Episode 402: What BrocElite Does That Others Don't: Nrf-2

With Dr. Martin Katz, Dr. John Gildea and David Roberts

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David Roberts:

Hey everybody, it's David Roberts and you're listening to the Mara Labs podcast. And today I'm Dr. John Gildea, Dr. Martin Katz, and we're going to be discussing Sulforaphane, specifically activation of Nrf2. And John's done some research looking at the two stabilized Sulforaphane products on the market, ours, which is BrocElite, and then also Broc, which is formally, or I guess not formally, but it's also known as Prostaphane out of France. And so, since Nrf2 is sort of mostly why we take Sulforaphane and it's the magic inducing in Nrf2 is obviously important. And so John, can you just share some of what you learned when you've been looking at the two products?

John Gildea:

Yeah, so when I was developing the product, one of the important components is to make sure that it's bioavailable and reaches a concentration in the tissue so you know that it's reaching a bioavailable tissue bioavailability. And so I came up with a strategy for looking at the actual Nrf2, the protein transcription factor. So, the normal state is for it to be degraded in the cytoplasm of a cell. And then if you get Sulforaphane to that cell at an appropriate concentration, then it stabilizes. So, at first the amount of it goes up, but then it also has to be nuclear translocated, so it has to go into the nucleus and then sit down on genes to turn them on. Another part of the pathway is for it to get exported back out of the nucleus and again degraded. So, it's a pretty complex protein in terms of how you get it activated. So, I wanted to look at it directly. And so when we were developing product, I was testing buccal cells, so just cells in your mouth.

So, it would have to go in your mouth, get absorbed back into the bloodstream and then back to the cells that are in your mouth and they're accessible. So, you can just scrape cells off your cheek of your mouth and measure Nrf2. And so, I was able to measure the Nrf2 induction with just taking a normal dose of BrocElite. And I actually, I can measure a pretty wide range of Nrf2 induction. So, when I did the study, I just took those same cells without having taken the supplement and put them into short-term culture with pure Sulforaphane in it to see what was the equivalent amount directly put on the cells that I took from BrocElite. And so, when I took cells and put them right into culture, the amount that I was measuring at the buccal cell was equivalent to five micromole of pure Sulforaphane. So, it's a little bit higher than what's been seen in the literature. And so I think that's the reason why when I took the competition, I wasn't able to measure the Sulforaphane induction and it's just a dose dose thing.

David Roberts:

But the Broc product, the competition actually has a higher dose of Sulforaphane than BrocElite. I think it's 20 milligrams per serving versus ours is 10, maybe-

Martin Katz:

Depends on whether you're doing pro or just regular seven and a half or-

David Roberts:

We're talking about, yeah, the regular, most people take the regular, so that seems like it's counterintuitive.

John Gildea:

Yeah. And the reason behind it is unknown to me. I just know that when I do it, I don't see induction at my buccal cells. So, I haven't tried to figure out why that doesn't do that. But to put it into perspective,

there's only been a couple of papers where they publish a paper looking for Nrf2 induction and they did it in nasal swabs. So, instead of the buccal, they did up in the nasopharyngeal space and looked at Nrf2 induction and they did 200 grams of broccoli sprout extract and didn't see induction. So, it's not too surprising.

David Roberts:

Grams or milligrams?

John Gildea:

So, if you just take broccoli sprouts and grind it up and dry it meaning that-

David Roberts:

Oh yeah, the grams of the sprouts. And what would that be translating into milligrams of Sulforaphane.

John Gildea:

So it's not Sulforaphane, it's Glucoraphanin. But that amount of Glucoraphanin has been shown to produce bioavailable Sulforaphane in circulation. But it's again in the one to two micromole range, which is the typical that for most studies they find that amount in blood. And so, I don't know exactly why in our particular mixture we have Sulforaphane and at least six other isothiocyanates in our product. And I think it just has to be some sort of synergy between the individual molecules where I think the other product is either just the precursor that produces just Sulforaphane or the compound that's in the product because it's a isolated product, it's just Sulforaphane.

David Roberts:

So, having the other isotonic is important, you think?

John Gildea:

Yeah, that's my guess at why I'm seeing a difference. It's just-

David Roberts:

Well, there's also I think one or two, at least one paper, I think two papers looking at synergy with PEITC. We can include that in the show notes, that paper. But you want to talk some about what that paper shows?

John Gildea:

Yeah. So, when you're measuring a reaction to something, the typical way two chemicals interact, if they both interact on the same pathway, say, say you're looking at NF-κB inhibition, if say curcumin inhibits NF-κB and Sulforaphane inhibits NF-κB, if you take the two together, it'll be additive. So, it's like it'll go down 1% with each of them. And if you take the two of them together, it'll be 2%. But we find between Sulforaphane and PEITC is synergistic, so I actually titrated it, so that I don't see a response for either of them. This is in my hands.

Martin Katz:

So, diluting it way down, yeah.

John Gildea:

Until you don't see an effect, and then you dilute the other one down until you don't see an effect. But if you put them together, you see an effect and it appears to be fivefold synergistic between those two compounds.

David Roberts:

And so, you put the two concentrations where there are no effect individually, and then you see effect.

John Gildea:

Yeah, that's the strictest version of a synergy experiment. The other paper where they were looking at it, they did see a small effect, a significant small effect when they put them together, instead of it being double the reaction, it was more than double. So, they use the statistical method to prove that it's more than additive.

Martin Katz:

That goes back to that understanding that nature knows best. And the other thing I think that's amazing about our products, and John, the ones that you've created, is not only do you look for bioavailability, which is incredibly important and some cellular response. So, bioavailability, bioaccumulation, and biologic response. But you also are using natural products. There's nothing unnatural about our products, all food based. So, that's pretty awesome as well.

John Gildea:

Yeah, we had run into it really early on when we were confused by, if you just take absolutely pure Sulforaphane where it's 99.9% pure, and you put it on cells that are vulnerable to it. So, one of the cell types that I study is proximal tubal cells-

Martin Katz:

Kidney cells.

John Gildea:

Yeah, kidney cells, they're actually, it'll kill a certain number of those cells with just pure Sulforaphane. But when we put our product on, that has a plethora of compounds because it's basically a natural compound. And then all of the things that are in the seed and sprouts end up in the final product, it didn't kill even at 10 times the concentration. And so, there's certainly something going on there in terms of protection as well as activation.

Martin Katz:

And new use of buccal cells is very normal. I mean, just about every genomic study uses cells from the mouth, inside of the mouth.

David Roberts:

And John, you said you didn't know why, but any hypotheses as far as why when you used Sulforaphane or the Broc product, it didn't use or show Nrf2 induction? Any hypotheses that you're working on?

John Gildea:

The only way that I understand it is that there aren't any studies showing Nrf2 induction in a tissue. There are a number of them that show with broccoli sprout extract. They look at PBMCs, the white blood cells that are in blood, so they're the most exposed. So, it's one less barrier that you get to. So, for every barrier that you have to go through, it's essentially a reduction in the amount of that compound. Yeah. So, when I'm looking at a tissue, an end organ tissue, I think you need some threshold of the amount of sulforaphane in blood to get to the actual tissue. And I think because it's just Sulforaphane, even though it's a little bit higher concentration than broccoli, it's still at the end organ system. It's not as high a concentration.

Martin Katz:

Interesting.

John Gildea:

Functional concentration.

David Roberts:

So, if you take Rhonda Patrick's big on 60 milligrams of Sulforaphane as the magic number, that's her magic number. You think that would induce?

John Gildea:

I haven't tested that, but because there's so many studies that use just plain old broccoli sprouts ground up, I think those have all the compounds in there. And I would say yes, it does.

David Roberts:

Okay, great.

Martin Katz:

And again, if you're using sprouts, make sure you know what you're getting as far as precursor molecule goes. We've tested so many different seeds, and lo and behold, there's almost no Glucoraphanin and myrosinase. Well, certainly I think we're testing Glucoraphanin in those cells.

David Roberts:

Well, thank you gentlemen. This has been a helpful conversation and we will be back next week with another episode of the Mara Labs Podcast. Thanks so much for your time.