



Why Sulforaphane Is Incredible For Brain Health & Gut Health

With Dr. John Gildea and Dr. Martin Katz

David Roberts:

Hey, everybody. It's David Roberts and you're listening to the Mara Labs podcast. And today, I have Dr. Martin Katz and Dr. John Gildea with me, and we're going to be discussing sulforaphane and brain health. It's a topic we've talked about before, but perhaps not on a podcast like this. And so, we want to just share some of the research, some of the benefits of sulforaphane in the brain, and as we're doing the pre-show discussion, we may even delve into sulforaphane and the gut, because of the gut-brain connection. So, let's dive in, and Martin, why don't you share some of what you were sharing just a moment ago, on just what you're seeing in your clinic?

Dr. Martin Katz:

Yeah. Hi, everybody. It's good to be here. A little bit of a break with the weather and COVID and every thing else. So, it's really great to be back. But yeah, I mean, in clinic, it's just overwhelming the amount of anxiety, depression, that we're seeing in the clinic with all that's going on, the consternation that's out there. And so, I talk to people a lot about what they can do to be healthy and certainly exercise, certainly eat better, make sure they're getting enough sleep, and certainly try and help control their stress by doing numerous things.

Dr. Martin Katz:

So, scouring the literature, I was delighted to see that sulforaphane has a very positive effect on two things I talk a fair amount about in my clinic. And as we know, sulforaphane has a way of getting across the blood-brain barrier. And with that, it has a way of increasing reduced glutathione in the brain, which will have very positive impacts. When you look at certain people with depression or anxiety, parts of their brain are inflamed and fairly dark when we do these advanced scannings on them. And so, if you can balance that inflammation, balance that oxidative stress out, with something as powerful as sulforaphane and its effect on reduced glutathione, you will see an effect.

Dr. Martin Katz:

And indeed, these studies have shown a very positive effect on mental health. Whether you're talking about things like schizophrenia, whether you're talking about autism, depression, there is a positive effect and support for these patients in the studies. And so, that in my clinic, is an incredible benefit.

Dr. Martin Katz:

One of the reasons I tell people to exercise all the time is the effect it has on BDNF, brain-derived neurotrophic factor. And when you look at its effect on neuroplasticity and what it can do to help shift people's thought processes and help support them in evaluating a new way of thinking and a new approach to life, rather than the, "I can't's." Or, "I won't's." Or, "Life's very difficult." And help support them moving in a more positive direction. I can't begin to even applause the amount or the need for BDNF. And so, anything we can do to support increased BDNF in the brain is going to be, in my clinical practice, something I applaud. And so obviously again, encouraging people to exercise. And now fortunately, we have this stabilized sulforaphane and so I can encourage people maybe to use that, to help encourage those levels of BDNF and get people going in a positive direction.

David Roberts:

Yeah. People often ask when they write in, "How do we know that broccoli's working? The sulforaphane in broccoli is actually doing what you say it's doing?" And so, I'll often write back and throw out, asking

the question, "Hey, have you noticed any difference in your dreaming?" And it's not everybody, but I'd say 20, 25% of folks come back and they're like, "No way. I've been wondering why I've been having the most vivid dreams." And so, that's what we think is the BDNF stimulation. John, any other thoughts from your angle, from the research on sulforaphane in the brain?

Dr. John Gildea:

The ones that jump out at me are, what was already mentioned is the connection to inflammation. So, inflammation connected to literally every brain-related dysfunction you can think of. Whether there's astrocytes or glial cells that they tend to be inflamed in a lot of these difficulties that are presented. And so, I would say that the beneficial pathway that is often counteracting a large number of these pathologies are the stimulation of autophagy. So, there's a pretty clear connection between the misfolded protein, [Taoisms], as they're called. A whole bunch of different parts of the brain often have different protein aggregation problems.

Dr. John Gildea:

There's three or four different ones that tend to have aggregation issues. And that whole process of a misfolded protein acting like a prion, is that that protein can then misfold other proteins. So, whenever you can counteract that, you're counteracting a long-term pathology that's involved. And also, because autophagy and mitophagy are usually related, you're having better energy production so that you can run all the normal functions that a cell needs to run to perform in peak activity. So, that's also a connection to the exercise too. So, that aspect, I think, is an unlimited source of information about brain health, that is beneficial in sulforaphane.

Dr. John Gildea:

From blocking of PANDAS, there's studies that show these model systems in mice that have PANDAS, it's an autism-like dysfunction that sulforaphane is shown to reverse that in model systems. The whole way to models of Parkinson's disease in mouse models. So, we have to specifically say they're in mouse models, because the clinical studies in humans haven't been done, but very clear evidence of blocking brain pathology through those pathways, between inflammation and stimulation of autophagy.

David Roberts:

Yeah. And just to throw out our disclaimer. So, basically, as a supplement company, none of our supplements can be used or advertised as treating, or diagnosing, or curing any disease state. And so, that is a law. So, we just want to say that, the body of literature showing sulforaphane working in brain health, like John said, that specific case was on mice, not humans. And we will let you all, as the listeners, we'll have some links in the bio or in the show notes that you can click over and read for yourself. But yeah, obviously, sulforaphane's important for brain. Have you guys noticed the neurotrophic effect, as more clear thought processes having taken sulforaphane?

Dr. Martin Katz:

Yeah. I mean, I would say, I've noticed to some degree and certainly I've had patients who've noticed that their brains seem to be working better. For some reason, I'm seeing an inordinate amount of fatigue and brain fog, certainly as it possibly relates to tick-borne illnesses, COVID, other viruses. And once people get back on track and certainly that could involve taking supplements and possibly sulforaphane, that they do notice that there's an improvement.

Dr. Martin Katz:

And it just makes sense, as John has pointed out, I mean, certain things are going to get in the way of a system working well. If you have misfolded proteins, inflammation, oxidative stress, and you go back to basics, you're eating better, you're getting adequate sleep, you are possibly taking a supplement that can help with these things, you are going to notice a benefit. I see it in my athletes, in athletes who are not eating well, over-train, take an antibiotic and mess up their gut microbiome. Oftentimes, going back to the basic, helping reestablish the things that we know work, they start feeling better and can get back to the level they were previously at.

David Roberts:

So, now that you mentioned the microbiome and gut health, and antibiotics, so let's talk about sulforaphane and the gut-brain connection.

Dr. Martin Katz:

And the thing that I talk about in my practice all the time is the understanding that this gut is your second brain, but there's a lot more to that. And again just, if we want to just focus on fatigue and the anxiety that causes, the depression that that causes, possibly it's vice versa, who knows what came first, chicken or egg type of thing. But if you look at the microbiome and the amazing amount of bacteria we should have in our gut, is way more than obviously the cells. And I'm hoping most people know that by now the amount of bacterial, fungal, viral cells that we have in our gut outnumber our cells in order of 10, possibly 100.

Dr. Martin Katz:

The thing that most people may not know is the variety of those bacteria, virus, fungi, possibly even parasites, that should be in the gut, nowadays is minute compared to what it used to be. And so, we have these bad players in the gut that create increasing inflammation in the gut and therefore, in the system. Most people hopefully also know that 70 to 80% of our immune system is in the gut. And so, if you're sparking it there, the immune system doesn't just sit in the gut and just create havoc there. We are a system, we have blood flow and that blood flows everywhere, including the brain. And so, it's imperative to have a healthy gut microbiome to ensure a healthy system.

Dr. Martin Katz:

We're also understanding that these mitochondria have a very similar structure and communication network to bacteria. And so, the mitochondria in our cells seem to be communicating to the mitochondria in our gut. And a healthy gut microbiome creates butyrates, that create these things called small chain fatty acids, again, from the foods we eat, which again is why we are encouraging people to eat a strong plant diet. Doesn't have to be just plants, but certainly ensuring that there's a variety of plants, to ensure that the gut is healthy and you're getting these small chain fatty acids, with communication to these mitochondria to keep them well.

Dr. Martin Katz:

Because if you wonder what a mitochondria is, it is your power plant. It is what's powering you through all the processes that require energy. Just sitting through a day, you're burning 1,200 to possibly 1,600 calories, just sitting there thinking and having a heartbeat and breathing. And so, all these processes require energy. If you want to now get up and exercise and create a process where you're getting rid of

misfolded proteins through autophagy, or cells that are unhealthy and you're creating apoptosis or just improved communication through the system, and realize the benefits of exercise, you're going to be burning more calories. You want your mitochondria to be healthy and doing what they're supposed to be doing. So again, there's incredible mounting data on the importance of a healthy microbiome.

David Roberts:

And John, how have you seen in the literature that, that healthy microbiome impacts cognition?

Dr. John Gildea:

Yeah. So, my-

David Roberts:

And how does sulforaphane interact in all that?

Dr. John Gildea:

Yeah. I mean, it's obviously complex. So, we're talking about a complex system and you wouldn't think that a single compound could affect something that's that complex, but with a few iterations looking into pathways that are known to be involved in the process of dysbiosis, it's pretty clear that ... So, if you look in the toxin world, so there's a lot of toxins like mercury or cadmium that affect gut motility. So, how fast the food is moved along your gut. So, that would be one connection.

Dr. John Gildea:

Sulforaphane itself is pretty antimicrobial. So, if it's rapidly absorbed, it would tend to reduce the number of microbes in your stomach and duodenum, early parts of your small intestine, before it's absorbed. So, those are direct things. The mercury, cadmium effects are pretty well known to be components of your brain that are places in your brain where you don't have a blood-brain barrier, where it's sensing your bloodstream. And so, those mercury and cadmium effects are affecting those cells that regulate gut motility. So, there's a lot of places where you can see, oh, there's inflammation, oh, there's reactive oxygen species. And there's also detox that need to be dealt with, to affect your microbiome. So, everything from decreasing the amount of toxins that you're eating can have a big effect there.

Dr. John Gildea:

And then detoxifying things that do end up getting into your system can have big effects. And then, we've found personally, that in experiments where we're looking directly at tight junctions, sulforaphane has big effects on tightening tight junctions. So, the actual lining of the gut would tend to keep those toxins from getting into your system in the first place. So, that along with the things that Martin said were, the bacteria are making ... They're making these short chain fatty acids that are actually feeding the gut lining. They're making amino acids. Supplying vitamins as well. So, it's a whole big concerted effort. And to think that you just do one thing, can push needles in the right direction in a lot of different ways, is why people tend to say that, "I don't exactly know why, I just feel better."

David Roberts:

Yeah, yeah. And then we, in one of our blogs and I think maybe a podcast, certainly we have talked about it internally, the paper looking at mice and gut bacteria composition when they take

sulforaphane. And so, basically, old mice having an "old microbiome." So, basically, deficient, not ideal. And young mice having a better, more diverse microbiome. And then, with sulforaphane, those same old mice transition to a microbiome composition that is very similar to the younger mice. So, what that means practically, could be as simple as what you were saying, John, just feel better.

Dr. Martin Katz:

Yeah. And I mean, if you look at sulforaphane and its multitude of effects, whether it's on BDNF, on HDAC, and acetylase. If you're looking at its ability to methylate, if you're looking at its ability on heme oxygenase, just makes sense that we're seeing that same benefit in studies.

David Roberts:

Well, gentlemen, thank you for joining us today and talking about sulforaphane in the brain and the gut. And so, we will be back next week with another installment of the Mara Labs podcast. Thanks again for joining us.

Dr. Martin Katz:

Thanks for taking care of your body.

Dr. John Gildea:

Bye-bye.