

Dave Asprey ([00:00:00](#)):

You are listening to the Human Upgrade with Dave Asprey. Today is a super nerd longevity muscle performance episode and it's because we're going to talk about Sulforaphane and NRF two activation. It's a live interview, which are my favorites here in Austin, Texas at my studios. And if you're watching on YouTube or any of the video channels, you recognize that there's two guys here. One of them is Dr. John Gilday. Johns Hopkins trained PhD with only 60 scientific publications from 20 NIH studies, so he's just getting going in his career. He's an expert in cell culture and exosomes, which you've heard me talk about on the show before related to stem cells and things like that. And he's the guy who figured out how to stabilize the sulforaphane compound, which you might've heard of, especially if you read my longevity book called Superhuman. I talk a lot about NRF too.

([00:01:04](#)):

Well, it's kind of an honor to have the people who did the work in the labs and have done all the things that aren't in their papers. So I'm going to get to go deep and you're going to get to participate and understand what could you do for your NRF two pathways and what would be in it for you. And our second guest here is David Roberts, a masters in public health from Johns Hopkins, masters in biochemical engineering and 20 years of public health experience on three different continents. So we have some guys who are, well, we'll save, very experienced in the field and part of my job for you on the human upgrade is to find people maybe who haven't written books and are deep in the trenches, but have deep knowledge that they can share with you that are going to help you make better decisions. So you're more in control of your own biology. And the company that they work with is called Brock Elite, which is really the only way to get the stabilized mix of things that is shown to work in studies. So John and David, welcome. It's an honor to have you in the studio. Yeah,

John Gildea ([00:02:10](#)):

It's great. Thank you Dave.

David Robert ([00:02:11](#)):

Thanks for having

Dave Asprey ([00:02:12](#)):

Us. Alright. Should kids really eat their broccoli? If so, why?

David Robert ([00:02:16](#)):

Kids should eat their broccoli? Yes. I mean just we have a supplement. We don't say, Hey, skip your broccoli. Part of it is, if you think about it, their benefit benefits outside of sulforaphane and especially with microbiome. So yeah, I'd say we're fans of broccoli pan of mature broccoli.

Dave Asprey ([00:02:39](#)):

Okay.

John Gildea ([00:02:40](#)):

You'll hear us talk a lot about synergies and one of the ones that when this topic comes up we'll often talk about is that sulforaphane is the most published molecule from that plant, but there are many others and we were interested in really stabilizing all of them. If all the ones that are made by the one enzyme called mease in the adult broccoli are two compounds that have been shown in papers to be synergistic with sulforaphane and that's dim NE three C. And so even if you're taking our product, we would say eat some adult broccoli getting two compounds that aren't in ours.

Dave Asprey ([00:03:27](#)):

Why not broccoli sprouts?

David Robert ([00:03:29](#)):

I was going to say actually before you asked that, we're also big fans of broccoli sprouts.

Dave Asprey ([00:03:33](#)):

Okay. So I heard a dull broccoli several times just because it's more studied or it's bulkier.

David Robert ([00:03:38](#)):

I mean it depends on what you're going after. I mean, most people won't necessarily be disciplined enough to grow broccoli sprouts. If you are, then that's the way to go because the broccoli sprouts actually have about 50 to a hundred times more of the good chemical, which is sulforaphane than the mature broccoli. And it's easy to do, super easy to do, but I mean not everybody will do it.

Dave Asprey ([00:04:05](#)):

I've seen studies on thyroid suppression from isothiocyanates, from excessive brassica consumption. In fact, it happened to me when I was a raw vegan and ate stupid amounts of kale and broccoli raw and all of that stuff. Are you concerned about isothiocyanates, which is an ingredient in broccoli

John Gildea ([00:04:23](#)):

As interesting is the bad guys are the adult versions of the chemicals. So I three C and DIM are the major culprits for that. But sulforaphane can those studies that you're talking about where they talked about decreased function of thyroid only happens when you have low iodine. In that context, you can decrease thyroid function, but there's a number of papers that show that sulforaphane itself, if you don't have iodine, actually improves thyroid function.

Dave Asprey ([00:05:04](#)):

Oh, this is interesting. So there's two compounds on there and if you're getting the sulforaphane, which is I would say the most precious molecule in broccoli you're getting at. That's correct. I've taught people for years that when you eat cooked broccoli you ought to have a piece of uncooked broccoli or a piece of radish, which will do the same thing and kind of smash it for a minute and then eat just one bite of that. Can you tell me why that is? Good advice?

David Robert ([00:05:28](#)):

Yeah,

John Gildea ([00:05:31](#)):

Why don't you take this one? I can go too deep and reveal secrets.

David Robert ([00:05:35](#)):

Yeah. Well, I mean part of it has to do with the whole chemical reaction that's happening. So basically most of the broccoli supplements on the market have what's called glucoraphanin, which is also called sulforaphane glucosinolate to throw people off to think it's sulforaphane is my opinion on that. But it's the precursor molecule, so it's stable, so you can put it into capsules. So in that mature head of broccoli, you take a bite of it that's raw, you start chewing it and it breaks down the cell wall, which has mease in it. That mease gets released, it has a chemical reaction with the glucoraphanin and produces sulforaphane. And so you swallow it, you get the benefit. So just having the Glucoraphanin products though out there, which is the vast majority of the broccoli supplements, there is one other their sultur product on the market that's from France. So we say we're the only naturally derived S sultur product that they derive theirs through chemicals of sulfate solvents. But basically the Glucoraphanin, those supplement companies say you swallow the glucoraphanin and your gut bacteria can convert it into,

Dave Asprey ([00:07:01](#)):

They'll magically do that if you have the gut bacteria.

David Robert ([00:07:04](#)):

And so our hypothesis is that the people who really need that conversion don't have the right gut bacteria. And so it's a crap shoot.

Dave Asprey ([00:07:14](#)):

It's a common thing that supplement companies will do. You'll see these vegan companies say we have vegan omega threes. Guys, it takes 45 grams of those to convert to one gram of EPA and DHA. If you have all the enzymes and co-factors, which you don't because you're vegan, so you're starved of minerals so you can hope it'll happen. I also see people use wild yam extract because you can make progesterone from yams. It takes seven steps in a laboratory that is not in your gut to do that. Wild yams don't affect progesterone, but supplement companies do this. And so what you guys have done, clearly you have a little bit of science backing what you're doing. So with broccoli you put together the actual phytochemical and then you stabilize it in a way that's unique. Can you talk about why only you guys can do that or is that like a trade secret?

David Robert ([00:08:04](#)):

Yeah, I mean we purposefully, because it's pretty hard to do trade secret did it? And in fact, we were the ones who were making it all the time and it's pretty backbreaking. And so yeah, you hear about putting patents in and then the Chinese ripping it off. And so we were like,

Dave Asprey ([00:08:24](#)):

I'm not asking you to disclose if you can, it's fine. Joe Rogan did that to me. He's like, tell me how you make Bulletproof coffee because he's an investor in a company that was trying to copy Bulletproof Coffee. And I'm like, Coke doesn't give you the recipe and neither am I. It's a fair answer, but we'll say you've discovered a proprietary way to stabilize it that no one else can do. So I don't have to count on maybe my gut bacteria and breaking this down. And guys, if you're saying I don't want to take it another supplement, fine, go out and buy a pound of broccoli, look at how much that costs, and then cut off a little bit of it, smosh it up, cook your broccoli or do whatever torturous thing you're going to do. I recommend steaming and then blending it with butter instead of olive oil and then eat your bitter broccoli stuff and eat the thing. Okay, cool. You got some sulforaphane. That's the way to make it. I just don't do it that often. Although I have at times in life, yeah, we estimate about five pounds mature broccoli in wood serving, which is two calories. So just be vegan. There's protein in broccoli, right? Just very little. You're angering the vegans. You can't say there's not protein in broccoli. So

John Gildea ([00:09:25](#)):

It was interesting when you're talking about your biohack of getting some sulforaphane from adult broccoli, that's the first time I've heard of that. And it makes sense because the enzyme is heat unstable and the product is heat stable. And so by cooking the broccoli, well you're probably breaking down some of that cellular material and so that you can release the heat stable version of the precursor and then you're taking the live broccoli where you'll get the active enzyme and it's a very active enzyme. It's very processive,

Dave Asprey ([00:10:01](#)):

It's super active. So when I was running the upgrade cafe in Santa Monica for about eight years, I had a restaurant based on my recipes. Anytime you got cooked broccoli and cauliflower and stuff like that, there was always a piece of watermelon rind on top because that contains the same enzymes and people didn't know why they were doing that, but it was to release the sulforaphane from it because this is a really potent in our NRF2 activator by the way. It so is coffee, right?

John Gildea ([00:10:26](#)):

I don't know. That was the CIC acid.

Dave Asprey ([00:10:29](#)):

I'm trying to think of the studies in superhuman. And it was Alberto Varo who's a drug discovery guy in the jungle turned shaman after. He is like, well, no one has heart disease. Screw that. I'm staying here to learn why. And we've talked about NRF2 activation and I believe it's either fasting and coffee, something like that. But that's interesting. So there's different ways you want to do this, but talk to me a little bit more about the longevity and performance impacts of NRF2. Why would I play with this compound in my body?

John Gildea ([00:10:57](#)):

I think the clearest data, I mean because I'm just thoughtful of person, a truth fly person in my PhD, we're sort of elitist in the respect that we think the only way to really study biology well is to do a genetic screen, completely unbiased screen. You find a phenotype that you're interested in, you knock out one gene at a time and a gigantic screen. And in all the genes that are involved in that end up being the things that are pointing towards that effect, that phenotype. So I think in the longevity field, C. elegans really has been way out in front. And there are two C. elegans people at Hopkins when I was there. So I got a lot of C. elegans related training.

Dave Asprey ([00:11:46](#)):

What that means to translate for people who are less laboratory oriented, you can basically do experiments in bacteria and stuff like that. You can do research on nematodes and then fruit flies. So in sort of the hierarchy of longevity research and then after fruit flies, then usually you do mice and then after that you might as well just do some human trials and measure it with an aging clock. And that's kind of how a drug or even a supplement might be tested. We discover it in these low level creatures when we move up. And so you worked at basically step two of that process.

John Gildea ([00:12:14](#)):

So I think a really interesting set of studies, a very complete set of studies for the longevity and SEA elgan is they have nine major genetic groups that show longevity. And so they added sulforaphane, got extra life in the sea, elgan the steel worm, and then they knocked out those nine pathways one at a time and it was one of 'em that completely blocked the benefit.

Dave Asprey ([00:12:47](#)):

Wait is elegance the worm or the fruit fly?

John Gildea ([00:12:49](#)):

The elgan is the worm.

Dave Asprey ([00:12:50](#)):

I was confused their name. What's the name of the fruit fly The PHI one. Ah, I got it back anyway guys, what I just said there, I switched the first two. So it's worms. So you're at level one

John Gildea ([00:12:58](#)):

Basically? Yeah, yeah. So this one is the elegance. And so that pathway is igf, so it's the insulin pathway and IGF one. And so from just as a little bit of background in IGF one that is in the diabetes world, your insulin level is high, your fast aging, you're speeding up aging insulin resistance course is terrible thing. More than half population probably is insulin resistant.

Dave Asprey ([00:13:32](#)):

And you would measure this by HBA one C. If you're using upgrade health, that's one of the markers that we measure for you, which measures what's the average level of blood sugar and therefore insulin over the last couple months and you want it under 4.9?

John Gildea ([00:13:48](#)):

Yeah, perfect. So you can make that jump between this little tiny worm that only has 800 and something cells in it the whole way to humans that there's consistency all the way along all of the model systems. And so because insulin IGF one signaling turned out to be the major factor in C elegans that that's one of the main ways that it works in humans. And so insulin is how you get glucose into the cells. And so it's driving function and when you do that well, you're driving function well. And that whole pathway that's downstream of it is all related to all the other things that we talk about. How mitochondria work, how you utilize oxygen, all the big things. So when you try to go from worms to humans, then we can show that if you take sulforaphane, your blood sugar comes down quickly, stays down, and if you do it for a while, your insulin comes down over time. And so that is one of the main pathways. And I like that one just because it's so consistent across all of the genetic models and in humans and longevity

Dave Asprey ([00:15:11](#)):

For you, if you're listening to that going, that's a lot. Insulin if it's high is dangerous. Insulin if it's low, is actually more correlated with all cause mortality. In other words, if your insulin is too high or too low, your chances of dying go up. So you want to be able to use insulin or its cousin insulin-like growth factor for what they do. That's good. They put on muscle, they cause tissue growth. So it's okay to have some insulin go up after you work out for instance, because that's when you'd want to build muscle. But what's not clear is what is the relationship between Nrf2 and IGF one or insulin like growth factor,

John Gildea ([00:15:49](#)):

At least in my mind is because of the major pathways that at the cellular level what it does. So Nrf2 is working on this. Sulforaphane works on this pathway where Nrf2, a transcription factor, but its basal state is to be degraded. So it's down and then it's waiting for some kind of insult before it's upregulated and then takes care of the toxins, the extra reactive oxygen species. So it's down normally and if you take a toxin it'll be up, but that's obviously just taking care of that toxin. But if you can get that Nrf2 to start signaling because we're in this world that's swimming with toxins at all times, you're basically preemptively turning on this system without an injury and it's doing, what it normally would do is mop up things. And so it turns on a whole set of enzymes because everybody talks about reactive oxygen species where you can take vitamin C, you get one vitamin C one reactive oxygen species, they're canceled out. This turns on a couple of hundred enzymes and each one of those enzymes is doing tens of thousands of reversal of reactive oxygen species over and over and over again. So it's really different than taking an antioxidant, which there's a lot of studies showing it actually blocks exercise recovery if you do it during exercise

Dave Asprey ([00:17:25](#)):

Will Nrf2 block exercise recovery the way antioxidants do.

John Gildea ([00:17:29](#)):

So we don't know that answer, but I wouldn't take it right before a take it after good workout. You take it

John Gildea ([00:17:36](#)):

After because afterwards it'll help

Dave Asprey ([00:17:38](#)):

You recover faster. Got it. One of the things that's interesting about NRF too, like you said, if it's higher and it's not because you got poisoned, then when you do get poisoned by pretty much being on an airplane or walking into an office building or smelling that person in Chanel number five or that kid bathed in perfume because they haven't learned that people don't like that yet. All of those actually are system level insults that go to your liver and your kidneys and your cellular detox systems. So if your inter of two levels are higher, your ability to be more resilient in the face of a toxic insult, even from an endotoxin from just eating the wrong burrito kind of a thing, you're systemically going to be more resilient, which correlates with longevity.

John Gildea ([00:18:20](#)):

That's a great example on, and I think a lot of people don't realize that however many times you've got one of those giant reactive ox oxygen species storm and made double stand breaks in your DNA is how many times you've recruited all the factors that maintain your genome are recruited over to repair that double stranded brake and you're distracting who you're supposed to stay. As development happens, you get all the genes turned on and off correctly, the rest of your life is forgetting what happened during development.

David Robert ([00:19:02](#)):

And I mean there's so many ways to get toxins. You can eat them, breathe them. Like you said, there's a study in two thousands when I was coming out of public health school of women who were breastfeeding who had flame retardant in their breast milk.

Dave Asprey ([00:19:19](#)):

Oh my gosh, thank you California, for forcing that in everything.



David Robert ([00:19:23](#)):

And they got it from sitting on couches that had the flame retardant. And so having the NRF two, so sulforaphane being the best natural molecule at turning on NRF two, having that NRF two on, it's the best. That helps with phase two detox basically. And so being able to clear those toxins, one of my favorite studies on detox is out of China Hopkins was there and all these municipalities, these speak cities, Chuck filled with all these pretty

Dave Asprey ([00:20:02](#)):

Horrible Mercedes

David Robert ([00:20:03](#)):

Black snot basically if you walk outside. And so they show just a broccoli sprout beverage taken once you pee out all these benzene. And so it works fast and it does clear the toxins.

Dave Asprey ([00:20:22](#)):

In my biohacking picture when I teach people how to be more resilient in the face of toxins, I fly all over the world and I have a pretty, well most people say, a high stress lifestyle. So I've conquered circadian biology, I don't get jet lag anywhere on the planet. I control color and angle of light and food timing and all this weird stuff. And I teach people how to do that. And then I look at glutathione as my frontline protector because it just gets rid of a lot of stuff in the, and then I look at calcium DG glucarate for that phase two gluc carnation, guys, you're taking notes on this, right? It's in all my books and all, but whatever. And then there's NRF two. So in those three, in terms of detox, do I do all three? Is NRF two more important than the calcium D gluc eight? Walk me through a real world, highly resilient. I walked into a cloud of auto exhaust and it fell to the ground around me and I conquered, give me that vibe. Yeah,

David Robert ([00:21:16](#)):

I mean John, I can go into more detail, but basically when he was talking about the anti accident response element that NRF two turns on, it's a 200 genes that create these antioxidants. Well, the glutathione as was it transverse tst? So basically those are some of the enzymes

Dave Asprey ([00:21:39](#)):

Produced. So if you're taking NRF two, you might not take glutathione because you're just going to make it anyway and you'll make it inside the cells. And most of the glutathione supplements you can take, unless there's certain mycells or liposomes, they're going to primarily go into the liver, which means if you took Tylenol or drank alcohol, good for you. But if you wanted the longevity effects of glutathione, it's harder to get it in. And I've had a few experts on glutathione with some nanoparticles and different ways to get it inside cells. And you're like, why add it? You just grow it by taking broccoli to upregulate NRF two. Yes.

John Gildea ([00:22:14](#)):

Okay. Yeah. So similarly to the first thing, that analogy of turning on antioxidant enzymes, same thing as with all the phase two detoxification enzymes. So NRF two is the major inducer of those sets of genes. It's a whole program made to get rid of toxins. So it blocks the reactive oxygen species that happens from a toxin and it turns on the detox pathway where if those toxins, they get bound by glutathione, then it's the whole process of binding to glutathione, making sure it's in its reduced state. So GSH to GSSG is, whether it's in its reduced state, so glutathione only works and it's a reduced state. It'll bind the toxin. And then glutathione as transferases are made to conjugate those two together. So it turns on all six glutathione as trans braces and then it turns on all of these processes that you were talking about and collation. So there's a whole set of things that are meant to carry that out of your body. So it'll get it out of the cell soluble transported into the interstitial fluid. And

David Robert ([00:23:32](#)):

Most people talk about it at three phases of detox. So basically sulur fame works in all three phases.

Dave Asprey ([00:23:38](#)):

This is really cool because I think everyone listening to the show knows there's a lot of toxins now that exist 10 years ago and there's from 10 years before that. And it's weird. People aren't fertile anymore. When I was 30, which wasn't that long ago, I sure hope that she doesn't get pregnant. My 30-year-old friends today are going, I hope I can get pregnant. And our fertility has dropped. And I know that a major part of that, not the only part, but a major part of that is just an increase in toxins. And because I had a lot of mold toxins as a kid, a lot of other things going on, and I was 300 pounds and had hormone disruption, I've paid careful attention for years to getting toxins out of my body, which has made me incredibly resilient, especially given where I came from. But one of the things that stood out with SULFORAPHANES is reducing symptoms as lethargy and irritability In autistic people, they have detox pathway problems. I know I used to have Asperger's syndrome until I got upregulated my mitochondrial function and got my detox pathways working and reprogramming nervous system, which is a huge amount of work. It's better to just not have autistic kids if you can avoid it maybe by NRF too. What do we know about autism? And its kissing cousin, A DHD and NRF too.

John Gildea ([00:24:57](#)):

Beautiful study. We've talked about it a number of times and as far as we know,

David Robert ([00:25:03](#)):

Let's focus on the NRF two.

Dave Asprey ([00:25:05](#)):

Yeah, no claims for broccoli made by the scientists behind broccoli. This is a study that you guys didn't do. We're talking about a study of what NRF two did for autism, and there is no correlation implied that broccoli does anything for autism except as the host of the show I can say seems intriguing there. Did I cover all of your bases? Yeah,

David Robert ([00:25:26](#)):

I'm sweating.

Dave Asprey ([00:25:29](#)):

Alright, tell me about autism and NRF too.

John Gildea ([00:25:31](#)):

So the Hopkins study is, they used a particular version of autism that's really recalcitrant. So it's older autistic kids. So it's hard to get IRB approval to study very young kids. So they started a broccoli sprout extract experiment on these older autistic

Dave Asprey ([00:25:54](#)):

Like seven, eight older or 15,

John Gildea ([00:25:56](#)):

10 to 22 something 29

David Robert ([00:25:58](#)):

Is the oldest.

Dave Asprey ([00:25:59](#)):

Wow.

John Gildea ([00:25:59](#)):

And so they gave him this broccoli sprout extract for eight weeks and 12 weeks. 12 weeks was it? Yeah. And it was something like 70% reduction in a whole host of measurable. Whoa.

David Robert ([00:26:16](#)):

Yeah. They basically did two different autistic scale scores, so written scores or written tests that they could score. And there was as high as 70, but the average was a 30% improvement basically.

Dave Asprey ([00:26:30](#)):

That's insane. I have a couple employees with adult autistic kids and I did not reverse mine mostly until I was about 35. And people are saying, Hey, you can't reverse it. Whatever guys, get your detox pathways working, fix your mitochondria, fix the lining on your nerves by changing your cell membranes out and then retrain your hearing, your vision and the way you move and a bunch of other stuff. And magically you can recover at almost any time as long as the original insult that caused it. And it's not just one. Cause there's a whole bunch of things that cause neuro immunity and cause cellular dysfunction. So whether it's metals or molds or flame retardants or whatever else, you remove the insult, fix the system, retrain the system. But if just by getting the toxins out, and I've seen this lots of times, you detox a kid and then two weeks later they're much better. This is fascinating. The only thing I know of that does all three pathways at once, I mean I take a handful of supplements every day for detox, but this is cool.

David Robert ([00:27:32](#)):

And one of the things that it's good to mention with that paper is once they stopped the broccoli sprout beverage, they returned to baseline. So yeah, it was pretty interesting. But along the lines of, and it's really related to the conversation, a lot of the reactive oxygen species in the mitochondria get dealt with by NRF two, which helps the mitochondria. And so it helps NRF two helps keep the mitochondria in that balance.

Dave Asprey ([00:28:15](#)):

So then they're doing their own job of making their own built-in antioxidants. You're inspiring me to take it. I've been using Elite for a long time and I've probably been out for the last six months. And when we're done with the show, I'll walk you guys through my supplements ruin and it looks like a pharmacy, but I take about 150 supplements a day and every now and then I'll run out of something and I won't put it in the Reorder Me Now box and then it falls off the spreadsheet. And for about six months, I've not been taking BRCA Leap, but I've taken it consistently for like four years.

John Gildea ([00:28:49](#)):

You might be in a category that matches a paper and it was that in mice they took NRF two for a relatively long time longer than normally you do in mice. And they found out that after a decent time, the NRF two stayed on for six months.

Dave Asprey ([00:29:08](#)):

Oh, interesting. And in

John Gildea ([00:29:09](#)):

A mouse that's a lot longer than six months in humans.

David Robert ([00:29:11](#)):

And even if you don't take it that long, if you take one serving, it'll keep NF two on for 72 hours.

Dave Asprey ([00:29:20](#)):

Wow. So that's a long period of time. So should I eat this packet? Yeah,

David Robert ([00:29:23](#)):

We encourage you to keep the DEC packet in the bottle

Dave Asprey ([00:29:26](#)):

Just a can. Alright, but I'm out of water you guys. Where's that bottle of water? Mads? We grabbing some more water? I am actually feeling inspired to take some, and by the way guys, if you're feeling

inspired to take some too, I've got a code for you, Mara Labs MA [rra-labs.com/dave](http://rra-labs.com/dave), they'll give you up to 28% off. And here's what I want you to know a hundred day no questions asked guarantee. So you can try it. You save money and if you don't feel anything after a month, you can just send, I know you send 'em the empty bottle or just say you didn't like it, whatever. Tell us. There you go. So they believe in what they're doing, which is cool. And like I said, I've been taking this for years before I met you guys because doing the research on NF two is good. Should I just take 10 of them? Yeah, here we go. So how many do I have here? 1, 2, 3, 4, 5, 6, 7, 8, 9, 10. I guess you're right.

David Robert ([00:30:22](#)):

So early on we were noticing a difference in our inflammatory, in our inflammation. I play guitar, I'm not great at it, but I enjoy it and I'd stopped playing and started playing again and it could only play for a couple minutes. Once we got the broccoli and the capsule took it and pretty quickly that instead of being able to play three minutes, I could play as long as I wanted. And so we're like internally we were wondering how quickly does this work? And so John created a study looking at IL six and urine, so interleukin six. And so two capsules reduced IL six 30% in 24 hours.

Dave Asprey ([00:31:08](#)):

So during this last three or four years of public policy insanity, which shall not be named for algorithmic things.

David Robert ([00:31:17](#)):

Thank you.

Dave Asprey ([00:31:18](#)):

I did write a long blog post listing the compounds that reduce IL six because it turns out this inflammatory cytokine, which I've had issues with for years because of toxic mold, almost any infection is going to raise IL six, which causes systemic inflammation. And if you suppress IL six or what's known as a cytokine storm, then you have less symptoms of whatever current thing is in the air. God, this is great. I feel like I'm in the land of double plus good doublespeak. And by the way, if you're under 30, the school stopped having you read the book that is from, which is 1984. And if you haven't read that, download it. You'll like it. Alright. So I've successfully said things without saying them possibly in a way that can fool our AI overlords. Do you think I did a good enough job? I think so, please. All right, good deal. So anyway, suppressing IL six is a preeminent way of being resilient, not getting sick or having less symptoms when you do get sick and living longer. In my experience of longevity. Do you guys agree with that? Yeah, it's amazing. It's the middle of everything, 30% suppression of one of the most important cytokines from a couple capsules of sulforaphane that's stabilized.

David Robert ([00:32:30](#)):

And that was a internal study and it was done with friends and family. So take it for what as you weigh.

Dave Asprey ([00:32:38](#)):

Yeah. And

John Gildea ([00:32:39](#)):

What's interesting is when we do podcasts, talking about the big movers is we do reactive oxygen species. So it turns on a whole bunch of genes that take care of reactive oxygen species and nitrogen species and then turning on the especially phase two and three detox pathways. And the third is blocking NRF NF kappa B. And so it does all through of those really well and there's thousands of papers on it.

Dave Asprey ([00:33:06](#)):

Wow. So you guys have heard me talk about hydrogen water for years, and one of the reasons hydrogen water is interesting is it blocks, which is the nitrogen species you talked about. I've had issues with this for years because there's three kinds of nitric oxide in the body. There's the endothelial. That's good. That's why you take stuff like N 1 0 1 to increase the stuff that helps your blood vessels. And then there's the neural, which is good for your brain and is hard to induce. And then there's iNOS or inducible noss, which goes to peroxynitrite and is bad for you. So if your pathways are broken or you don't have the ability to quench those free radicals because your cells are working, then you tend to get migraines and you get all sorts of cellular dysfunction and it's one of the more pernicious and mean of the pro oxidants. And you're saying that sulforaphane quenches per oxy nitrate?

John Gildea ([00:33:57](#)):

Yeah, so that's part of phase two detoxification and it's actually pretty strongly induced by sulforaphane. Wow,

Dave Asprey ([00:34:07](#)):

I did not know that part.

John Gildea ([00:34:07](#)):

Yeah, and NF kappa B is classically other supplements are known for it, but remember sulforaphane is really bioavailable, so it might get to places where some of the other supplements might not get to.

Dave Asprey ([00:34:23](#)):

And sulforaphane is both water and fast soluble like MCT oil is. That's right. Okay. And most compounds, they either love water or they hate water. And the fact this does both is really helpful. Some of the reasons MCT is such a powerful compound for driving other things through the gut. Is there any reason I should take this with MCT oil?

John Gildea ([00:34:42](#)):

Wow, that's super interesting. So I think that a beautiful, if I were to try and step into biohacking world would be, since sulforaphane lowers your glucose levels, you're going to get into ketosis faster. Oh,

Dave Asprey ([00:35:03](#)):

Interesting.

John Gildea ([00:35:04](#)):

And then maybe add some of your C eight. It's been shown to do great things and it would for sure be synergistically activated.

Dave Asprey ([00:35:14](#)):

Okay. Now I've spent six months of my life in one week segments with electrodes glued to my head learning advanced meditations. One of my companies called 40 Years of Zen does that for executives. So I have these weird systems mostly I didn't know there was anything below my neck that mattered until I was 30. So I had to just relearn all this weird stuff. I'm feeling like a noticeable shift in energy that I am actually a little bit surprised by. It gets kind of spreading out. Is this placebo? I mean it seems pretty fast. The capsule should have opened by now.

John Gildea ([00:35:45](#)):



Yeah. There's a lot of people that are nootropic people that love the brain buzz.

Dave Asprey ([00:35:51](#)):

It feels like neurotropic E.

David Robert ([00:35:53](#)):

Yeah. I mean that's one of the benefits

Dave Asprey ([00:35:56](#)):

I kind of liking this

David Robert ([00:35:57](#)):

Sulur fame is the brain drive nootropic factor BDNF. Oh man,

Dave Asprey ([00:36:03](#)):

You ruin my joke. I was going to say, so I hear you guys are into BDSM

John Gildea ([00:36:07](#)):

And then was like, what?

Dave Asprey ([00:36:08](#)):

And then I was, oh, I mean BDNF. Anyway, sorry. Thanks. Were ruining my joke man. Sorry.

([00:36:14](#)):

So BDNF, my book called Headstrong New York Times monthly science bestseller about here's all the stuff you can do for your brain and it's like half mitochondrial function and half BDNF and nerve growth factor induction. Just do those two things. And you have a young brain again, and I did not have any idea that bro elites would upregulate BDNF because normally it's a good extract of lion's mane, by the way. I've never seen one in coffee. They're using an extract of lion's mane that doesn't do anything. I've been disappointed for years till I found a heat and alcohol extract and all that. And then there's a bunch of

other things like fasting and whatever. So compare what broccoli does for BD NF with bd NF focused supplements. Is this like a strong effect or a weak effect?

David Robert ([00:37:00](#)):

John has a answer to that, but one of the ways we know, so early on I was doing customer service for the, I was doing everything

Dave Asprey ([00:37:10](#)):

As entrepreneurs do. Yeah,

David Robert ([00:37:11](#)):

I'd get a customer, I want my money back, it's not working. And so I'd be like, sure, let me just ask one question. Have you had vivid drapes? And they're like, no way. No way. That's this. And I was like, yes. So that's the BD and F, that's how

Dave Asprey ([00:37:28](#)):

You tell so few people know that. So you can tell whether your lion's mane is garbage or not in that if you take it and you don't have vivid dreams, it probably didn't work because I had literally given up on lion's mane. I used to put it in coffee. I tried all these different forms until I tried a form in tincture before bed that worked. And most of the time it's just like the mycelium, but they don't give you the parts that are effective.

David Robert ([00:37:53](#)):

And I will say it does work, but not everybody either has the dreams or remembers the dreams. And so about 25% of the people and will say, yeah, we have vit

Dave Asprey ([00:38:06](#)):

Traits. And interestingly, most psychedelics and my new book has a lot of info on psychedelics and it it'll be out next year. Most psychedelics and in particular ketamine induce large changes in BD NF. So we've started using ketamine at my neuroscience clinic at 40 years of Zen as an optional add-on to increase neuroplasticity during deep brain training. And there's no reason that I shouldn't be adding broccoli into my stack for people. So people who come, guys, we're going to give you a big stack to take before you get there so that you're properly lubricated in the brain. We'll say, okay, this is a more broad spectrum

than I realized, which is kind of cool. I've been taking it for a while because I knew about the longevity effects, but all three phases of detox plus IL six for inflammation plus per oxy nitrite, plus inducing neuroplasticity. That's kind of cool. Let's talk microbiome. I've been a huge fan of microbiome for years. I've been an advisor and investor in Biome has been measuring that. What do you guys see Sulforaphane does for gut bacteria?

John Gildea ([00:39:10](#)):

I don't know where to start because it's kind of a big world that we play in there. But to start off with, I think maybe it's helpful to know that we were part of the startup for what's Restore. So gut supplement that closes tight junctions.

Dave Asprey ([00:39:32](#)):

Oh, the one was Zach Bush? Yes. Oh yeah, Zach's been on the show. He is just been a friend for years. Okay. Yeah, I like that stuff. John Bed Restore. Oh no kidding. I use humic and Fulvic Endangered Coffee. It's in there a different form than in Restore. But Restore is a really, really cool product.

John Gildea ([00:39:48](#)):

So every cell type I've looked at so far, it tightens tight junctions. And so we know that the pathway to Titan tight junctions is NRF two. The first thing to know is that the place where your microbiome resides is in a small cage and in that microbiome are some things that can be dangerous, most likely LPS. And so if they get out of that box, they can cause damage. And so because that's happening, people have leaky gut and because they have dysbiosis, you have LPS leaking all the time. And so we like to start there because as soon as you tighten tight junctions, your microbiome remodels and it remodels pretty fast,

Dave Asprey ([00:40:34](#)):

That's a new perspective for me. Fixing the loose junctions in the gut causes changes in the bacteria. It's not changing in the bacteria that cause the tight junction. What about things like zonulin? I just had an episode where we talked about that. Does zonulin go down on sulforaphane?

John Gildea ([00:40:52](#)):

We haven't measured that directly, so we don't know that answer. But it does tighten tight junctions and in many cell types, you can do any form of N-R-F-T-O induction will tighten tight junctions. They're

basically, there's whole review articles that talk about all the things that are able to tighten tight junctions. Every one of 'em that does it does it through NRF two.

Dave Asprey ([00:41:18](#)):

I found a study out there that showed that if they use sulforaphane on old versus young mice, it gave the old mice, young mice, bacteria levels. And listeners might remember, I've talked about this. You can predict age by looking at the number of species of bacteria in the gut. I quadrupled my number of species by using prebiotics when I was writing superhuman. And it's one of those many markers of aging you could measure, but you're showing that just sulforaphane without any other changes is giving you a bigger diversity or a bigger volume of species.

John Gildea ([00:41:53](#)):

So all we know is that, and actually David has done a lot of work in this area personally, where you can change your diet and how fast your microbiome changes. It's about

Dave Asprey ([00:42:04](#)):

Three days, right?

John Gildea ([00:42:05](#)):

Yeah. It's fast.

David Robert ([00:42:07](#)):

You use me and my kids.

Dave Asprey ([00:42:08](#)):

Oh yeah. The best skinny pigs of all are family. My kids have been victims of testing for a long time.

John Gildea ([00:42:13](#)):

So I think that whole business of whether you're able to make butyrate in your bio microbiome is going to then go backwards and affect your enterocytes and your neuroendocrine cells there. And so all of those, there's multiple layers there and they're all talking to each other. But I think that the really great part about that is if you just tighten the tight junctions, some of the inflammation that's getting sensed by your gut associated lymphoid tissue is calmed down and then the microbiome without the inflammation there changes pretty dramatically. And then you start getting these feedback and forth, the enterocytes start feeding or making better mucus layer, better separation from the microbiome itself. The microbiome starts because of the change in its composition. It starts eating different food. So when you are introducing the foods that will change your microbiome, your indigestible fibers and your phyto estrogen, I mean not the phytonutrients in general will be started to acted it on by the microbiome. And so that snowball effects starts and it starts pretty fast.

David Robert ([00:43:36](#)):

And then on the opposite, the opposite direction, you could think how does a old mouse skit old microbiome? It's the opposite, right? The tight junctions get loose. There's LPS, there's just unhealth in general. And the microbiome shift,

Dave Asprey ([00:43:55](#)):

This is fascinating. I mean I feel like broccoli extract, or in this case specifically sulforaphane that's stabilized, it almost feels like an old supplement for longevity in my world because I do all the weird stuff and I've been taking it for a long time, mostly because I just knew some of the things about NRF too just for longevity. But the stuff about autistic kids and BD and F and all three phases of detox, this hits a lot of the stuff in my longevity book and my cognitive function book in a way I didn't know until this interview and I'm actually really intrigued. So you've inspired me to make sure that I have this back in my stack and I'm unquestionably feeling those 10 capsules I just took, oh, well I didn't mention this ahead of time, but a couple days ago because we're doing ketamine assisted neurofeedback at 40 years of Zen, I've been working with our medical doctor on proper dosing.

([00:44:59](#)):

And so I tried a much heavier dose than we would use at the clinic ever. And my brain wasn't that happy this morning as a result of that. And I feel like all of that fog just lifted. So that's really cool. And like I said, ketamine's a neuroplasticity inducing agent. I do not use it every day. If someone's trying to get you to use ketamine for 30 days or something, that's bad news for many things. This is occasional use with doctors. You could do ceremonial work, whatever, but I'm not promoting party use of it. I think that's actually not a good drug for that. But just the little thing to talk about that. But the fact my brain works now in a different way is evidence enough for me that something's going on in there. The one thing we haven't talked about in my notes is autophagy, which is another fetish that I have. And listeners know that I'm all about autophagy and autophagy. Can you explain autophagy and what and how sulforaphane does to affect it?

John Gildea ([00:45:58](#)):

So most studies that are related to autophagy will often talk about a transcription factor that's made in your own genome that then talks to your mitochondria. And the master control transcription factor for that is called PGC one alpha. And so inducing PGC one alpha has to be a part of your mitochondrial maintenance. And there's so many different ways to do it. And the way I like to introduce this topic is I sit down with a lot of people that are sick and they've been to the doctor a million times and they just want a little bit of help. So a really good place to start with that is just a few supplements that are able to induce your energy production. So induction of PGC one Alpha is a great place to start and few little supplements there and then they find themselves moving a little bit more and then they're sleeping a little bit better, they're more likely to go to the gym. And so it's like a little inducer in that area.

Dave Asprey ([00:47:13](#)):

So sulforaphane raises PGC one alpha

John Gildea ([00:47:16](#)):

And it does, it hit indirect ways. So one possible pathway that you could think about it doing is one of the best inducers of NAD is butyrate hydroxy buty butyric acid. So raising NAD is known to induce PGC one alpha. Same fasting also is another pathway that feeds into NAD and PGC one alpha and autophagy. So we think of it as sulforaphane as a stress that's not a stress. And so your body's response to it is to increase the number of mitochondria. So that's induction. There's also fission where they'll move together and then there's elongation. And so there's been a number of studies showing sulforaphane effects on all three. And so you can get rid of under functioning mitochondria. That's a lot like a very high stressful exercise routine and it'll get rid of under-functioning or a

Dave Asprey ([00:48:32](#)):

Longer fast. We'll do that as well.

John Gildea ([00:48:33](#)):

Yeah, longer. And we think of it that way as if you can't do a four day fast, maybe try a one day fast and tyl farhan, and then we think that those two are working together to make it a more effective fast. And so there's many papers showing autophagy induction and that is a component of how it works.

Dave Asprey ([00:48:58](#)):

Got it. PGC one alpha is something I wrote about in Superhuman. And guys, if you haven't read that, it's a preeminent longevity book and it tells you exactly why there are proven ways to extend lifespan, even though there is some doctors out there hitting the pavement right now saying it's not possible to extend

human life, ignoring the fact that our lifespan extended by 6.5 years already in the last 30 years. So I think we're doing it and you have to be maybe a little bit traumatized to be blind to that. So whatever's going on there, I don't know, but I firmly believe based on evidence, more than a thousand studies that this is possible and there's only 600 billion being invested in longevity this year. Maybe some of that's going to work. And NRF two is one of those pathways because it's what happens when you exercise.

[\(00:49:43\)](#):

So my two favorite NRF two inducers are longevity drugs. One is called GW 501516 or cardine. And this is exercise in a pill. It's a performance enhancing drug that's banned. Of course, all the stuff that's good is banned by sporting bodies. So that's how you know it works, right? For longevity, they want athletes to get old to make space for new ones apparently, I dunno, but 40-year-old athletes should be on testosterone for god's sake. Anyway, I digress. PGC one alpha, you want to raise it. This drug does. It also causes you to grow new mitochondria, which is kind of good, like 30% more. And of course it's a research grade thing, but why not? There's also this other thing that mimics exercise that is a longevity drug. And I'm going to piss you guys off. Are you ready? Pharmaceutical nicotine. I saw the flinch. So here's the kicker.

[\(00:50:39\)](#):

Tobacco's not good for longevity, we all know that. But one to five milligrams, very low dose. A cigarette has 20 milligrams, very low dose pharmaceutically extracted raises PGC on alpha, and people who smoke don't get Alzheimer's or Parkinson's, very, very low, but they get cancer and cardiovascular disease, you take those out by getting rid of the tobacco and you just have this pure drug. It turns out it's a potent nootropic and it's an exercise mimetic. And if you ever go down to South America, you wonder how these people are so thin. Well, they smoke like Geminis, which is bad for you. So I've been recommending overage 41 to five milligrams of pharmaceutical nicotine apart from smoking. The effects on PGC one alpha and on cognitive function and nicotinic acid receptors are actually really interesting and probably beneficial, especially at the one to two. But it's all because PGC one alpha. And so there you go. What do you think? Am I crazy? I

John Gildea [\(00:51:36\)](#):

Had no idea that that was true, but I can put two papers together that I know of that I can see how that happens. It's important. Yeah. I used it as a control and experiment one time to induce prostaglandin E two. Oh wow. And so does BOHB and so does PQQ.

Dave Asprey [\(00:51:57\)](#):

Yep. That's one of the longstanding supplements I've recommended. In fact, the first PQQ on the market, I used to make a specialized form when I ran Bulletproof. That was stable in stomach acid of PQQ.

John Gildea [\(00:52:07\)](#):

Cool. So is that the hack is nicotine, PQQ. And if

Dave Asprey ([00:52:11](#)):

You want to launch, yeah, that's a great stack right there. And if to save money on PQQ, take a little baking soda with it because stomach acid causes it to precipitate. It doesn't do anything. So if you have an alkaline environment in the stomach, you'll absorb PQQ and then take a little spray or a little sachet without the bad sweeteners and have a shot of espresso and oh my God, you'll write a novel or maybe another New York Times best seller I could or go on stage. And it's not just me saying this, I found a guy, I call him Dr. Nicotine if memory serves, it's been a couple hundred episodes. Andrew Newcomb, I think from Vanderbilt, he's been publishing since 1986, reliable studies on Alzheimer's and nicotine. But everyone says, oh, tobacco nicotine, same thing. They're not the same. And it's all about the dose.

([00:52:58](#)):

So I do that as a part of my longevity practice. I'll use a quarter half of a patch I probably have one on right now unless it fell off. Let's see, it's either patch right there. Yeah, so there's my nicotine for the day. Part of that is I don't want to get Alzheimer's. My grandmother passed it 101 and she had Alzheimer's in the last few years. It doesn't sound fun rather not. So being proactive, but now I've got my sulforaphane, I'm going to keep doing my nicotine and I'll do this weird thing called exercise with AI and thank you. Upgrade labs and have enough time left over to go have fun, right? That's the plan. By the way, I'm doing another five of these.

John Gildea ([00:53:32](#)):

I feel like you unlocked a little bit like I have a bunch of papers swimming in my head. Yeah, there's some connection with nicotine and reduction in some cancers, right? Oh

Dave Asprey ([00:53:40](#)):

Yeah. Surprisingly, there's also an increase in some at higher doses. And most of those papers though is because they were smoking. Anytime you burn stuff, I don't care if it's pot or plastic, you shouldn't breathe it or meat. It turns out the number two source of indoor air pollution is you didn't have a good vent hood on your stove. I have air quality monitors that turn up my air filters throughout the house and as soon as I cook and anything, even with the hood on that sounds like a jet taking off. They all turn yellow and start cleaning the air. That means I'm breathing secondhand smoke from bacon or something. So I usually cook outdoors. I don't want my lungs to affect to be affected by that. So no burning. And then I also make sure that I do a little bit of nicotine because mitochondrial enhancement is good for stopping cancer.

([00:54:30](#)):

That's why PQQ, that's why MCT oil, almost any of the things that upregulate mitochondria, downregulate cancer. So yeah, check out Andrew Newcombe from Vanderbilt. Interesting guy. You were both a little bit different as research scientists. When I talked to Dr. Nicotine, I'm like, so what's your favorite form? You talked to me about typing, speed, all these benefits. Are you on the patch? Do you use a spray? And he goes, I've never tried it. I wouldn't want to bias myself. And I'm like, how can you study something without trying it? So you obviously are willing to use sulforaphane. How much broccoli do you each take per day? You have unlimited supplies of this, right? I just took 15 of these. How would you do?



John Gildea ([00:55:13](#)):

I do two professionals in the morning, which is 15. 15.

Dave Asprey ([00:55:17](#)):

Is that professionals versus plus? What's the difference? It has it four. Okay, so you're basically doing three of the consumer grades and

John Gildea ([00:55:25](#)):

Then one at

Dave Asprey ([00:55:25](#)):

Night. So it's four per day and 90 more. I'll

David Robert ([00:55:29](#)):

Do eight at night and probably eight

Dave Asprey ([00:55:35](#)):

In the morning. All right. We can be friends. David.

John Gildea ([00:55:37](#)):

He's our fire packer.

Dave Asprey ([00:55:39](#)):

I'm just kidding. There is this thing that we all have, it's a cognitive bias because our brains are trying to save electricity that says if something good, more, better. And it turns out it's not true for almost anything. In the case of sulforaphane, is there an upper limit where you get less returns or where it turns dark?

John Gildea ([00:55:57](#)):

I don't know that answer. They've done quite a few studies with much higher doses, like 600 microm, which is, that's a lot. Maybe 130 milligrams. So that would be 20 pills or something like that. I

Dave Asprey ([00:56:14](#)):

Just did 15. So we'll see what happens to me.

John Gildea ([00:56:16](#)):

And the only side effect they see in those studies is gastrointestinal upset.

David Robert ([00:56:23](#)):

Maybe the first cells that see the sulforaphane are seeing a lot at once. So the plus in the broccoli pluses, we add the cousin molecule from a watercress called P-E-I-T-C. And part of the reason for that is John is seeing there's an upper limit in the blood. Even if you take 15, if you take

Dave Asprey ([00:56:48](#)):

10, yeah, you max out. Okay, you

David Robert ([00:56:49](#)):

Max out. And so from a NRF two standpoint, even the other stabilized urin product on the market, he's done a test on buccal swabs and it doesn't induce an nerve too. And we think that the synergy, the P-E-I-T-C plus, the sulforaphane plus the other molecules that are from the seed that are five other isothiocyanates in the seed, all of those work in synergy to induce a RF

Dave Asprey ([00:57:19](#)):

Two. So I found a study out there 30% more in RF two because you have the water costs extract in there as well. So you're really potently pushing that. And it kind of reminds me of what's going on in the beat industry as a supplement guy. So many people, I have beets, they don't do anything to raise nitric oxide. It just doesn't. So I had the lead scientist for 25 years of that stuff and he tells you exactly why inactivated eats out there, just don't do stuff. And he has \$60,000 gas gramm graft says, well, let's see if it induces it. And what do you know? There are ways to do it. N 1 0 1 is the brand that tested highest. Of course it's his brand, but I've seen him do the tests. And so just because it has beets doesn't mean it does anything. Just because it has broccoli doesn't mean it does anything.

[\(00:58:09\)](#):

It's about whether it was stabilized or whether it, you're not using broccoli, whether you magically have the right gut bacteria. And it turns out you probably don't. Just like people who've listened for a long time, there's something called ULI A that's made by healthy gut bacteria from pomegranate. So if you eat five pounds of pomegranates and you're one of the few people with the gut bacteria and you don't mind all that sugar and oxalate, then you would make your oleate. Or you could take the supplement and with broccoli, well, five pounds of broccoli with some radish or raw broccoli along the side. And there you go. Now you got some NRF, or you do the pills and then you eat your broccoli or you don't. So we'll say, I'm definitely a fan. I've taken this stuff for years and I think it's potent and useful. And guys, if you're saying this might worth it for you, Mara, [MAR a-labs.com/dave](http://MARa-labs.com/dave) to learn more. Up to 28% there you go, that's actually a good savings. And the fact you have a hundred day guarantee is good. So guys, you're saying, well, Dave just told me I should take another supplement. Here's the deal. Just to be really upfront about it. You have X number of pills you're willing to swallow every day. You have X number of minutes. You're willing to spend doing stuff to live longer, and you have X number of effort or pain you're willing to do. So if I told you, put yourself in the face 10 times a day and you'll live forever, no one's going to do it because it sucks, right? So there's an amount of suffering, amount of time, and an amount of money that you're willing to spend, and it's my job to teach you this tool for longevity. I don't care if it's a laser or a supplement.

[\(00:59:53\)](#):

It has this effect biologically, and its your job to say, all right, is detox a focus of my strategy? If so, then broccoli. Yes. But if you're saying neuroplasticity is my thing, well, it turns out broccoli might be a good thing. So the more avenues that a supplement can address for you, then the more it's worth it financially and swallowing the pills, but only your goals. I don't know your goals. So you have to make that decision for yourself, and you could do what I do, which is take everything I talk about. But I'm a professional longevity guy. I've been doing this for 25 years, and frankly, I'm willing to swallow 150 pills a day. So there's that. Anyway, Mara, [MARA dash labs slash Dave](http://MARA-dash-labs.com/dave), and you save some money. I tell you that if you take 10 of 'em, you're going to feel it because I'm really feeling it. Guys, thanks for making the trip out to Austin.

David Robert:

Dave, thanks so much for having us.

John Gildea:

Yeah, it's a pleasure.