has been approved by the FDA to be allowed to be classified anti-aging and that's the pane trial. There was a study on Metformin where they showed diabetics who took it lived longer. Obviously, living longer than other diabetics isn't a big boon, but what they showed was they lived 15% longer than healthy individuals without diabetes. They showed

how Metformin helps with the middle aged spread. It stops the increase of insulin resistance in healthy individuals and we accept now as part of aging.

As you said, it comes from French lilac. It was used in the 1800's to treat sweet urine which we now know is a clinical sign for diabetes. What we've taken as a drug is, we've isolated a compound and made it more potent for specific pathways which also makes it more potent in it's toxicity.

And the question we've got to ask ourselves is are we happy to do this with one nutrient and just continue to take it or are we allowing ourselves to believe that if this nutrient can do it, what about a synergy of nutrients that have been shown to have the same effects? And that if we take them in a whole food in sufficient amounts of the right type of foods, there's an awareness of these types of foods, they could produce such huge benefits. And we're not talking about one specific condition. We're not talking about diabetes. For example, when we treat heart disease, then we have an Alzheimer's problem. We treat diabetes, we have a cancer problem. We're talking about when we activate these pathways we see the rates of all chronic diseases go down because we're targeting the very cellular function which happens to go out of whack basically in these diseases.

Dave Asprey:

It's awesome that you put it that way. One of the things that concerns me the most, I've seen a bunch of, even like big documentaries and things, people saying, "Heart disease! You have to eat this radical, low fat, lots of beans sorts of diets." And they're saying it's about heart disease, heart disease, but the things they're recommending are the same things that raise cancer risk. Like I think this is what killed Steve Jobs. You go on a diet like that like, okay yeah, you've raised your cancer risk but you might have lowered your heart disease risk. But when you're looking at the mitochondrial foundation for all of these, even something like Metformin which is reasonably safe, it reduces mitochondrial function. In studies, anyone can Google mitochondria Metformin, that's why I quit taking it. But do I take herbs that mimic the effect so I get the same gene expression? You bet I do.

Aidan Goggins:

That's it exactly. I mean there's studies for Metformin I've questioned whether it stops exercise adaptation. And again that comes back to your mitochondrial function. But don't forget, what we're doing with Metformin, we've isolated to a very specific pathway. I don't know if you've heard of a biotechnology called New Sirt and what they are doing now is investigating taking Metformin and saying what about we add in nutrients that activate extra pathways? So [inaudible 00:44:42] the amino acids for the sirtuin pathway and nitric oxide which enhances as well which increase mitochondrial efficiency. Nitrates, very commonly used by athletes, for mitochondrial efficiency. They are showing that not only are they needing a much lower dose of Metformin to get the same kind of clinical effects or proving the synergy of nutrition, but that the suggestion is that the effects go well beyond the limitations of normal Metformin.

Dave Asprey:

In fact, for people listening, if you were sort of geeking out on this, I'll tell you there's an herb called gynostemma which is a Chinese herb and there's something from rose hips, there's lilac, and all of those things are more effective than the pharmaceutical drug if you take them. It's one of those things where you look at that, like why did you not know that until now? You didn't know it because there's a focused marketing machine around a patentable drug, although it's off patent now finally so you can get it generic.

I think there's a great case to controlling your AMPK pathway if you want to live a long time, if you want to perform well as an athlete, you don't want to get Alzheimer's, you don't want to get cancer, you don't want to get heart disease, you don't want to get diabetes, all these things. But maybe you should fast, maybe you do high intensity interval training, and maybe you should take some herbs instead of some drugs, just saying. And you guys have been leading voices in getting that message out there so, thanks. Did I miss any of the herbs? What else do you recommend for that? Like just kind of my own stack?

Glen Matten:

Well I think Aidan's really touched on this. We're not really focused on a specific food or a few specific foods. In the book we identified 20 foods with a spectrum of the polyphenols at high levels that we know influence these very fundamental pathways in our cells. We've mentioned some of them. Coffee would be on that list. Green tea, especially matcha green tea would be on that list. Kale is very high in certain of these compounds. Certain herbs are even things like parsley, a great source of certain of these compounds. I think our message was look, we need to get away from thinking about super foods or one food will solve this problem. And if we are to get in effect more powerful than these drugs, then we really are to put a huge dent in chronic disease, we need a spectrum of these nutrients at really meaningful levels. It's not just adding one food to your meal. It's about eating a diet where these foods are universally included.

We really encouraged, we kind of created a specific juice which was part of the diet where we could really concentrate these polyphenols from green leafy vegetables and herbs and adding in matcha green tea. The power of this approach comes from not eating one or two foods. It comes from eating this spectrum of foods which gives us this tapestry of polyphenols at really meaningful levels. It's like a missing part, it's a missing component of modern diets, this lack of polyphenols. But the power comes from the synergy. And there's lots of research to show that you synergize these nutrients, they become much more than the sum of their parts.

Aidan Goggins:

We need to be clever about it as well. I said that earlier, I'll say it again. Because good intention isn't good enough. You need to know what the foods are but you need to go beyond that. If you take turmeric for example, potent in vitro studies, it's really good for gastro intestinal tract. The reason it's so good is because we don't absorb it. So you want to take that for a cellular effect, you have to add heat, you have to add black pepper, you have to add fat or

alternatively, add alcohol. So if you want to make a tumeric cocktail or something, that could be quite beneficial.

We hear the benefits of dark chocolate, but if it's undergone dutching, so much of the flavanols are taken out of it, so we need to look at the label and say has it been dutched? Are there any processing techniques which is removing these beneficial compounds? So often in the food industry, they are caught up with low fat or sugar content or calories. They will do any kind of processing technique to reduce this and a lot of the actual nutrients which give us the benefit.

Even things, you take green tea. How many people know that adding in an acid like green lemon or adding in a small bit of honey stabilizes the [inaudible 00:49:24] and increases the absorption of them? How many people know that while onions have been shown to reduce Alzheimer's, it's only a special Japanese brand that have been bred with a really high amount of [inaudible 00:49:37] and actually we don't get in normal onions, we get them in shallots, we get them in capers, so that's what we need to do if we want to get it?

If we take garlic, how many people know that if we add it into the frying pan, heat stops the formation of [inaudible 00:49:48] straight away? If we have it in our salads, stomach acid stops the formation of [inaudible 00:49:53] straight away which is the beneficial compound. So we need to chop it, we need to leave it for 10 - 15 minutes to allow that to form. Berries, some polyphenols aren't harmed by freezing them, some are reduced by freezing them. We mentioned things with the broccoli earlier. Or extra virgin olive oil versus olive oil, I just think you're crazy if you don't go with pure extra virgin olive oil. The benefits are all in the polyphenols which aren't found in the normal one.

Dave Asprey:

So I have to pick on you guys in the UK. When you add milk to tea, milk sticks to the polyphenols and you don't get to absorb them. So I know it's a traditional drink over there, but seriously, don't do that anymore. The UK has a much higher incidence of stomach cancer than they should have given the tea consumption, because tea is against stomach cancer and it's because of the habit of putting milk in there. So sometimes it's about mixing the wrong foods at the wrong times. This little detail, you don't have to be an expert on this, but you definitely want to have some of the right recipes and get it right most of the time. And if you just love milk in your tea and you do it sometimes, I don't care. But if you do it all the time, because that's the way that you always did it and you don't even know that it's costing you something, maybe there's room for additional knowledge. It's just a small change, but it can make a big difference when you're old.

Glen Matten:

I mean you're absolutely spot on and we sort of cover those little hacks and those little tips in the book, but you're absolutely right. The same applies to coffee as well, if you're adding milk to that, then you're very likely to lose some of these polyphenols. It's those little things that make a huge difference. Knowing that dark chocolate has more flavanols and which chocolates have



really had them decimated. Those little adjustments, adding some lemon to your green tea, there are simple things that we can all do that make a huge difference in terms of getting these precious compounds into our body and into our cells which is where we want them.

Dave Asprey: Beautiful. Well I'd like to ask each of you one final question and I guess we'll go in order here, so Aidan, I'll start with you. If someone came to you tomorrow and said, "Look. 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?

Aidan Goggins: On a nutritional level?

Dave Asprey: No, no. In general. You've lived an interesting life, so nutrition can be part of it but doesn't have to be.

Aidan Goggins: I stick with nutrition because at least in that area I practice what I preach. There's no point in saying don't overwork when I'm doing 16 hour days at the moment. I can tell you from my own experience, we all need more holidays, that's for sure. I think if we were doing it for health, we'd be taking a holiday every 8-12 weeks. Again, I don't practice that.

Dave Asprey: That should be your number one though. You don't have to practice your own advice, but you tell people to do that. I like that.

Aidan Goggins: I think every single person, I haven't met a person that doesn't need an increase of polyphenol intake. And when you're talking about your dietary sources, we're not talking about the issue where we're taking too much of a supplement where it can have an adverse effect and a negative feedback or turn from a pro-oxidant to an antioxidant or vice versa. So everyone whether it's a vegan, a vegetarian, or a standard American diet, I haven't met someone who hasn't benefited from incorporating these foods and just being aware of what type of foods you need to add.

In terms of switching from that, I don't think all supplements are bad. So I find in the U.S. and the UK, everyone at the Northern latitudes, I think vitamin D has a huge benefit because we just don't produce it. And the most recent research on vitamin D has shown that it's not just low levels that have problems. [inaudible 00:53:43]yo-yo-ing as well which can cause serious cellular consequences so when we get that peak in the summer and that dip in the winter, even though you say that's natural because of where we live, it actually showing in studies, it is not good for our health in any form at all.

In the UK, one of the reasons our health may be compromised versus the Americans is we don't have the mineral called selenium in our soil which is really key for inflammation and oxidative stress and regulating body enzymes. Anyone who comes in to me in the UK, I recommend that they always go on a selenium

supplement and not eating food from abroad, I always do lab tests and test them but I've never seen a UK person didn't need a selenium supplement. It doesn't come from our food. People say get it from Brazil nuts, Brazil nuts have too high a variation and Brazil nuts are high in radium, Brazil nuts are high in barium, so people should not be eating high amounts of Brazil nuts.[crosstalk 00:54:43]

Dave Asprey: Also high in mold. Find a Brazil nut that's not moldy. They even smell like it. That's not one of my favorite foods.

Aidan Goggins: And I guess that covers three in total because I don't want to take time off Glen. I know I've been yammering on.

Dave Asprey: Nice. Glen what do you say?

Glen Matten: So yeah. I've got three things pretty much lined up here. The first thing is if somebody comes to see me and says I want to be the best I can be, the first thing we need to do is understand that person as an individual.

I'm talking about their individual nutritional needs, their hormonal, biochemical and really there's ways we can do that. Both myself and Aidan are massive believers in biochemical testing, really in depth sophisticated testing of nutrient levels, hormones, inflammation, how the immune system's functioning, how the gut's functioning. And if we really want to experience the best possible health, we need to respect that we're all individuals. Different things will work for different individuals and it's tuning into that by whatever means. Some people will do genetic testing to understand things from a neutrogenomic perspective, but we need to put the individual at the center. We can't have a one size fits all approach to health. And I think Dave, what you said about your sort of health background, Aidan's example of that as well, if we can't tap into the individual and what's going on within that individual, it's very difficult to get these great results on an individual basis. So that's always first for me, is just respecting the biochemical individuality of each person.

The second one for me is embracing this concept of hormesis. You know, for me it's just a massive paradigm shift to understanding how we can use food to elicit a really powerful response in the body. And you know, how does exercise work? We know exercise up to a certain level is really good for us because it's stimulating this adaptation. We know the same is true of fasting. Up to a point is incredibly beneficial. And the same is true of polyphenols. And if we can embrace this idea of a little bit of what doesn't kill us makes us stronger, whether that's exercising, fasting, or polyphenols, then we're really at the cusp of a paradigm shift in how we think about health.

And my third one is look, let's just learn from traditional cultures that experience amazing health because I can tell you now they're already doing all the stuff that we're thinking we're really clever in discovering. They understand

fasting. They understand movement as a natural part of daily life and if you look at any blue zone culture, their diets are universally rich in polyphenols. Different ones in different geographies, but this spectrum of polyphenols is a universal finding at high intakes, high dietary intakes is a universal finding across all of these blue zone cultures. I say, look let's learn some lessons from them and actually look at these cultures as a way to understand this whole paradigm that we're now beginning to unravel.

Dave Asprey: Beautiful. Thank you for that. Guys, thanks for being on Bulletproof Radio.

Aidan Goggins: Great being on.

Dave Asprey: Alright your books are called the "Sirt Food Diet" and "Health Delusion" available where books are sold and I appreciate your work. I appreciate you raising awareness of polyphenols as something that really, really matters and how they're different than antioxidants and better than antioxidants. And I look forward to meeting you sometime in the UK.

Aidan Goggins: Excellent.

Dave Asprey: If you enjoyed today's show, you know what to do. Head on over to Amazon and leave a rating. Anytime authors like Aidan and Glen or me see your feedback, it makes us know that the work we're doing matters so thanks a lot for just taking a minute to do that. It's something that if you spend 3 or 4 hours reading book that we spent thousands of hours writing, it's just a quick and easy way to say thanks, so I appreciate you for doing that.