Mark: Welcome to the Health Edge, Translating the Science of Self-Care. Great to be with you. I am Mark Pettus, and I'm with my friend and colleague, as always, Dr. John Bagnulo. John, good morning, buddy. How are you doing?

Dr. John: Good morning, Mark. I'm doing well. How about you?

Mark: Doing really well. Getting into late January here, and looking forward to another turn of the month. It’s a busy time as always. It’s been an interesting winter here. We’ve got very little snow here in the Berkshire which is very, very unusual, but that’s okay. It’s certainly made getting around a little bit easier.

Dr. John: Yeah, there you go. I’m looking forward to this morning’s talk on supplements. I think it’s something a lot of people are interested in. For me, as we’ve talked about with things like saturated fat and red meat, certainly I’m at a very different place both personally and professionally with my recommendation, my use of supplements, than I was 20 years ago.

Mark: My thinking has evolved a lot around supplementation as well, John. I know we’ve had a few questions from our last podcast, John, requesting a little more detail. We talked about the metabolic tune-ups and this phenomenon, probably a very common phenomenon where the majority of people, certainly in America where it’s been tested will have deficiencies of various micronutrients that are known to be major players in all aspects of human biology and human biochemistry, John.

 We looked at this in the context of conditions in one’s lives that require amounts of micronutrients that might far exceed those levels below which you have a deficiency state. We examined several of those factors including our genetic predisposition, the SNPs, these single nucleotide polymorphisms that we know can alter many biochemical reactions, and this was Bruce Ames’ work, that affect these enzymes in ways that require much higher concentrations than one would typically get from just meeting an RDA requirement. As well as so many other conditions, John, that we talked about often from inflammation, to leaky gut, to small intestinal bacterial overgrowth, to sleep deprivation, and unrelenting stress, all of these things play a significant burden particularly when people confront them in a chronic state for much higher amounts of micronutrients.

 That was the context that we set for thinking differently about this. I think you and I, we both agreed, John, that even if you have a really good and balanced nutritional program, your unique needs might be such that certain micronutrients are required in supplement form or in higher concentration. That’s what we’ll spend a little bit of time on today.

Dr. John: Yeah, that’s excellent, Mark. I don’t think there’s a human living in the modern world that doesn’t have their own unique sets of genetic and environmental risk factors. As you mentioned, we all carry different SNPs. Some people have, for instance, the MTHFR gene which is the methylenetetrahydrofolate reductase gene. Some of our listeners are probably familiar with that because they’ve been found to have high, high levels of homocysteine. When they dug a little deeper, they saw that they just really were an individual that needs more folate than the next. It’s actually quite common. I think it’s something in one in eight or one in nine people that carry that particular gene. That would be an example of a genetic risk factor.

 Then, Mark, as you and I have talked in the past, you can’t find a person that hasn’t been exposed to something like a particular environmental set of hazards. Maybe dietarily, they had … This would certainly be the case with myself. I had a history of high, high polyunsaturated fat intake which I look at as a very unique risk factor for a lot of mitochondrial issues down the road. I lived on various polyunsaturated fats, and a lot of fructose-rich fruits and dried fruit when I was in my teens, and 20s, and really active. Those things take their toll on the mitochondria. I’ve been doing what I can to remediate that now. Also, as you and I have talked, heavy metals. Certainly, you and I can, I hope, talk about this in the future. I think it’d be great.

Mark: Absolutely.

Dr. John: Yeah. You’ve got those two different patterns, genetic and environmental. Then, there are some others as well but there isn’t a person that rarely doesn’t have some Achilles heel, right?

Mark: Yeah, no question, John. I thought we could go through a list of supplements recognizing that there’s never one size that fits all here, nor is there at any one point in time a particular regimen that may serve someone optimally at a second point in time. As conditions change, and I find it in my own life, John, there is a bit of an experimentation here. I will try certain things for a while, see how I feel, maybe look at certain biomarkers whether it’s C-reactive protein as a marker for inflammation, or you and I have talked about the HOMA as a marker for insulin resistance. I will sometimes look at those markers and see to the extent that I can how I am feeling, how are they looking?

 One of the other conditions in my life, am I more stressed at one point in time and another, and then try to tailor some of these around that. I think the mitochondrial aspect of this, John, is one slice of a broader pie, if you will. You and I, in our last podcast, talked about the cocktail, the mitochondrial cocktail. It’s a good example, John, of what might be several micronutrients which have synergistic effect which is really how nature packages all that we talked about in plant-based foods which is so different than a traditional pharmacologic approach where it’s one molecule, and you’re impacting usually in a very significant way one particular enzymatic or biochemical pathway.

 It’s the one drug for one disease. There are so many examples of that from proton-pump inhibitors for reflux, to let’s say ACE inhibitors, angiotensin-converting enzyme inhibitors for blood pressure, beta blockers. These are categories of medicines that do one thing in a very powerful way, and there’s no question there can be some value for that, but what we’re talking about are usually combinations of micronutrients in smaller doses that have much more subtle, what we would call, hormetic effects on human biology.

 I think what emerges, even though there’s still not a lot of research in this area, John, is that these protocols can be very, very effective, and they tend to be, I think, much less toxic. They always, perhaps, wants to be careful about combinations and interactions, particularly if they are taking prescription medications, but for the most part, this is a very different pharmacologic approach than we typically see applied in our traditional models of care.

Dr. John: Yeah, and just to build on what you mentioned earlier, there isn’t a one-size-fits-all approach with this. I think it’s really important to reiterate that what we’re discussing this morning is not something that every listener should go out and try to apply every supplement in whatever dosages we talk about because we’re really talking about what we use maybe on our own personal lives and what we think can be helpful for a lot of people.

 The second thing which, again, is really important to reiterate is the importance of experimentation. I think when you introduce a supplement or multiple supplements, I think you have to look at, at least, two different aspects of your life, and to see over the course of one week, two weeks, or however long you feel is necessary to evaluate this. You have to look at something that could change and could give you a little insight as to whether or not you are being tuned up in essence. I try to use how I perform an exercise whether it’s the time of my runs or how I feel on the weight room in terms of my strength. I also try to look at the quality of my sleep.

 I think, personally, those are the things I use without making life what we call paralysis by analysis. I think it’s good. I think it’s really good just to try to evaluate a couple of different aspects of life to see whether those supplements are giving you an advantage as opposed to without. Those are just really important because I know, and you certainly hear this all the time, Mark, is people want a list of supplements to take. For you and I not knowing anything about an individual, their particular risk factors and ways of life, it’s going to be hard to really tailor-match that.

Mark: I would see some of what we’re sharing today, John, those are great points, as just things that people can look into on their own. There’s also, as we have often eluded to, a wide variety of quality. These are uncharted waters to a large extent. It does help to do, as always in self-care, a bit of homework, and if you have a provider that’s really savvy in this who is familiar with some of the brands that have more rigorous quality control, recognizing that all of these things fall outside of FDA oversight. Some supplements we know may not have the exact ingredients or the amount that are on their label. They may have other contaminants that can range from heavy metals to other contaminants.

 I do, as a footnote, John, and we now have some show notes for our podcast. I know often we have a lot of information in these, and people can’t always take it all in. They can go back to the show notes, but there are a few databases that I think can help any consumer look at the quality. Consumerlab.com is one that I know we both have used. Consumer Lab, there is a prescription for that, and those manufacturers that produce supplements do contract with Consumer Lab. There’s some exchange of money there to allow Consumer Lab to look at their product but I think it’s an objective way of at least testing, and measuring, and having a sense of quality. Then, the Natural Standards Database is another way of looking at some of this stuff, John.

 I don’t know if there are other tools that you use but when you practice this for a while as we have, you do get to know many of the vendors, and you interact with so many integrative and functional medicine providers, you get a sense of where the quality is, and tend to steer people toward them, but there could be a wide range of quality and cost. This can get expensive as well. All of those things come into play when people begin to think about where a supplement or supplements might help them in their journey.

Dr. John: Yeah, there are radical differences in the quality among brands or producers. I find it really disheartening when someone contacts me and say that they just read in Consumer Review. Consumer Review is not the Consumer Lab that you mentioned. Consumer Review looks at washing machines, and cars, and things like that. The science is so far ahead of Consumer Review in terms of the way they analyze supplements. They’re just looking to see if what is in there is in there, but they’re not at all concerned with the clinical research which has shown one particular isomer of a vitamin or nutrient to be so much more bioactive and effective than another.

 I think that’s the level of sophistication that you need to look at supplements with is if you’re taking vitamin E, for instance, and it’s just synthetic, DL tocopherol, it might have in the actual supplement what it says it does, but in terms of it being bioactive or actually helping with what it is you’re taking it for, it’s a completely different creature than if you were taking mixed tocotrienols which, again, most people are not going to be familiar with, but there’s a level of sophistication when it comes to evaluating supplements for particular conditions or for prophylactive reasons, Mark.

 There’s a level of sophistication. It’s just really not out there with the exception of … I do like the Natural Standards evaluation method. I think they’re excellent, but it’s something where if you see a supplement for $4 as opposed to $40, a lot of times, some of that would be marked up depending on where it’s being sold, if it’s more of a boutique type of place, but there is a distinct quality difference typically between your very, very low cost supplements.

 It’s not going to be important with something like magnesium. As long as you’re getting magnesium, as we’ve talked about, citrate, glycinate, aspartate, and it’s not magnesium oxide, but if you start getting into things where one is $4 and the other is $40, and you look at the back, and you see that, for instance, the folate that’s found in the product is made up of folinic acid and MTHF, which is methyltetrahydrofolate, that’s far, far better than just taking a synthetic folic acid.

 Just two examples, but I would want our listeners to understand that once you buy with an incredible discounted rate, it’s not often the quality of what you find for, unfortunately, significantly higher prices. There is a big quality difference between low-end and higher-end supplements. Sometimes, it’s poor trade as though they’re all the same from places like Consumer Reviews.

Mark: Those are great examples as well, John. This is why it can be so helpful to have a savvy clinical partner who can help you separate not just the quality of the product but what’s in the product. Your example of the mixed tocopherol and tocotrienols, these families of vitamin E compounds, as really very different bioactive family than just what might be a typical vitamin E alpha tocopherol. You also give the example, John, of the folinic acid, the reduced form of folate or the methylated form of folate which can be much more bioactive. There are some nuances here. I think those are good examples of what, on the surface, might appear to be equal products that when you look a little bit more deeply, you get very different quality and very different bioactivity.

 We’ll just quickly go through, John. There’s no particular pattern here, but I thought looking at the mitochondrial cocktail, there are some things that I frequently recommend. Mitochondria, as we’ve touched on, John, are central to all aspects of human health and human physiology. I do think more specifically of mitochondria when I am working with someone who is maybe dealing with chronic fatigue, or fibromyalgia, or any neurologic issue whether it’d be neuropathy, or Parkinson’s, or depression, or MS, insulin resistance, there are so many health issues where the mitochondria, we now understand, play a central role.

 The cocktails that I often look at, John, would include … Again, we’ll have this in our show notes for the listeners. I would start with CoQ10. Here, you and I have made the distinction, John, between ubiquinol which is a more bioactive form of CoQ10 which is essentially an antioxidant that is concentrated in mitochondria. It helps manage some of that oxidative stress as a very important supplement. Those just vary so much when you look at what has been published.

 I may start with a form of CoQ10 that’s ubiquinol. A particular product, and I have no vested interest in any of these products, but I’ve been looking at a product from New Zealand. It’s called MitoQ, M-I-T-O-Q. It’s a novel compound that has some good research behind it. Superb penetration. Dosing there can be anywhere from 200 milligrams twice a day if somebody has Parkinson’s perhaps, or MS, or dealing with some cognitive issues. I might go even higher just in terms of what we’re starting to see in some of the neurologic literature. That may be as high as 400 twice a day. Much higher doses than what you would typically hear and see in terms of what has been published.

 I always use ubiquinol in people on statins. The data is very, I think, conflicted with statins and reducing the risk of myopathy, John. There actually is some randomized controlled data out there from the Mayo Clinic and other places. In terms of the muscle issues, I am not sure that it’s panned out as protective as people have thought which is not to say that ubiquinol doesn’t play a huge role in somebody on a statin recognizing that their CoQ10 levels will drop considerably, and the myopathy which may be one manifestation of that says nothing about what’s happening biologically or physiologically throughout the body.

 When a colleague of mine reminds me that the evidence isn’t great for CoQ10 along with statins, my response is that, “That may be true for preventing myopathy or even reducing the magnitude of the myopathy, but that is not to say that it may not be having many other physiologic benefits.” That’s a product that I’m looking at right now. Ubiquinol is available in many different brands, as you know, John.

 The other thing that I look at as part of the cocktail is we talked about acetyl-L-carnitine. This helps support fatty acid metabolism in the mitochondria. There, I might use 500 to 1000 milligrams twice a day. Alpha-lipoic acid. These are the three that are included in lot of Bruce Ames’ work with animals and some human studies. Alpha-lipoic acid is the queen of antioxidants being both water and lipid soluble and it helps recycle vitamin C, vitamin E. It helps recycle many other antioxidants in our system. There, I might use 500 milligrams to 1000 milligrams twice a day. There are two forms of it, the L-form, the R-form. We call these isomers. The R-form might be a bit more bioactive.

 Those are three off the top. I will often, again, John, consider as part of that cocktail, things like creatinine which we touched on. I like a proprietary alkalinized blend called Kre-Alkayn, K-R-E-A-L-K-A-L-Y-N, in that form. N-Acetyl Cysteine which has been out there for a while as a very effective antioxidant. It’s very helpful in the liver and biotransformation. Having a lot of cysteine sulfur molecules with it can be very helpful as part of a mitochondrial cocktail. It’s often used for detox.

 Then, I guess, the last of that particular cocktail would be glutathione in a lipophilic form. Glutathione is otherwise not well absorbed and can be destroyed by stomach acid, but there are some good lipophilic products out there. Glutathione, as we often refer to John, is the master antioxidant and glutathione production will be up-regulated in any individual who has a high burden of oxidative stress whether it’s from a toxin, whether it’s from an infection, whether it’s from a chronic inflammatory process like SIBO, or dysbiosis, or leaky gut. Most of us can anticipate some functional need for extra glutathione at various times in our lives.

 I often will put all those things together around maybe B-complex and I’ll see how people will do. Often, I’ll do these cocktails, John, for a minimum of three months and the person may monitor, if it’s chronic fatigue, their energy levels, their pain levels, their mood levels, their cognition, how their memory, how their attention is doing. People with neuropathy can gauge their pain and how they’re feeling with that. A lot of what I will follow will be subjective, symptomatic aspects for what people are dealing with, and if there are biomarkers.

 We can talk a little bit about biomarkers, John, because it could be hard to find good biomarkers for a lot of what we’re talking about. There is some testing out there. Occasionally, I may get a urinary organic acid. Again, any provider familiar with functional medicine will know the appropriate labs, but the organic acids are a test that I find helpful. I don’t always do a lot of testing. I work with a lot of people who don’t have a lot of resources but one that I would think about very high in the last would be the urinary organic acids which gives us a metabolic snapshot or profile at that point in time for an individual which looks at many of these micronutrients. I find, John, that that can be a helpful roadmap in addition to just the symptoms and review of symptoms that a person is having as a way to gauge response to these cocktails.

Dr. John: I think if that resource is available to an individual, that level of testing, I think, it can be really insightful. I know that, as you mentioned, it can’t cover every particular pathway or nutrient but something as basic as looking at the amount of oxidized DNA base pairs, it’s a simple urine test. I used this in my PhD work back in the year 2000. We looked at, in women, how much of their DNA, little fragments were oxidized in their urine. We looked at how adding very antioxidant-rich fruits and vegetables, how it influenced that. Certainly, the same has been done, Mark, with many of those mitochondrial protective nutrients that you just went through. I think I can help people maybe pinpoint areas that need more help than others.

 That list that you just shared with our listeners, I think, is right on. I think there’s a few others that might … It could be a really long list. At some point, people have to start to prioritize. I think, as we talked about, zinc is something that a lot of people are at a very low level physiologically. They may have enough. Their body has performed this triage where they have enough to maybe keep their T-cells active. Maybe, or maybe not, maybe enough to produce testosterone, but when you start to get at the mitochondrial level, in animal studies, it can be very different between what is at that tissue level within the mitochondria and then what’s being used for other physiological processes.

 I usually recommend 15 milligrams of zinc for most of the people that I work with. I think it’s good for people to take it at bedtime with magnesium. Magnesium aspartate and zinc are integral parts of a very, very popular supplement called ZMA. It’s zinc and magnesium aspartate. It’s taken at very modest doses by athletes all over the world for improved muscle recovery. Some people say that it improves sleep, but I think zinc, magnesium, and selenium are all minerals and trace minerals that can really help support our mitochondria even if we don’t have neurological impairment, or we don’t have some unique risk factor. Those are really good choices as protective nutrients. I think most people do well with 200 micrograms of selenium. I don’t think people really need to go much beyond that unless they got some type of severe deficiency, but I like zinc, magnesium, and selenium when it comes to minerals and trace minerals.

 The one antioxidant, and this is really controversial because I know a lot of the individuals try to steer clear of antioxidants because of how it can tip that whole redox pathway in the wrong direction, but I think there’s enough research now, Mark. I’d love to hear your thoughts on this around Resveratrol. I recommend Resveratrol now for a lot of the people that I talk with because it just has been shown to be very restorative to damage mitochondria, to help with sleep. I think in the animal studies and in a few handful of human studies, the outcomes are very encouraging.

 I recommend Resveratrol on top of the acetyl L-carnitine. I am a huge fan of alkalized creatine. I’ve used that now for several years, and I noticed a big difference in how I feel especially whether it’s involved in some type of exercise or stretch training. I think too many of us, certainly I’m going to put myself in this category, chewed meat for so long. If you don’t eat meat or you’re not eating copious quantities of sardines, it can be really difficult to keep your body’s creatine stores at the level that you’d want them to be for both muscular function, as well as for mitochondrial protection.

 I like that list that you went through a lot. I think, again, it could go on and on. Your fat soluble vitamins are certainly important. I recommend that people consider taking MSM, 1500 milligrams, mixed with a little bit of water, once or twice a day. I think everybody can benefit from getting some more sulfur. If you take a look at the research on dietary sulfur levels and a population’s risk for a long list of conditions, sulfur is very protective. It goes along the same lines as the NAC that you mentioned, the N-Acetyl Cysteine. These are all really good things to consider experimenting, as we mentioned, for mitochondrial health. Even if someone doesn’t have neurological impairment, a lot of this have very little downside.

Mark: Absolutely, John. Those are really great thoughts. We always come back to this place of individualization. There are a lot of different supplements out there and some really interesting molecules. Again, how people to tailor this to meet their individual needs will vary so much, John, but Resveratrol, I think, is an incredibly interesting molecule. For people who want to dive into this, David Sinclair’s work at Harvard really opened the door to a couple of classes of genes called the SIRT genes, S-I-R-T. I won’t get too geeky here, John, but Resveratrol, one of the first molecules known to activate these SIRT genes.

 In animal study, it had been activated in the same way that one sees with caloric restriction. Caloric restriction is probably the only intervention, John, that’s ever been proven to prolong life. A lot of this work has been in animals and primates. Resveratrol can activate the SIRT family in much the same way, and Sinclair’s work, and I know a lot of this is is now going through phase three clinical trials, and diabetes, and insulin resistance. I think Resveratrol is a really interesting compound. The bioavailabilty I know can be a challenge depending on the brand.

 A lot of Sinclair’s work led to a patent or a company, and again we have no vested interest in any of these companies that produces a proprietary brand which I have use called Longevinex. It’s a lipophilic form of Resveratrol. It gets better bioabsorption, and I think it’s a really interesting molecule. If people have resources and it can afford combinations of these things, I think they’re definitely worth looking into, John.

Dr. John: Yeah, because that can be a pricey one. If you’re getting a good Resveratrol, and as you just mentioned, when you start to see lipo on all forms of things, the price is junked considerably, but you might be looking at $50 here for a two-month supply of a high quality Resveratrol, and that’s a significant investment. I’d certainly take that over a month of Direct TV if you really weigh the pros and cons. A lot of people don’t necessarily prioritize things that way.

 Not to make light of that, I think that these things do take sometimes a certain place in the person’s budget and in their list of priorities, but I think that out of all the molecules, whether you talk about the antioxidants like Resveratrol, vitamin C, the anthocyanins found in dark blue pigmented fruits and vegetables, what you just mentioned in terms of the SIRT genes, and also Resveratrol has been shown to be an mTOR inhibitor. It’s been shown to help elevate levels AMPK, the activated protein kinase.

 These are all things, as you mentioned, Mark, we can only really see. It’s either a caloric restriction or a ketogenic diet. I think the potential for Resveratrol to help people who hopefully are also experimenting with things like intermittent fasting and a ketogenic diet. I think that there’s an enormous amount of upside for the potential for a molecule like Resveratrol to play a therapeutic role in helping a person mitigate some of the damage that’s caused by modern lifestyle.

Mark: Definitely. These are areas of research that I know we both pay very close attention to, John. Again, isn’t it interesting, as we’ve we talked about many times, how Resveratrol, a plant-based phytonutrient that you’ll find in the skin of a grape, or a peanut, and these plants put most of their defense on the surface of what they produce. Isn’t it interesting that any human or mammal that consumes that molecule will have activation at the level of a few key regulatory genes, several metabolic pathways.

 It’s just fascinating when you step back, and existentially say, “Well, man. Why is it?” Why is it that polyphenol and so many of the compounds that you touched on, John, when consumed by another species have their biology regulated in such a profound and diverse way, and generally in a health promoting way. It just makes you ponder just how powerful our relationships are with the plant world.

 I think you get the sense, John, that we’re just touching the surface on the array, the vast array of phytonutrients that can continue to modulate human health in some way. Greatest challenge for the consumer being that these are not things generally that pharmaceutical companies are going to look at or study because often, they can’t patent down. I think that’s why one has to, on their own, look at some of this, and study it, and try it, and I think Resveratrol is a great example of that.

Dr. John: Those are good points, Mark. I want to add one thing that I know comes up time and time again with groups that you and I have taught or in terms of emails that we get is people say, “Why I can’t rely on that glass of Pinot Noir from my Resveratrol? Why can’t I rely on that can of sardines from my CoQ10?” or having four or five ounces of liver twice a week for the other nutrients that we gone through. I think that some individuals can do that. I would never say that a glass of Pinot Noir is going to offer across the board the levels of Resveratrol that people could acquire with modest dosing because Resveratrol is a function of so much of the grapes environment.

 If the Pinot Noir is not organically grown, if those grapes are sprayed with fungicide, then the grapes won’t produce Resveratrol. If the particular grape is not grown in a climate that has considerable moisture and dampness, the grape won’t produce the Resveratrol. It’s very difficult and nobody, no wine producer is testing all of their batches of wine for Resveratrol. There’s nothing going on like that right now in vineyard culture, but when it comes to the other foods such as sardines and liver, I think that can work for some people.

 I’m not here to and I know you’re not here to say that every human being on this planet needs to take something like CoQ10, but I think more and more of us fall into a category of at least moderate risk because of either some type of polypharmacy in our life whether it’s statins and other things that compromise mitochondrial health or we’ve got a particular risk because of exposure to an environmental pollutant, or contaminant, or deficiencies.

 I think there’s a way to get some of these nutrients from a consistently nutrient dense diet, but I don’t think that it’s often enough, Mark, on a therapeutic level. I think that can be preventative. I think that’s really the way we should all try to raise our children, the way we should try to eat from a young age on up, but I think if you don’t have any type of compromised physiology, then quite often, it requires dosages that are more significant than what you’re going to get in a typical serving of food.

 I just thought I’d add that because I know quite often we have the, “I want food to provide everything,” and I use to fall in that camp philosophically until I started looking at the research on the aging process, and how even under the best of conditions, humans, our physiology, our tissue levels of particular nutrients, we just haven’t evolved to live much beyond 35-40 years old. When you get beyond that, someone could say “You’re living on a biochemical level, you’re living on borrowed time,” and I think if you want to really maximize the quality of your life, the quality of your health, I think sometimes this metabolic tune up that we’re talking about, whether it’s on a mitochondrial level or with respect to maintaining DNA quality, sometimes, these require some tweaks, and that’s what we’re talking about.

Mark: That’s such a central point, John, that you make. Really pretty much the heart of, I think, self-care in a modern environment is that we are living longer and we’re also living longer in an environment that’s more, I hate to use the word, hostile but certainly more challenging than an environment has ever been for a modern homo sapiens. We really don’t know how optimally to support metabolic function to meet those unique demands to our species, but it’s clear that those demands are high. I think that’s such a great way to look at this, John.

 Much the same way that a person’s needs at one time in their life, if they’re not eating well and not moving effectively, all the things that we talked about may look very different once many of those conditions in their lives are more better and effectively managed. These are always evolving needs and propositions in our life. I think a lot of what we’re talking about appears to be relatively safe and minimally toxic which is, I think, always an important part of that analysis.

 In the last ten minutes or so, John, we’ve touched a lot on the mitochondrial piece and all that can help the mitochondria can help virtually anything in human biology. This can be extended to many potential health issues from insulin resistance, to cardiomyopathy, congestive heart failure, again, the cognitive. There aren’t many things that couldn’t potentially benefit from this, but as you look at what you’re currently taking, John, and I’ll reflect on what I’m currently taking that we didn’t capture in that common supplements that may come up in the context of either your day-to-day life or what you may commonly recommend to others that you’re consulting with, what didn’t we touch on that that you would be thinking about?

Dr. John: I think it’s really important for a lot of us to take a well-formulated B-complex. I don’t even like to use the word B-complex because there’s some B vitamins that I don’t recommend people take. I think some of our listeners might be surprised to hear that. I don’t recommend that people take niacin, even in small amounts. Niacin is just ubiquitous in a healthy diet as we recommend. I had some pretty interesting research on niacin promoting infections.

 I don’t like niacin but I do like folate in the right forms like we talked about. 50% of it from folinic acid and about 50% of it from methyltetrahydrofolate or MTHF. I like choline. I like vitamin B6. I take a product called Methyl Assist every day. I think it’s important for people to take vitamins A, D, and K together. I like a product called Synergy K. Again, I don’t have any relationships with the manufacturers of these products, but I found them to be, as you mentioned, the best there are out there that I’ve discovered in terms of their balance and the quality of their particular blends.

 I take vitamin A and I don’t take Vitamin D every day. We’ve touched upon this in the past. I’m now using a vitamin D lamp to generate. With just five minutes of exposure on a small portion of my body. I can generate several thousand IUs of D. I’m really trying to go in that direction because of the difference in sulfated vitamin D which we produce. I only take vitamin D when I travel, Mark, or just don’t have an opportunity to use the lamp, but I think A and D, if someone is going to take D, I think it’s important to take A and D together. Those two have a synergistic role. Vitamin K as well. I like a combination of B vitamins. I like the fat soluble vitamins.

 The other things that I think can really help a lot of people, and again It’s not going to be one size fits all, but I like to use particular herbs or supplements to deal with whether it’s inflammation, recovery from exercise, adaptogens which we’ve talked about. I’m a big fan of boswellia and curcumin which is, of course, from turmeric. Those can be found in a variety of different forms. Those would be some things that I would add to this list that I think could have major upside.

 When it comes to boswellia, and turmeric, and these herbs, for people who have a certain level of vigilance around taking things, the only downside to this, and I really scoured the research is that if you’re on a blood center, then maybe, but I think these are herbs, turmeric and boswellia, that have major upside with very little downside at all. It’s lot like Resveratrol. These are substances produced by plants that have just incredibly potent effects on mitochondrial health, improving it, particular biochemical pathways, slowing them down, especially if a person has been under high levels of stress or under enormous load in terms of dealing with free radicals, and some of the byproducts of an overactive sympathetic nervous system. Those would be some things I’d add.

Mark: Yeah, that’s beautiful, John. I think that would be a great topic for another podcast. I know you have a lot of interest in spices, herbs, botanicals, adaptogens, these really incredible complex arrays of plant-based molecules that alter the human biology in ways that can up-regulate, down-regulate. They have these unique properties, and I think that’s an awesome thing to bring up here, and one that I realized we could be spending a lot more time looking at in more detail. That’s fantastic.

 Currently, John, I also use a vitamin D lamp and I really like that. I think your point about getting light-derived vitamin D on the sulfated form of vitamin D, as we’ve touched on a prior podcast, in reference to Dr. Stephanie Sennef’s work is so intriguing and interesting. Again it applies that getting the source from the processes whereby nature has provided us the ways to get that source as opposed to taking an extracted supplement, it does probably confer some advantage from what we’re finding in the work that’s been done so far in this.

 There isn’t much I could add to what you touched on, John, with the exception of right now, I’m taking a probiotic. Probiotics are another one of those topics, John, that could easily be a full podcast. I don’t think anyone knows what an ideal probiotic would look like and certainly what might be ideal for one person might look at a little different to another, but I think the point of recognizing the diversity of the microbiome as central to all aspect of human health, and just off the top, a priori, starting from a place of assuming that most Americans probably don’t have a very diverse representation in their microbiome, unless they’ve just been living very well for a very long time, but this environment that we live in now makes it hard to maintain that.

 I think of probiotics, John, as inflammatory modulating interventions. The probiotic that I am using now is called Prescript Assist that’s got some soya-based organisms. I’ve used a lot of different brands. I like VSL3 which I think has some good quality controls. It’s a bit of the Rambo of probiotics. It’s been studied in people with inflammatory bowel disease, but it has very high amounts, hundred plus billion, and captures what we know to be some of the important bifidobacter and lactobacillus strands. Not all strands of these of these species of bugs are anti-inflammatory. They’ve done some of that research.

 I look at probiotics as a way of modulating inflammation more than I do receding your microbiome. Anyone who is dealing with an inflammatory problem which most of the people that I deal with and in my own life, it may be an issue of some back pain or maybe just dealing with cognitive stresses in my day-to-day work, my background of insulin resistance, and so many other things that I just find probiotics to be very helpful. As an adjunct, of course, John, to all that we always talk about, about getting a lot more plant-based fiber and prebiotics which actually, I think, more than anything will allow that ecosystem to diversify.

 The other thing that I have experimented with, John, is lithium, very low doses of lithium. Low doses meaning 5 milligrams, lithium orotate. These are inexpensive. My interest in lithium has been largely around just cognition, mood. The winter months for me can sometimes be a bit of a downer. This winter, I am trying very low doses of lithium. I am intrigued. Lithium is a traced mineral, micronutrient. We all have circulating levels of lithium in our bodies at very low doses, and this is a fraction, tiny fraction, of what somebody is being treated, for example, for bipolar disease. Just to put that in perspective, somebody with bipolar being treated with lithium would be taking 1200 milligrams a day. This is a supplement that has 5 milligrams. I’ve had a pretty good winter. Who knows why but that is something I’m playing with.

Dr. John: It’s good, Mark. There’s some good research in lithium in heart disease. People who have better levels of lithium have a much lower risk of heart disease. I think that’s a really good addition.

Mark: Those are some of the things off the top, John. It’s all right. We’ve spent almost an hour looking at this. To some extent, perhaps, we’ve only even scratched the surface, John, but hopefully, we’ve given people a bit more of a focused starting point as they look at their regimens. Again, we’ll get the show notes to this on our website, the healthedgepodcast.com. I’ll provide some links as well, John, for Consumer Lab and for the Natural Standard Database. Again, no substitute for finding a provider that understands this stuff and can work with you. Any parting thoughts, John, before we [crosstalk 00:51:20]?

Dr. John: No. Other than that, I hope that people have heard about one or two things that might make sense for them to experiment with again. To go slow, try to stop and slow down enough in your life that you can listen to your body, and get a better sense for what’s working and what’s not, but that’s really, I think, the most important step for people. The first step is to slow down a little bit because if you take 30 of these things and you continue with the same pace, you might not be able to listen to your body. Hopefully, we’ve given something out there for everybody.

Mark: Absolutely. John, it’s been a lot of fun as always.

Dr. John: Take care, buddy.

Mark: Great to connect and more to come real soon. You take care, bud.

Dr. John: You too.

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