The Influence of Your Gut Microbiome on Your Dietary Choices
A Special Interview With Georgi Dinkov
By Dr. Joseph Mercola

Dr. Joseph Mercola:

Welcome, everyone. Dr. Mercola, helping to take control of your health. And today we are joined by a favorite, certainly a favorite of mine, Georgi Dinkov. He's been gracious enough to dialogue with me and help me understand a lot of the great late Ray Peat's work. Now, Georgi, I've got a question for you. About 18 months ago, two events happened. Significant events that were really – Well, one event was sad, the other was world-changing. Do you have an idea? It was an interesting coincidence.

Georgi Dinkov:

Well, one of them was [that] Ray Peat passed away. I'm guessing that's one of them.

Dr. Joseph Mercola:

Yes, that's one. How about the other one? And it's in your field. That's a hint.

Georgi Dinkov:

Well, the one that I was going to mention is basically the war in Ukraine, but it's about a year now, so it's not 18 months. I guess something else happened.

Dr. Joseph Mercola:

Yeah, it's in your field. That's the hint.

Georgi Dinkov:

Something hacking-wise?

Dr. Joseph Mercola:

No, it was the introduction of ChatGPT.

Georgi Dinkov:

Oh, okay, okay. Yeah, the AI thing.

Dr. Joseph Mercola:

I was just looking at the date when Ray passed, and it was literally within a week of when ChatGPT was launched.

Georgi Dinkov:

Yeah, I guess it is a monumental change for a lot of people. I just haven't used it in my field yet, so I guess that's why I haven't considered-

Dr. Joseph Mercola:

Oh. That's a whole other discussion we should have, for sure, because the potential for that is beyond enormous. But that's a topic for another discussion. And it would be good to have you back, because many people aren't aware that you are an amazing programmer and coder. And you are employed, have several government contracts. That's your primary source of revenue. It's not doing podcasts.

Georgi Dinkov:

That's right. That's right.

Dr. Joseph Mercola:

You're a brilliant programmer. Brilliant. You brought-

Georgi Dinkov:

Thank you. I appreciate it.

Dr. Joseph Mercola:

-most everything you put your mind to. We've got a lot of things to talk [about], and I want to talk about some of your mouse research. But there are two topics I want to discuss first [that] I think you'll delight in. First of all, I want to extend my deep gratitude for your help in mentoring me in understanding and applying Ray's work. There's never been a body of work that I've encountered in medicine that took me longer to comprehend and understand and then improve it. It took me almost a full 18 months, because the breadth of his work is just enormous. The complexity, it's relatively simple, but there's a lot of details to it. And it's a lot of moving parts. And so, don't feel bad if you hear this information [and] you're confused, because it took me literally a year and a half to get it where I really fully understand it and grasp it. And then, there's still many pieces that don't make sense. Anyway-

Georgi Dinkov:

A great quote from Ray, he said, "Ideally the world should never make sense until the right knowledge and the right circumstances. Flip a switch and then it makes sense."

Dr. Joseph Mercola:

Yeah. What I'm really excited about, because I have not had an opportunity to discuss with you, but within the last month or so, maybe two months, I understood something that Ray didn't. And he's done most of the stuff but he missed this, and I'm not sure why, but he did. And I'm really excited to share this with you. And it was really one of the aspects of his approach that I had some concerns about, and that is this ostensible anomaly – And many people perverted, really changed this information to suit their own needs, but there's a belief that many people have that he advocated large amounts of sugar and that you could have sugar endlessly and you'd be fine. And that's not the case at all. Sugar itself is okay. If it's refined, it's more of a problem. But if you use it in increase it's definitely a problem.

The issue really boils down to the microbiome. And he didn't put a lot of emphasis on there. Certainly, he talked about endotoxin and such, but I don't think he had a full deep appreciation of the power of the microbiome. It may be the single most influence on health. Because, listen, they outnumber us a lot. Maybe trillions-

Georgi Dinkov:

10-to-1, or something.

Dr. Joseph Mercola:

10-to-1? 10-to-1, yeah. Well, that's just the microbes, I haven't even talked about bacteriophages, which is another 10-to-1, 100-to-1. It's probably more. And we have no concept of the influence of these bacteriophages, let alone to identify them. Anyway, just to simplify it, the contention was, and many people in [the] Peat community believe, that it is wise to avoid starch and have lots of fruit. Fruit would be the ultimate carbohydrate. And I believe that's true, and was Ray's experience. But it was only their experience because metabolism was trashed [in] the vast majority of the population.

I believe it's comparable to those who are metabolically inflexible, which at this point, the most current published data we have relates to NHANES (National Health and Nutrition Examination Survey) data published, I think, in 2023 was 2018 data. So, they're probably getting ready to publish the update to that, but still, 6 years old. 6 years old, and it was 93.1%. So that number now is probably 96% to 97% of the population is metabolically inflexible, and I contend is also mitochondrially dysfunctional or mitochondrially impaired. And if you don't have enough mitochondria, you can't create cellular energy, at least efficiently or in an abundance that it's required to do a really, really important function that I don't think Peat understood. I'm pretty confident he did not. And it's still pervasive in the community. What is that function? That function is [an] absolute requirement to get an optimal microbiome.

If you're not creating cellular energy, you're not going to have an optimal microbiome. It just doesn't work. So 97% of people are not creating enough cellular energy, so their microbiome is messed up. By definition, many of them are going to have problems with starch and vegetables, and all extensively really healthy things. When we were making enough energy, there weren't problems, they were health foods. Now, because we're impaired, they become problematic. And why are they problematic? Because there's basically two different types of bacteria in the gut. One of them is the beneficial bacteria, and the other are the pathogenic. Two sets. There's a lot

of substance, but if you break down the two camps, the beneficial bacteria – Now, they both are gram negatives, primarily gram negatives, but you can divide those into two other camps.

One would be obligate anaerobes. These are bacteria that just are destroyed with the molecule of oxygen. Those are the good guys. And then within the cell walls of the good guys, and this is not widely known, there's no lipopolysaccharide, there is no endotoxin. You can feed those guys until the cows come home and you'll just get healthy, because they make good things like short-chain fatty acids, deuteric acid, propionic acid, glucagon-like peptide, or glucagon itself. I think they create glucagon. The glucagon-like – no, GLP-1 is what they make. So, GLP-1. And then you've got the facultative anaerobes, the ones that tolerate oxygen. And I'm almost done and I'll let you comment on it. But what happens is if you're not making enough energy, it requires energy to exclude oxygen from the large intestine, and that's where 99% of your microbes in your gut are. They're in your large intestine. You have them in almost all the other places. But [if] they're in large numbers in the small intestine, then you have SIBO.

But they're supposed to be mostly in your large intestine. So when there's not enough cellular energy, oxygen's leaking in, you're killing the good guys. The primary one here is Akkermansia. It should be about 10% of the population of your bowel. And in many cases, I've been talking with some of the companies that do the measurement where they actually do this DNA analysis and they find out exactly what species are there, and Akkermansia was not even identified until 20 years ago. Yeah, because in ideal cases, it should comprise about 10% of your microbiome, 10%. And [in] one out of three people, these companies that measure it, they find it's not present. They can't detect it. It's not there. They're so messed up. I'm going to do some deep dives in this and really get the data. We're going to actually probably purchase some of this equipment and start doing testing on it too.

But the point here is that when you don't have enough cellular energy, the oxygen leaks in, you get these facultative anaerobes. These are the pathogenic bacteria and they have endotoxin in their cell walls. And that's the problem. And so when you feed starch and you have a preponderance of these pathogenic bacteria, you have problems. And you really don't have another solution. [For] many people, the only type of carb that they're going to tolerate well and not produce this endotoxin is the fruit juice. That's it, that's all they can tolerate. Anything else and they're going to have a problem, they will trigger diseases. I think the key here, and there's a number of different ways we can explore about how to improve mitochondrial energy, but ultimately, that's it. You've got to increase mitochondrial energy, and there are other things you can do to improve that. But once your gut microbiome is healthy, then you're in a different camp, then the starch becomes healthier. And [it] actually is, I think, much healthier than fruit. Because I think the Peat community has been disparaging [Dr.] Robert Lustig and [Dr.] Rick Johnson for their work on fructose.

But I think there's some truth into their work. I really do. I think there's some confusion, and it's not as bad as they portray it to be, and they don't really acknowledge that fruit can be healthy. But I think, ultimately, the fructose complicates the metabolism, and it's acceptable, but it's not ideal. And I think that maybe you should have some, because there's really – What fruit does have – Not so much for the fructose, [but] it has magnificent polyphenols. And a lot of the starches don't. The polyphenols in fruit are just through the roof, and those polyphenols are very

beneficial for the gut microflora, and they tend not to activate the pathogenic bacteria. They're relatively neutral, so you get some benefit there.

Anyway, that is what I've uncovered. And there are other people who've done it. One of my friends, Ashley Armstrong – and I reached this conclusion just recently and covered some literature, and I can send you a study that does this. But I'm wondering – That's the thesis. That's what I've – Not the thesis, but I think that the information that I've come to identify as the missing piece in Ray's work. He didn't get this, he didn't understand it. And this is the next level. And it's sad that he's not alive, that we can't discuss it with him, because I'm pretty confident he would agree with it.

Georgi Dinkov:

Yeah, I think so. And also, some things that weren't as predominant while he was alive is that recently the food industry started adding a lot of antibiotics to the food just as a preservative. There's something called, I think, nisin, and they're putting it into cheeses, any kind of cooked food you buy, even from supposedly healthy places like Whole Foods. So, we are ingesting a lot of actually industrial antibiotics on a regular basis if we're eating processed foods. So, those antibiotics, of course, they're going to mess up the microbiome. And it just so happens that the facultative anaerobes that you mentioned, they're opportunistic bacteria. And once the microbiome count declines, when you stop taking the antibiotic, the bacterial count of the pathogenic bacteria rises much more quickly. So if you're taking antibiotics on a periodic basis and allowing the microbiome to recover, over time, you're going to end up with predominantly pathogenic makeup. Which may be why some of the older studies demonstrated that eating the lactobacillus strains, if you have already a messed up microbiome, may be beneficial.

Another thing directly related to the production of energy is that multiple studies have demonstrated that if the intestinal barrier is intact, which almost entirely depends on oxidative phosphorylation and production of ATP (adenosine triphosphate), then it largely does not matter what kind of bacteria you have. But even if it's mildly compromised, then basically, you're getting bacterial fragments coming into the bloodstream. And then it just so happens that the more compromised the gut barrier is, the more of the pathogenic fragments you are allowing in without actually absorbing the beneficial products, such as the short-chain fatty acids.

Basically, how much the microbiome will affect you negatively depends largely on the intestinal barrier, which depends almost entirely on the production of energy. So, even if you have a very messed up microbiome, you can still be largely OK if you're producing sufficient amounts of energy. But since a lot of these pathogenic bacteria are also producing endotoxin, even if your colony is OK, or in general, the gastrointestinal tract, including the small intestine, even if they're fine, over time the exposure to endotoxin, it's going to interfere with that barrier.

Dr. Joseph Mercola:

No question. Endotoxin is the devil. There's no question. I think there are three things that largely contribute to cancer. It's endotoxin, estrogen and linoleic acid. Those are the three. Those are the three big ones for sure. I want to make a comment on two points. The antibiotics you mentioned, that was another contention I had with the Ray Peat community, is that they would

actually advocate the use of antibiotics for treatment of the gut. Now admittedly, they tended to focus and concentrate on ones that were less challenging, like the tetracycline family. But still, they're antibiotics, and I think that's a last-ditch resort. And I'm not disputing the fact that many people did get improvement, but it's not the solution. You don't go in and kill these things. You need to restructure that. The other important point about the intestinal barrier I want to mention, it's really important. I mentioned Akkermansia. Are you familiar with Akkermansia? Have you heard of it before?

Georgi Dinkov:

I know it's one of the species that's there, basically. It's supposed to be good for us.

Dr. Joseph Mercola:

You know what its last name is?

Georgi Dinkov:

No.

Dr. Joseph Mercola:

Well, there are many different species, but the primary one is muciniphilia. So, the first name is mucin. It produces most of the mucin in your gut. And you're talking about leaky gut. You could have holes punched in there, but if you have mucin covering over it like this giant Band-Aid, you don't have a breach in the barrier. You can have the holes, but it's plugging it up. It's like, I don't know, It's like a patch, a rubber patch on a tire. You get a leak, it'll patch it for you. And when this Akkermansia is gone, you have big problems.

And you're right, you get leaky gut because you don't have enough mucin. Because there are two separate issues going on, and I don't think they're looked at independently. You've got the mucin layer and then you've got the holes, two separate things. And the mucin will compensate for some of those until your body's able to repair it, assuming you get enough cellular energy to heal up those holes, because ultimately you want that. But it would make sense that your body has a rescue mode, it has a repair kit. Why wouldn't it have a repair kit?

Georgi Dinkov:

Of course, it's not trying to kill – Yeah, that's the whole point of that. Cancer is not an attempt to kill, it's an attempt to fix something. But without sufficient energy, you get a substandard fixing, and ultimately kills you because it's just not fixed properly.

Dr. Joseph Mercola:

Yeah. Yeah. That's the key. And I think the fundamental solution is to increase your cellular energy. I don't think you can do anything until you have optimized cellular energy production.

Georgi Dinkov:

I agree.

Dr. Joseph Mercola:

That's the core. And that's what Ray Peat's work [is]. It's his life's work. That's what he called bioenergetics medicine. And he was the single best leader in understanding that and bringing that work to life. So great kudos to him for doing that.

Georgi Dinkov:

Intestinal motility [is] also almost entirely dependent on metabolic rate. One of the old diagnostic criteria for hypothyroidism was how often you go to the bathroom. And apparently, it used to be normal to go after almost every meal. Not after every, but almost every meal.

Dr. Joseph Mercola:

Yeah, yeah. Three, four times in a day.

Georgi Dinkov:

Now, I think normal is basically once a day. And even if you go once every two days, the doctor is not necessarily worried. My kids, sometimes they're constipated. We call the doctor and they say, "Well, if it continues for a week, then give me a call." And I thought, "A week? We could get poisoning if you don't go to the bathroom for a week." But that's the currently accepted level of optimal motility. I think it should be at least once a day. Maybe twice is probably optimal. And also, they have the composition of the stool, whether you're dehydrated, and basically whether you have "fermentative colon," as they're calling it. I think the companies that are doing the microbiome analysis, they can give you a pretty good idea of what's going in your colon, which will largely reflect your metabolic rate as well. So if you're not going to the bathroom very often, and if you're going too often for urination, those are two very good signs of low metabolic rate. Too much urination, not enough excretion of fecal matter.

Dr. Joseph Mercola:

Yeah, I agree. I think that it's really – Remember, I opened this up with saying the importance of the microbiome, and I had a really good idea. The problem with these microbiome tests, they typically aren't covered by insurance. And the least expensive one you can find is about $500, and they go up to $1,000. And they all use the same piece of equipment, it's this DNA sequencer, or RNA, but made by a company called Illumina. They control the market. Not control it, but they've captured the market for whatever reason, probably they're doing a really good job.

I contacted three of the largest companies that test microbiome, talked to their chiefs of people, if not their CEO or founder, and I had a good idea. I said, "Listen, people need this test. It's going to be absolutely essential. Why don't we do something? We'll promote your test for free. We

won't take any money for it, we'll just promote it, but we got to sell it for $50." That was my goal. And I got one company who agreed to it, then they backed out on it. The other company said no. I'm opening up – You don't know this yet, but I'm opening up a clinic system real soon.

Georgi Dinkov:

Excellent.

Dr. Joseph Mercola:

Certainly, it's going to start in my clinic in South Florida, and it's going to be extended throughout the country eventually. And we're going to be testing for this. I'm actually in the process of negotiating rates for getting this. So we're going to be testing on microbiome, and we're going to have the test for $50, so you can screen it. Now, it's not going to be the same test that they're selling for $500 and $1,000. It's going to be six keystone species. But for most people – See, almost every one of those tests, Georgi, they're focused on disease, just like the conventional medical model. They're looking for the pathogenic bacteria.

It doesn't make any sense. You have someone who's dying from – Because the only reason they're doing that is to try to find an antibiotic to kill it. That's not the way you treat this problem. That is not the way you optimize your microbiome, by finding what the bad guys are and trying to shoot them. No. You find out how many good guys you have, and do everything you can to make those good guys return. Once the good guys return, there's an aspect in [the] microbiome – No, it's not an aspect either. It's a characteristic, it's a feature of microbiology. Something called competitive inhibition. So, that when you have the good guys present, they crowd out all the bad guys. They can't exist because the good guys will win if you give them the environmental circumstances to survive.

And that's the goal – And you only need to test about six, and you can do that much less expensively. So, that's my goal is to just test for the good guys. And if people wanted to test for them, they can. We'll offer that test for them. And that actually helps subsidize the test, because at $50, you're charging less than a cost to do the test. But we want to get it almost free for people to test so they know they have this problem. Because as I said, I talked to these companies and 1 out of 3 of these people don't have any Akkermansia. That's probably the single largest keystone species.

And at some point in the very near future, it doesn't really exist now. There's one company that innovated this, but they don't really have good quality strains of Akkermansia. It doesn't really exist commercially well in the world. We're getting close. There probably will be later this year that they're coming out. We'll be one of the first companies to offer them. But you can actually – Just like you have a garden, you have [a] beautiful, lush garden, all these beautiful vegetables and fruits and stuff, but they die. Well, you got to replant the seeds. Same thing, you got to replant Akkermansia, and then you have the good environmental conditions and they grow back, and you're better.

Georgi Dinkov:

Or they get choked by weeds if the weeds grow too much, right? They compete.

Dr. Joseph Mercola:

Exactly. That's a very good analogy, because those pathogenic bacteria are the weeds. And you can just think it's your lawn. When it's overgrown by weeds, the good grass dies. It's [the] exact same process, competitive inhibition in the grass, the lawn.

Georgi Dinkov:

Little bit amount of resources, and then whichever species takes prevalence, they usually stick around. The others are suppressed.

Dr. Joseph Mercola:

Now, I want to dive into one of Ray's other recommendations that I don't think he recommended enough. He certainly understood it, and I've heard him speak many times and read many of his newsletters that discussed this. And that is the value of collagen, or he typically referred to as gelatin. Now gelatin I think is an inferior form of collagen. Ultimately, it's collagen is the protein. And most people, most professionals, you ask them, "What is the most common protein in the body?" Virtually no one answers that question correctly. Virtually no one.

Georgi Dinkov:

Should be collagen, because it's 30% of your bones and it's 60% of skin.

Dr. Joseph Mercola:

It's 30% of the protein in your body. And I've got a good dearest friend who we're hiring to work in my company. And his passion for the last at least dozen years or so has been osteoporosis, and has been actively involved in screening programs, therapies to improve it. And I asked him what he thought was the single most important nutrient to build up bone density, he didn't know. It's collagen. Why wouldn't it be? 30% of your bone is collagen, 30%. Yeah. And it's interesting, if you look at the microarchitecture and muscles too, even your muscle fibers, your muscle is composed of lots of collagen. It's seamless. The tendons and the ligaments, they merge into the muscle. They're part of it. It's just the same structure. In fact, around every one of the sarcomeres is collagen. You can't have muscle without collagen, it doesn't work without collagen. It's the most fundamental protein in your body, I think. And Ray understood that. He regularly encouraged, you hear him on his radio podcast, he was always telling people to take gelatin. He would say gelatin, but it's the same thing, collagen.

Georgi Dinkov:

Gelatin [is] just hydrolyzed collagen. So, it just creates jello when you mix it with water. Collagen will not, but it still has the same benefits. Because when you ingest it, it'll get hydrolyzed by the stomach acid and the proteases.

Dr. Joseph Mercola:

I think collagen is a little better because it's less purified, it's less processed.

Georgi Dinkov:

Yes. Longer chain peptides, which tend to have more beneficial effects.

Dr. Joseph Mercola:

Yeah. I think it is – I haven't studied it. You probably have read the literature on it. But my guess is that these peptides are biologically active. It's not just the constituent amino acids that serve as building blocks, but these actual collagen peptides. A peptide is just a series, a string of amino acids, it's not a full protein. But these peptides are bioactive. Would you agree?

Georgi Dinkov:

I can give a direct example. Several studies demonstrated if you ingest collagen with a very large amount of glucose, it doesn't trigger nearly the same insulinogenic response because the collagen can fill in for a lot of the insulin. Some of the peptides are very similar in structure. So, it's like you're ingesting insulin and you don't have to trigger your pancreas to produce as much, so it improves directly your insulin sensitivity with every meal.

Dr. Joseph Mercola:

And this is why I think almost anyone who's doing carnivore [diet] is seriously, seriously confused and mistaken. Do I think that animal protein shouldn't be used? Heck no, I think it's wonderful. I think you will never be healthy without it. But to focus exclusively on muscle meat is a serious mistake. It's profoundly serious and will accelerate your demise. There's no question. You cannot be absolutely healthy without collagen. It's physically impossible.

Georgi Dinkov:

I agree. But if you're eating the burgers that sell in most of the stores, because they're made with some of the cheaper cuts, which include a lot of collagen-

Dr. Joseph Mercola:

Or hock meat.

Georgi Dinkov:

-you're probably doing okay. Don't eat filet mignon. Filet mignon is very expensive and very bad for you. Go for the skirt steak or for the burgers that include a lot of collagen, because they have – In the effort to keep the price low for production, they're including more collagen than we would like.

Dr. Joseph Mercola:

Yeah, it's cheaper. It's a cheaper form.

Georgi Dinkov:

Exactly.

Dr. Joseph Mercola:

And they try to get rid of it, but they don't realize, what the average person would see as it's compromising the quality actually turns out to be a really good thing. A really good thing.

Georgi Dinkov:

Exactly.

Dr. Joseph Mercola:

Yeah, because that's where they put the good parts in and you get them. So if you were to think about it and make a recommendation for collagen, I think we've made a pretty solid argument that it's foolish – Well, let me just extend the reasons why it's foolish, because it doesn't have the three amino acids. There are 20 amino acids, and some of them are considered essential. But the primary amino acids in collagen are – well, there's a few points here, but are glycine, proline and hydroxyproline. There are others of course, but it's not so much what the amino acids are, it's what amino acids aren't there. And you've said this many times on your podcast in interviews, but the things would be tryptophan, cysteine and methionine. They are very, very low-quality, it's almost non-existent in collagen, they're just not there.

Georgi Dinkov:

Tryptophan is the only one, despite being essential, that in large amounts is directly carcinogenic. It's the only amino acid that can do that.

Dr. Joseph Mercola:

And here's an anomaly because I've got some really interesting things I can't wait to share with you, but cheese, I was shocked it has a high amount of tryptophan, significantly more than egg whites. I thought egg whites were the highest source but I think it might be cheese. But somehow in some way, and I don't know, I think it's somehow buffering the impact of tryptophan, but cheese is a health food in certain circumstances and I'll expand on that in a moment. But assuming that you have the healthy cheese, which I believe is one of the healthiest foods on the planet is cheese, I'll expand on some of the reasons for that. But why do you think that high tryptophan in cheese isn't as detrimental?

Georgi Dinkov:

Something about the casein protein, which cheese is 100% casein if it's properly made, the whey has been completely removed. Casein has been shown in multiple studies to have a direct anti-stress effect. And because it has a high content of the branched-chain amino acids as well, they compete for absorption from the gastrointestinal tract with tryptophan. I think I mentioned it in one of the podcasts. So, you ingest a lot of tryptophan but you're not absorbing the tryptophan.

Dr. Joseph Mercola:

It's a tryptophan blocker.

Georgi Dinkov:

Yeah, exactly.

Dr. Joseph Mercola:

I didn't know that, that makes perfect sense.

Georgi Dinkov:

So is the calcium.

Dr. Joseph Mercola:

It's not a buffer, it's a blocker.

Georgi Dinkov:

Yeah, calcium and the branched-

Dr. Joseph Mercola:

And they [inaudible 00:27:20]-

Georgi Dinkov:

Yeah, yeah.

Dr. Joseph Mercola:

Wow. And it buffers the branched-chains from coming in because we know – I mean, the health community has [and] I certainly had a misperception of the value of branched-chain amino acids and even take it as a supplement. Well, that probably is not a good idea.

Georgi Dinkov:

Yeah, by itself it's not.

Dr. Joseph Mercola:

The branched-chains are problematic.

Georgi Dinkov:

If you only take them, they outcompete the aromatic amino acids, which are L-tyrosine, phenylalanine and tryptophan. So, this means they will deplete because there's something called the blood-brain barrier, and the branched-chain amino acids compete with the other three amino acids for uptake into the brain. So, if you're only taking the branched-chain amino acids in large doses, you're going to deplete both tyrosine and tryptophan in the brain, which means both your serotonin and dopamine levels will drop. But if you take the branched-chain amino acids with L-tyrosine or phenylalanine, it will deplete tryptophan and the serotonin, but dopamine levels will rise.

In fact, there is a study with mice showing that you can abolish the so-called central fatigue due to exhaustive exercise without giving any calories – Well, the amino acids have a few calories, but giving basically a few grams, the equivalent of a few grams of branched-chain amino acids and 1 or 2 grams of L-tyrosine, which shows you that most of the fatigue that we perceive, it's not due to energy depletion. It's due to the accumulation of serotonin in the brain. Branched-chain amino acids have that effect in the brain and also in the gut. So, if you're consuming L-tryptophan, methionine or cysteine, consuming them with foods that contain a decent amount of the branched-chain amino acids or calcium. Or aspirin, aspirin is another.

Dr. Joseph Mercola:

Or cheese. Or cheese.

Georgi Dinkov:

Or cheese, exactly, that's the natural way. But the phenolic molecules are very widely present in nature so if you're consuming a lot of fruit, which contains many of those phenolic molecules like salicylic acid and some of its analogs, those also have a direct inhibiting effect on the absorption of all three of the inflammatory amino acids from food.

Dr. Joseph Mercola:

Now, I'm going to make a relatively outrageous statement and I suspect you know the answer, but you may not. I think you do. I contend that 90% of cheese is not a health food. In fact, it's very dangerous for you. And obviously, if it's processed, it's going to be. But I'm assuming even if it's whole milk, non-pasteurized, biodynamic Amish milk. Why is it not good for you? What is the reason it makes most cheeses not healthy for humans?

Georgi Dinkov:

Well, the ones that are sold in the stores, they use vegetable kind of a rennet and-

Dr. Joseph Mercola:

That's it. I knew you knew it. They call it – Listen, it is not vegetable rennet, it's synthetic rennet.

Georgi Dinkov:

Synthetic, I'm sorry. I ordered those cheese made in the lab. Yeah, and GMO (genetically modified organisms) too.

Dr. Joseph Mercola:

It's GMO rennet.

Georgi Dinkov:

Yeah.

Dr. Joseph Mercola:

Do you know the company that makes this and sells it? Can you guess?

Georgi Dinkov:

Monsanto probably. Monsanto or one of its-

Dr. Joseph Mercola:

Pfizer.

Georgi Dinkov:

Pfizer, there you go.

Dr. Joseph Mercola:

Pfizer. Yeah. And they started in [the] late '90s. I got to tell you an interesting story. I did not grow up eating healthy and my mom, I loved her to pieces, she loved me and is largely responsible for most of the beneficial things I've been able to do in life because of her unconditional love. But she didn't know any better and she gave us desserts after every meal. And it wasn't healthy desserts, but she thought she was helping us. She was just doing a loving thing in her mind. And I would say more than half of my teeth had mercury amalgams by the time I was in high school. I was loaded with mercury amalgams. So, I had to get them removed. By the time I could afford it and was in medical school and earning a living, as soon as I found out it was dangerous, I went out and had them all removed.

And the guy I saw was well-intentioned but he was not a biological dentist. He didn't know, no idea, no precautions were taken. And he damaged my kidneys to the point where there were

problems. Potentially if I went unchecked, I could have been on renal dialysis because mercury is nephrotoxic, no question about it, it kills your kidney cells. But then, it was like the mid-90s that happened, and about the same time they introduced this synthetic rennet. I had no idea it was an issue. And I love cheese. I'm assiduous and I was taking my blood test all the time, usually at least once a month, sometimes twice a month. I do it twice a month now. And I would notice that anytime I'd had cheese, my kidney function would be destroyed.

I mean, creatinine should be like about 1, 1.1. If it goes up into the high 1s, 2s, you're looking at pre-renal failure and dialysis, it's a problem. So, it doesn't take much to switch it. So, I'd get up to 1.4, 1.6, even 1.8, which is a problem. But if I avoided cheese and I kept my protein lower, like 120 grams a day, then I can get by and I can get it to the 1, 1.1, well, maybe 1.1 to 1.3. But it had to stay at about 120 grams of protein, which I wanted to take more, but I couldn't because my kidneys couldn't tolerate it. So then Ashley Armstrong, and you know of Ashley, right? Have you been on her podcast before?

Georgi Dinkov:

Oh, yeah.

Dr. Joseph Mercola:

Okay. Yeah. So you know her well.

Georgi Dinkov:

They've invited me. The Strong Sistas, right?

Dr. Joseph Mercola:

The Strong Sistas, yeah. They're both great. And so, she told me about the animal rennet. Maybe I'd heard it in the past, but I ignored it and didn't think it was an issue. And she actually produces cheeses, too. So she sent me some and I loved it, and she said this, so I went crazy. My creatinine was 1.4 and I was at 120 grams. I just would love the cheese so much, I didn't even look at the protein. I was up to 180 grams of protein. I went up by 50%. It should have gotten my creatinine to 1.8, 1.9. I retested, and two weeks later – Because I was having a half a pound or more cheese a day. I loved it.

Georgi Dinkov:

Wow.

Dr. Joseph Mercola:

I just loved it. And as I said, before the test started, my creatinine was 1.4, it went down to 1.2.

Georgi Dinkov:

While eating all of this protein.

Dr. Joseph Mercola:

All the protein and the cheese. Both of those things would've destroyed my kidneys in the past. So obviously, the rennet wasn't in there because she used animal rennet, which is what you need to do. Folks, do not ever buy cheese unless you can see on the label "animal rennet." If it's not, just put your head down, think of a relative or neighbor that you really don't like, and give them that cheese. Say, "Have that."

Georgi Dinkov:

Dr. Fauci, nailed it.

Dr. Joseph Mercola:

Go for it. But don't eat it yourself or don't give it to anyone you love. So, I wasn't getting the animal rennet, but what I'd come to realize is another principle that Peat advocated was it's the calcium to phosphorus ratio. And Peat, I heard him just recently in a podcast, I mean obviously it was an old podcast, but when somebody asked him how much calcium, he was eating 3 grams of calcium a day, 3 grams, 3 grams of calcium, plus his phosphorus level was half. And interestingly, I did an analysis in Cronometer. I was the same way. My calcium was 3.3 grams and my phosphorus was 1.6. This is almost exactly 2-to-1. And phosphorus is a potent nephrotoxin, very potent.

Georgi Dinkov:

And mitochondrial toxin directly.

Dr. Joseph Mercola:

I did not know that.

Georgi Dinkov:

Dr. Saladino asked me for a reference. I found them. I can send them to you afterwards.

Dr. Joseph Mercola:

Oh, yeah, definitely.

Georgi Dinkov:

Yeah, directly inhibits.

Dr. Joseph Mercola:

I did not realize that. Phosphorus is a problem. But why does cheese work? Because the calcium in the cheese, as long as you have much more than the phosphorus, the extra calcium will bind the phosphorus and it's out in the urine or maybe it was bound in the stool probably, right?

Georgi Dinkov:

Both. Basically, it will prevent it from getting into the cell. And then the calcium itself activates pyruvate dehydrogenase (PDH). So, it's several of the Krebs cycle enzymes. So it's directly pro-mitochondrial-

Dr. Joseph Mercola:

Well, you can expand that too because PDH, pyruvate dehydrogenase, that's the throttle control. You want everything you do to activate that enzyme and to do everything to stop the inhibitors of that, because that pushes it into glycolysis, and that will give you less energy. Big time. So, I thought you'd enjoy that story.

Georgi Dinkov:

I like that a lot. Yeah. Basically, you guys are eating at the Maasai level amounts of calcium, I think they average between 3 and 5 grams a day, depending on how often they kill a cow because for them, cows are the main source of food.

Dr. Joseph Mercola:

I advocated animal meat and I was eating bison for many years and I'd gradually cut it down to 3 ounces a day. In other words, it would take me five days to eat a pound. But once I got the cheese back on, I stopped the bison. I'm just eating cheese.

Georgi Dinkov:

I think it's great. It's not just the calcium, the casein protein itself has some direct anti-aging effects. Do you know this guy Shirali Muslimov? National Geographic did a movie about [him]. There was documentary done by National Geographic in the '70s. This guy is an Azeri guy who used to live in present-day Azerbaijan and lived to the ripe age of 168.

Dr. Joseph Mercola:

I might hit that someday.

Georgi Dinkov:

Confirmed by an official passport issued to him by the Tsar during the Russian Empire. He got married at the age of 120, had two children at the age of 128.

Dr. Joseph Mercola:

And you believe the records? It's not like-

Georgi Dinkov:

Oh, no, National Geographic verified it. They went there. It wasn't a scam.

Dr. Joseph Mercola:

Wow.

Georgi Dinkov:

I mean, we have to find that movie. I think a lot of people will-

Dr. Joseph Mercola:

Send me that article. Send me that article. You got it?

Georgi Dinkov:

Yeah, I'll send it.

Dr. Joseph Mercola:

Yeah, send me that link. I got to look at that.

Georgi Dinkov:

And the only reason he died is that at the age of 167, while riding a horse, [he] fell off the horse and broke-

Dr. Joseph Mercola:

Accident.

Georgi Dinkov:

-a major bone and just didn't recover. Otherwise, he was physically active and healthy.

Dr. Joseph Mercola:

He needed CO2. If you have high CO2 levels, you'll never break a bone unless you're in a high-speed motor vehicle crash with enormous forces. But falling off a horse, you'll not break a bone.

Georgi Dinkov:

His diet was predominantly cheese and bread. That's what the article said about it.

Dr. Joseph Mercola:

Yeah, cheese, that's so good.

Georgi Dinkov:

That's what he was eating. He was a shepherd.

Dr. Joseph Mercola:

Okay. So now I want to go back to the collagen because I think there's great value here. And it is collagen. You could use gelatin and it's less expensive, but it's processed and you're not going to get the value of these collagen peptides that have great biological value. So what would you think is the best source of collagen?

Georgi Dinkov:

So now it depends on the animal because lately, they've been scaring us with avian flu, with mad cow disease. And I guess porcine is probably the least likely one to have any kind of a viral or bacterial contamination. But I would say the skin of the animal is probably the best source. And also the bones. Now the bones, like if you're dealing with bones, then if it's a cow and there's mad cow disease in the country it may be a problem, but skin, even from a sick cow, is usually OK. So as long as it says that it's been produced predominantly from skin sources, then I think it's okay.

Unfortunately, there are some companies out there that are making it from feathers, from horns, from hooves. Now all of these are collagenous tissues, obviously, but I've tried all of them. It's just that they're using it as a source because they're much cheaper. The Japanese company, Ajinomoto, which is very famous for producing a number of different amino acid products, unfortunately, most of them are made from feathers. So I've tried them. It doesn't affect me badly, but I wouldn't use it as a major source.

Dr. Joseph Mercola:

Well, let me offer you some insights from what I've learned. I recently got a dog, a Great Pyrenees, beautiful animal, still a puppy, 6 months old, weighs 70 pounds at 6 months.

Georgi Dinkov:

Wow. A puppy.

Dr. Joseph Mercola:

Yeah. I'm actually training him. He's gone through a lot of obedience training. I'm actually getting him for protective therapy too, because these are great protectors. He will ultimately be about 150 pounds.

Georgi Dinkov:

Are they shepherd dogs?

Dr. Joseph Mercola:

No, they're bigger than shepherds. But they're a type of shepherd, they're a mountain shepherd dog.

Georgi Dinkov:

Right.

Dr. Joseph Mercola:

But they're bigger than German Shepherds for sure. Quite a bit. So I'm trying to figure out the best bone for him. And I've learned through people who do this that there's a bone called the knuckle bone. Have you ever heard of that before?

Georgi Dinkov:

Not really.

Dr. Joseph Mercola:

Okay. Knuckle bone is the term the butchers use for a cow knee.

Georgi Dinkov:

Oh, okay.

Dr. Joseph Mercola:

Can you imagine the connective tissue in a knee?

Georgi Dinkov:

Yeah, a ton of collagen there.

Dr. Joseph Mercola:

Can you imagine any other joint? Maybe the shoulder, that has more connective tissue?

Georgi Dinkov:

No, the shoulder, no, because there's a lot of meat around it and it's just bare bone actually. So the knees of the cow are probably the most.

Dr. Joseph Mercola:

The knees have the most connective tissue of anywhere in the animal, would you agree?

Georgi Dinkov:

Yeah. And ankles, if you can get ankle, but knee is bigger.

Dr. Joseph Mercola:

The ankle. Yeah, the knee is much bigger. So I get like 40 or 50 knuckle bones. I put three of them at a pot and fill up the pot so that all the bones are submerged. First of all, you cut off as much fat as you can because you can't get the knuckle bones without fat, so you do that. And then if you look at the recipes, most of the recipes say to cook it for 72 hours and put some vinegar in it. Well, you could do that, but that's a pain in the butt. Bone broth is another way that it's classified as.

I first encountered that maybe 15, 20 years ago, probably 20 years ago. There was a neurologist who had an autistic child. Her name was [Dr.] Natasha Campbell McBride, and she had an autistic child, and she had great improvements with this bone broth. And I tried it, and it was just a pain to make it for 72 hours. But then I realized we have a new innovation, it's called a pressure cooker. And you can pressure-cook these bones for two to four hours. I say two hours if the bones are from a CAFO (concentrated animal feeding operation) animal, where they could have lead and other heavy metals in the bone. So you don't want to cook them that long. And maybe that's the only bones you can get, but if you can get an organic grass fed cow bone, you can cook them for four hours. Now it's going to take longer than four hours because it takes time for that water to heat up, and it takes time for it to cool down. So it's probably closer to six hours by the time you can take it out.

And don't make the mistake of just saying that's the bone broth. No, because there's a lot of dissolved fat in there. So, you want to let it cool down, go in the fridge and skim off all the fat because that fat isn't really good for you. You don't want a lot of fat. There's no reason you should have that fat. You want the collagen. That's the miracle that you're going for. And then you've got almost a magic broth. I don't think there's a finer collagen on the planet, truthfully.

Georgi Dinkov:

Are you giving it to the dog or is this for yourself or for both?

Dr. Joseph Mercola:

For both. We share it.

Georgi Dinkov:

Both.

Dr. Joseph Mercola:

Right now I'm about 185 [pounds], and the dog is 70, so I'm more than double his weight. But I give him still more than half of what I'm getting because he's a growing boy.

Georgi Dinkov:

Still a puppy. Seven months, right?

Dr. Joseph Mercola:

Closer to six months. He just had his birthday just a few days ago. No, I'll put a picture in here. He's just an adorable dog. I mean, he's so cute. I got him to guard my chickens because I had 50 chickens and four geese that were killed by predators. And I said, "This is nonsense." The predators, they're dead meat now. Basically, Great Pyrenees are a livestock guardian dog. They're called LGDs. Not just chickens, but cattle, not cattle, goats, sheep, pretty much anything. They'll just destroy these predators.

Georgi Dinkov:

What kind of predators are getting your chickens? That's in Florida, right?

Dr. Joseph Mercola:

It's foxes. Foxes. They're so quick.

Georgi Dinkov:

Oh, foxes. Okay. Raccoons, maybe? Raccoons?

Dr. Joseph Mercola:

No, it's mostly foxes. We got them on a video recorder, but they're so fast you can't even see them on the video recorder. They're like lightning, these animals. They're crazy fast.

Georgi Dinkov:

Well, they're not faster than a dog. I guarantee you, he'll grab one and start shaking it.

Dr. Joseph Mercola:

And it's kind of like a car alarm, in some words because they're very sensitive to sounds and stuff. They will sense them and they'll start barking. If any predator has common sense, they'll run the other way.

Georgi Dinkov:

They're leaving.

Dr. Joseph Mercola:

But some of them don't, then they're dead. Anyway, so that's the bone broth. And then I combine – I was actually interviewing Brad Marshall. Have you heard of Brad Marshall's work?

Georgi Dinkov:

Yeah.

Dr. Joseph Mercola:

He has this supposition, he believes starch is much healthier, and I think he's right, just the starch. But the caveat is that you have to have a healthy microbiome. If you don't, then it's a problem. It's definitely a problem. But if you have a healthy microbiome and you use a starch, it does a lot of good things. It radically improves your health. So basically I make six cups of rice – I do three cups for – Some six cups of rice – Basically between my dog and I, we have three cups of cooked rice a day. That's a lot of rice. I think the cooked rice, it's-

Georgi Dinkov:

A couple of hundred grams of carbs, basically in that.

Dr. Joseph Mercola:

Yeah, each of us have more than a pound a day of cooked rice. And it's with the bone broth. And it's interesting, I give my dog the option. They have no inherent bias. I put the cut meat with a little fat on it and the bone broth and the rice, guess what food they eat first?

Georgi Dinkov:

The bone broth.

Dr. Joseph Mercola:

Bone broth. No, admittedly that's not complete because I do put an egg yolk or two in the rice. That's the favorite food is egg yolk. I think the bone broth, the rice and the egg yolk is close to an optimal food. It's hard to think of a healthier meal.

Georgi Dinkov:

Yeah. I mean, just the rice and the eggs probably are enough to give you a complete meal just as long as it's the whole egg.

Dr. Joseph Mercola:

The only other thing on top of that is what I do for lunch is, actually I do it for breakfast too, I throw in – Let me see, I'm up to 4 ounces of cheese each. So I'm having half a pound of cheese.

Georgi Dinkov:

Of Ashley's cheese. Not the commercial one, right?

Dr. Joseph Mercola:

No, no, animal rennet cheese. It doesn't have be Ashley's, but don't eat any cheese unless it only has animal rennet. So that's the thing. And I got to tell you something that is really astonishing. To say it's astonishing is actually quite an understatement. We're starting these clinics. I had to stock the clinic with good clinical equipment and I was seeking to get a lean body mass analyzer. And there's some really interesting instruments out there that use bioimpedance. And actually, in the early '90s, I did my first entrepreneurial venture outside of medicine, was developing a handheld bioimpedance matter. I think I lost a half a million dollars on that, but it was an experiment, but I had a lot of interest in it.

Now the technology is much better for sure. The leader in the field was InBody and they correlate their data to DEXA (dual x-ray absorptiometry) scans. And I said, "Well, listen, I'm Dr. Mercola. I'm one of the biggest influencers in this space. Surely you can give me a good deal on your product." They were selling it for $30,000 and they gave me a minimal thing. They hardly budged it down. And they refused to listen to logic. I said, "Listen, if I like your device and I recommend it, people will really probably go to it." And they said no.

So, that annoyed me so much that it forced me to look at the alternatives. And I'm so glad they were greedy. And they are greedy. They're greedy on steroids. I would never, ever, ever recommend an InBody to anyone. If you are using an InBody device, you need to have your head examined. Why? Because when I looked at it and did a deep dive in this and the alternative, there's a company that doesn't correlate their data to DEXA. They correlate it to MRI (magnetic resonance imaging). And you probably know because you're so smart that MRI is a superior way to measure body fat than DEXA.

Georgi Dinkov:

DEXA mostly works for bones. And even there, it's only about 70% accurate.

Dr. Joseph Mercola:

It's not good. DEXA is not good. It's ionizing radiation. It's a lot of it. It's a lot of ionizing radiation. And here's the other thing, why you got to be absolutely irrational to ever choose InBody or any of the other ones other than this company that does it, which is seca, S-E-C-A. The seca device costs one-third of the price, one-third. And it has a laser device at the top of it to measure your height. And you say, "Well, that's nice." Well, it's a lot nicer than you think because all the other devices, they just tell you to input your height. And I don't know if you're aware of this, but the formulas they use, if you are off by an eighth of an inch, you're going to get a significant measure in your body fat, significant.

Georgi Dinkov:

Because the height is squared. Even a tiny change makes a difference.

Dr. Joseph Mercola:

It's huge. Now I'm going to share with you the results of my bone broth cheese study. Anecdotal of one, study of one, just me.

Georgi Dinkov:

I love it.

Dr. Joseph Mercola:

Okay. So, I did the bone broth and the cheese. First of all, let's talk about my height. I was 6 foot and a quarter inch. I am now 6 foot and three-quarter inch.

Georgi Dinkov:

Wow.

Dr. Joseph Mercola:

I gained a half an inch in height. So clearly, epiphysis of your bones fuse at about 18. My bones did not-

Georgi Dinkov:

Mostly under the influence of estrogen, I would like to emphasize.

Dr. Joseph Mercola:

Oh, I did not know that. Thank you for that refinement.

Georgi Dinkov:

Several anecdotal reports, just as a tangent, people using aromatase inhibitors grow about an inch of height even in adulthood.

Dr. Joseph Mercola:

Wow. That is beautiful. Thank you for sharing that. That is just amazing. I did not know that. It makes sense though. Estrogen is a devil. A lot of people give us a hard time for that. I remember the last time we talked about this. I don't care what they think, because just-

Georgi Dinkov:

It's okay. They went away. They basically decided a lost argument is not worth arguing. I never heard back from them. I did respond. Never heard back.

Dr. Joseph Mercola:

Yeah. Estrogen is a devil for sure. If you're taking it, you should just stop. Go look into our old podcast on this. You want progesterone. That was what almost – I'm convinced, Georgi, that every single adult needs progesterone, every single adult, not kids, but just adults. They'll benefit from it. I take progesterone every day. It's a cortisol blocker. It's an estrogen blocker. And it helps mitigate some of the side effects of excess LA (linoleic acid), so it's just crazy not to. I'm writing a book on it and some of the newer studies, it's a very powerful nervous system adjuvant. It really heals the nervous system. So if you have a neurological injury, it's crazy not to be on progesterone.

Georgi Dinkov:

I'm sure you've seen the studies with TBI (traumatic brain injury). They're using progesterone to recover from TBI?

Dr. Joseph Mercola:

No, I'm not surprised. I think I probably have some of them in my references. But anyway, so I gained a half an inch in height, but I was 8.5% body fat before I went into this. So having the cheese, the bone broth and the rice, I gained 4 pounds.

Georgi Dinkov:

Probably muscle.

Dr. Joseph Mercola:

Went from about 181 to 185. My body fat went from 8.5% to 5.3%.

Georgi Dinkov:

So there you go. So it was all muscle.

Dr. Joseph Mercola:

Yeah.

Georgi Dinkov:

Wow. That's amazing.

Dr. Joseph Mercola:

Almost 85 pounds of muscle in my body, which is pretty high. I mean, it's over the 99th percentile, I'll put it that way.

Georgi Dinkov:

Also, they're saying, the rumor over the age of 40, they're saying you can't get muscle unless you're using "juice."

Dr. Joseph Mercola:

Yeah. Oh, that's baloney.

Georgi Dinkov:

I know. I agree. I agree.

Dr. Joseph Mercola:

So I didn't expand why I gained a half an inch, explain. You know, but for those who don't, it's obvious if you understand health, but the difference comes from the height of your vertebral disc and you have 22 vertebrae, I think. I think that's it. Maybe it's more, I haven't looked at it for a while. But it's a lot. It's over 20 and they can get crushed with time. And the bone broth actually facilitates, I believe, more connective tissue in there, and it causes an increase in intracellular water. Because interestingly, from the time I did this study, my intracellular water increased it by half a liter. A half a liter.

Georgi Dinkov:

You've added bone because it's the bone that can basically absorb a lot of that water and hold it.

Dr. Joseph Mercola:

Really? I didn't know. I didn't know it was the bone. Wow.

Georgi Dinkov:

So, that kind of proves that you added bone. And that's what explains the height as well.

Dr. Joseph Mercola:

I did in a month. In a month.

Georgi Dinkov:

No matter how much muscle you add, it's not going to increase your height. But if you add bone, especially on the vertebrae or the joints, then you're probably increasing height.

Dr. Joseph Mercola:

Yeah. So, it shocked me. I wasn't expecting this to actually – I think I maybe even taller [than] when I was 18. I don't know. It is hard to remember back then, but I know I was never 6' 1". It's just under, but half an inch at the age of 70 is just crazy. Now, do you remember ever reading any of Peat's material? We talked about people gaining height again.

Georgi Dinkov:

So, I know that when you wake up in the morning and you get up, you're supposed to be about half an inch taller than at the time at night when you're going to bed. Because over time, during the day, basically all this weight and walking around compresses the spinal discs and then the joints also inflame, so you lose a little bit of height. But that difference, especially if it's maintained over time. It cannot be explained just by going to bed and waking up. So, if you kept that height difference that you gained-

Dr. Joseph Mercola:

That's a good point because there's great variability. So, I've standardized the test. I take the test shortly after I get up in the morning. So, it's always done at the same time of day so the variables are minimized. And interestingly, just as a point for someone considering getting this type of testing done, you don't want to do it after you work out at all. You'll get spurious results and it's because there's a shift from the water inside the cells to outside, to extracellular, and that will give you a false result. So, do not work out. Do not.

I figured that out myself because I was measuring myself. I would lose – Had a bowel movement or something, I theoretically should have more muscle mass because I have less weight. My weight would go down, but my body fat would go up. And it was because of the shift of intracellular water. And that's how this whole body of impedance works. It measures your body water and the compartments that it's in. And they also measure phase angles, which is pretty good. My phase angle went up a few points, a few tenths of a point, not a few points. That would be extraordinary. Yeah.

Georgi Dinkov:

Is this the device you'll be selling or is this just a company that's selling it, with the laser?

Dr. Joseph Mercola:

No, the laser comes with the product. It's not an add-on. You just get it for free. Yeah, it's pretty cool though. Yeah. It's just, yeah. And if you're looking down, your weight – Kind of [a] standard is to look straight ahead, not up like this or not down, just straight ahead. And that's a fair measure of your height. But I'm still shocked, a half an inch. It's crazy.

Georgi Dinkov:

It's amazing, yeah. Peat gained half an inch by using low doses of DHEA (dehydroepiandrosterone).

Dr. Joseph Mercola:

Really?

Georgi Dinkov:

I think it's 50 or 60. It is in one of the articles.

Dr. Joseph Mercola:

Well, I do, based on your stuff, and I want to applaud you for giving me the insights. A year and a half ago, and I wasn't aware of this, I was listening to Dr. Jonathan Wright and thought that rectal suppository was the best way to go. But no, he said put it into long-chain fat and it makes it a lot easier than doing a rectal suppository. So I think I've got the ideal way to do it. I put a little butter, maybe a teaspoon of butter. I use the DHEA and pregnenolone, and I put three egg yolks, which is another – because it's [inaudible 00:55:09]. How much better can you have it emulsified? You can't.

Georgi Dinkov:

You cannot.

Dr. Joseph Mercola:

The butter and egg yolks.

Georgi Dinkov:

In fact, you don't even need to add the butter because the egg yolk contains a decent amount of long-chain fats as well. So, you just mix it with that. If you don't want to add more fat, that should be good enough. The butter adds to it, too. Studies there – I can send you later – show that a combination of precursor hormones, such as DHEA, pregnenolone, progesterone and even testosterone, their effects on the cell are greatly increased when they're combined only with saturated fats, not with the unsaturated ones. So, especially with testosterone, they were doing tests on rats, old studies from the, I think, '40s and '50s.

So they were giving the equivalent of one-tenth of the regular dose of testosterone that would maintain the sexual function of a castrated male animal. And when they combine it with palmitic acid, which is found in great amounts in butter, then one-tenth of the dose of testosterone was sufficient to actually overshoot the recovery of the animal from the castration procedure. And if you combine it with a palmitic acid in a ratio of 1-to-10 in favor of the fat. So you can get by by using a much lower dosage, which should limit the risk of side effects, especially with things like DHEA and testosterone, and get the exact same effects inside the cell.

Dr. Joseph Mercola:

Yeah. So I just went on a tangent there, I wanted to thank you, but I also wanted to mention that I've been taking DHEA in that format for the way you mentioned it for at least a year and a half. And I was still 6 [foot] and a half, 6 foot and one-quarter inch. I gained a half inch after. So it wasn't the DHEA, I was taking that. I think it's pretty extraordinary. And just to extend, the bone broth – I want to talk about two things. The bone broth is also useful for healing the gut.

Georgi Dinkov:

Yes, absolutely.

Dr. Joseph Mercola:

No question about it. No question about it. So that is one of the – In my mind, I'm such an advocate for bone broth now that I don't think you can be optimally healthy without it. I know what it's done for my own life.

Georgi Dinkov:

All the studies, at least a hundred years old, any kind of digestive ailment, especially bleeding ulcers, the treatment for that was three days, 100 grams of collagen each day, taken orally. Ulcer is gone. Inflammatory bowel disease, also gone. Ulcerative colitis, anything, any digestive ailment that basically has been there for a while, collagen was basically the go-to, and it was curative. Not just maintenance therapy to take all the time, just a week or just a couple of days, and it was considered the cure.

Dr. Joseph Mercola:

And because it's these – I'm sure you can categorize. I forget what the term is, but it's these essentially amino acids that don't contribute to decreasing longevity. But I think they're grouped into a category, and I just don't recall the name of it. But clearly, if you have these amino acid concentrations that are collagen, you are going to add years to your life. There's just no way around it because you're not getting the other amino acids, which are going to shorten your lifespan.

Georgi Dinkov:

Again, direct study, you can mimic the effects of either cysteine or tryptophan or methionine depletion, which are known to extend lifespan when you restrict them. You can achieve the exact same lifespan extension by adding one to 2% of collagen in the diet. That was done in mice and rodents. But because it's metabolic, it should translate directly into humans.

Dr. Joseph Mercola:

That's a small percent. I think it should be closer to 5%. Why? Because typically protein requirements for most people are about the same. It's close to 15%. You shouldn't eat more than 50% of food as protein. That's just excess and certainly more than 10%. So, somewhere in that range, might be 12%, 13%, but in that range. So if you say it's 15% just for grins, a third of it should be collagen. It's 5%.

Georgi Dinkov:

Yeah. I guess they're trying to use the minimum to mimic the effects.

Dr. Joseph Mercola:

MED, the minimum effective dose.

Georgi Dinkov:

Exactly.

Dr. Joseph Mercola:

Yeah, but if you want the optimal dose, it's probably closer to 5%.

Georgi Dinkov:

Close to 5%, yeah.

Dr. Joseph Mercola:

5%.

Georgi Dinkov:

I've tried up to 10% of the protein to be actually collagen. It's fine. In fact, up to 50% of the protein, not the calories, 50% of the protein could be collagen. And anything more than that starts to give me nausea. And there are older studies backing that up. I think if you achieve too much tryptophan depletion and your dopamine rises too much, which is what happens if you deplete tryptophan too much, some of the dopamine agonist drugs on the market, one of the most common side effects is nausea. So that's, I guess, one way of knowing.

Dr. Joseph Mercola:

Oh, okay. [inaudible 00:59:40]. Yeah. So thank you for helping us understand what the upper limit is. Because like anything, there's a Goldilocks dose and a lot of people, myself was in that group and still am in many ways, [think] if a little is good, then a lot more's got to be better.

Georgi Dinkov:

Not always.

Dr. Joseph Mercola:

To know that you don't want to go more than 50% collagen.

Georgi Dinkov:

Nope.

Dr. Joseph Mercola:

You need some essential amino acids.

Georgi Dinkov:

Exactly.

Dr. Joseph Mercola:

Speaking of that, glycine is not considered an essential amino acid, but there's no question in my mind, not a micro-doubt that it's conditionally essential amino acid. Because most people, you can make glycine, but you can't make enough. You cannot make enough glycine to be optimally healthy. It's impossible.

Georgi Dinkov:

There is a proposal now to make both taurine and glycine to be relabeled essential amino acids because without each one of them, we cannot produce bile acids. And without bile acids, there's no digestion. At least of the fats and the fat-soluble nutrients. So they may happen, they may actually become officially essential. But I agree with you that I think they're very, very essential regardless of their official classification.

Dr. Joseph Mercola:

Yeah. And if you can't afford it and you want to at least take a step in the right direction, then glycine will give you a lot of benefit. It's the largest concentration of amino acids in collagen for sure, but it's still not less than optimal.

Georgi Dinkov:

And one other thing about glycine, not many people realize it, but it's an actual neurotransmitter. That's kind of what proves its essentiality. Glycine is the major inhibitory neurotransmitter in the spinal cord, and it's basically one of the major neurotransmitters that regulates gastrointestinal motility. So, without sufficient amounts of glycine in the body, you'll have problems with digestion even if you don't have an inflamed gastrointestinal tract.

Dr. Joseph Mercola:

So, when I mentioned earlier about the ideal food, and I said that ideally you've got some – I add two egg yolks in each of my meals, and then I have a healthy ice cream, which I'm using the Ninja Creami, actually introduced to me by Ashley. You can make healthy ice cream. My healthy ice cream is our collagen protein powder, three tablespoons of maple syrup, two egg yolks and a cup of goat milk.

Georgi Dinkov:

Nice.

Dr. Joseph Mercola:

That's the ice cream. And you can't really tell the difference between that and store-bought ice cream. It tastes almost identical, except it's healthy. And there's no other additive. So I just make it. And so, I have six egg yolks a day, but those egg yolks are from actually Ashley's farm. Because predators killed all my chickens. For the last six months, I haven't had chickens, and I'm probably a week or two away from getting them. I've got 25 chickens, and I've had them for like six weeks and they're still not laying eggs, but they will go shortly. So, yeah.

Georgi Dinkov:

You can eat as many egg yolks as you want. I'm sure you saw in 2018, [the] FDA (Food and Drug Administration) quietly reversed its position on dietary cholesterol.

Dr. Joseph Mercola:

I missed that. They should have. They should've been slapped at the same time.

Georgi Dinkov:

They said it has no implication whatsoever on cardiovascular disease. You can eat all the dietary cholesterol you want. If cholesterol is even involved, it's not the dietary cholesterol that's doing it. So you can eat a ton of eggs.

Dr. Joseph Mercola:

Yeah. And you want to – egg yolks at least. I would be careful. I do not eat the egg whites because of the tryptophan. And the tryptophan doesn't have the inhibitor from the casein or the calcium. So you're going to get it full. So even though it has one-fourth the amount of tryptophan as milk does, it doesn't matter. You're going to get it. So, I do not eat egg whites. I feed that to the chickens.

Georgi Dinkov:

Yep. It also binds biotin. So you can get a biotin deficiency if you eat too many egg whites.

Dr. Joseph Mercola:

Well, that's if it's raw. If it's cooked, it'll deactivate that enzyme, I think. Avidin is the enzyme in there that does that. So, you have to cook it if you're ever, ever going to eat whites, do not eat them raw. And now if you ate the yolk, there's an argument that some say that it doesn't matter because there's more than enough biotin in the egg yolk to compensate for what's bound from the avidin in the egg white. [inaudible 01:03:44]-

Georgi Dinkov:

If you eat whole eggs, you're fine. But a lot of people eat only the egg whites and I've seen bad reactions.

Dr. Joseph Mercola:

Yeah, [inaudible 01:03:50]. My personal trainer for 10 years, that's exactly what he did. I'd give him my whites because he was foolish enough. That's the only thing he ate was the whites. It's a decent form of protein, but high muscle mass is not being healthy. You see bodybuilders dropping dead like flies all the time. It's because it's not just muscles. Yeah, you should have muscle mass, but you don't want extreme muscle mass. It's not the be-all and end-all. It's just a small component. The food is the key one. And it's the major source, eggs are the major source of choline. It's really, really, really hard to get choline unless you're eating egg yolks. I think it's almost impossible. And there are really no good supplements. Although we're developing one, [and] it's going to be liposomal choline. To the best of my knowledge, it does not exist. I would not take any choline supplement at all. They're not that good. They're not that good. I think liposomal choline will get through, but the others are problematic, big time.

Georgi Dinkov:

People who live in the rural areas or the more primitive cultures, which turns out they're anything but primitive. If you get a lot of liver and/or brain, it has a decent amount of choline in it. But other than that-

Dr. Joseph Mercola:

Yeah, that's the only other organ. But I don't know. I haven't looked at the numbers because if you eat too much liver, you got a problem too. You have to be really careful with liver. Take a little, and that's what I give my dog too. I give him some liver pretty much every day, but just not more than 1 ounce or 2, that's it.

Georgi Dinkov:

Yeah, [liver has] a lot of iron and also a lot of cysteine and methionine. So, you don't want to overdo it.

Dr. Joseph Mercola:

No, no. The anti-longevity approach. But you've got to also be careful of what, I think and I suspect you would agree, is the single most pervasive metabolic poison in our food supply.

Georgi Dinkov:

PUFA (polyunsaturated fatty acids).

Dr. Joseph Mercola:

PUFA. Linoleic, specifically linoleic acid. Yeah, PUFA. Yeah, no question about it. So that's why I don't recommend having many egg yolks because of the PUFA. Now, Ashley's eggs are really low. They literally have less than 75% to 80% of the PUFA of a normal egg. So you could have five of her eggs, and that would've as much PUFA as one of the other eggs, store-bought.

Georgi Dinkov:

Than the commercial ones. Wow, that's amazing.

Dr. Joseph Mercola:

Even if they're free-range, organic, it doesn't matter. They're all, the commercial feed – except the one that she and her farmers put together and the one that I use in my home – is high in PUFA. In fact, I think mine's even lower than Ashley's. I can't wait to get the eggs measured because all I feed them is sprouted pressure-cooked split peas and egg whites and rice. And there's very little, virtually no linoleic acid in there.

And you can do that with hogs too. But one of the tricks for hogs, I don't know if you know it, is when you have milk and you make butter, what you get out on the other end is like skim milk or no-fat milk. They almost take all the fat out, and that no-fat milk is wonderful, wonderful food for hogs. It makes them have the saturated fat they were designed to because it's the other fats in there that cause the problem. So they're essentially – It's like [what] we were talking about before on some of your podcasts with the skim milk or no-fat milk. I think you even tried it for a while, didn't you?

Georgi Dinkov:

Yeah, yeah. It's a great food, but at some point, I start craving fat if I go on zero fat for too long. So for me, the optimal amount of fat is about 5% to 10% of calories. Less than that will be better for weight control. But it just feels like something's missing taste-wise so that's [crosstalk 01:07:27].

Dr. Joseph Mercola:

Yeah. Well, for sure. Yeah. And I was eating the cheese, just eating it at room temperature, and then I realized, I love pizza. I think everyone loves pizza. So, I started to melt the cheese in my rice, and boy, that was next level. That was orgasmic almost. When you have hot fat, that's the best.

Georgi Dinkov:

Yeah.

Dr. Joseph Mercola:

There's something, there's a transition-

Georgi Dinkov:

Fat is the flavor.

Dr. Joseph Mercola:

Yeah.

Georgi Dinkov:

Flavor is in the fat.

Dr. Joseph Mercola:

It just takes it to the next level. Next level. There's a difference between cold pizza and hot pizza, right? Yeah, they're both enjoyable, but you got to be out of your mind if you say the cold pizza tastes better.

Georgi Dinkov:

Yeah. Something truly about melted cheese, specifically, that's really good. Or cooked bacon. I know it has a lot of PUFA, but still something about the smell of the fat.

Dr. Joseph Mercola:

Well, those pigs were eating non-fat milk.

Georgi Dinkov:

Yes. Then it will have almost none. There's another farmer, which contacted me several years ago before Ashley, and he feeds his pigs a lot of butter.

Dr. Joseph Mercola:

Was that Brad Marshall?

Georgi Dinkov:

Oh, it could be him, yeah. Yeah, it could be him. I mean, because only one person-

Dr. Joseph Mercola:

Guess who bought his business?

Georgi Dinkov:

I don't know, who?

Dr. Joseph Mercola:

Ashley.

Georgi Dinkov:

Really?

Dr. Joseph Mercola:

Yeah, yeah.

Georgi Dinkov:

Okay. Okay.

Dr. Joseph Mercola:

Actually, Brad's one of my researchers now. So, his passion is doing research like molecular biology, and he was doing hog farm, but he couldn't do both. So, he sold his business to Ashley.

Georgi Dinkov:

Excellent. Perfect.

Dr. Joseph Mercola:

And she's going to make those hogs, create them, the food supply. So anyway, that's my update for you. So I think we should have you share your data on the studies you're doing with the mice.

Georgi Dinkov:

Yes. I'm doing some follow-up studies. If you can wait a week or two, I'll have more better news than what I expected.

Dr. Joseph Mercola:

Okay.

Georgi Dinkov:

What I got with the first one, and it's really interesting. Basically, the vitamins by themselves did something but not enough. The aspirin by itself did something, but not enough.

Dr. Joseph Mercola:

And which vitamins were you using?

Georgi Dinkov:

B1, B3 and B7, which is biotin. And for every single one of these, there are a lot of studies historically going back almost a hundred years that they're involved in the cancer metabolism in the Warburg effect and whatnot.

Dr. Joseph Mercola:

Well, where is B1? It's in the ETC (electron transport chain)?

Georgi Dinkov:

So, B1 is the cofactor for pyruvate dehydrogenase. No, B1-

Dr. Joseph Mercola:

Oh, that's where it's at. So it's pre-ETC. Okay.

Georgi Dinkov:

Yeah. And also, turns out B1 has a direct inhibitory effect on something called PDK, pyruvate dehydrogenase kinase, which is the inhibitor of PDH. So not only it increases PDH, it inhibits the thing that inhibits PDH. And then we have niacinamide, which converts into NAD+ (nicotinamide adenine dinucleotide). So NAD+ to NADH (nicotinamide adenine dinucleotide (NAD) + hydrogen) ratio, another controlling factor for pyruvate dehydrogenase. NAD+ inhibits lipolysis, so you have less supply of fat to the cancer cells. And you have biotin, which a lot of people say, "Well, why did you choose biotin?" Several studies, very interesting ones with humans, the first one was a couple years ago with primary progressive multiple sclerosis, really nasty condition. Within five years, these people in wheelchairs – and they don't survive from much longer afterwards – 300 milligrams of biotin, which is a very, very large dose considering that 1 milligram is usually what you find in most supplements, stopped the progression of primary progressive multiple sclerosis.

The researchers were just – their jaws dropped, and the proposed mechanism was dramatic improvement in mitochondrial function. And then another study came out after the multiple sclerosis, with Huntington's disease, also with humans, [a] smaller one, I think it was five or 10 people, also showing arrest of the progression of disease. And then I looked at some of the older studies that were in vitro, [which] showed that if you add biotin to cell cultures, you dramatically increase the production of carbon dioxide, which to me said, "Oh, must be doing something through the Krebs cycle." Just increasing the throughput through the Krebs cycle, which is part of the mitochondrial metabolism. So, just threw it out. First I started with thiamine by itself, B1 had an effect, not strong enough. Then I added B3. Stronger effect, but it just stopped the tumor but it didn't-

Dr. Joseph Mercola:

Was the B3, niacin or niacinamide?

Georgi Dinkov:

Niacinamide. Niacinamide.

Dr. Joseph Mercola:

Okay.

Georgi Dinkov:

I have not tried niacin.

Dr. Joseph Mercola:

Okay, good. [inaudible 01:11:38].

Georgi Dinkov:

I may.

Dr. Joseph Mercola:

[inaudible 01:11:40] niacinamide, yeah.

Georgi Dinkov:

Yes. And then added biotin and the combination of the three actually fully stopped the tumor growth, but it didn't make the tumor regress. So I said, "Okay, what else can we do?"

Dr. Joseph Mercola:

What tumor model were you using?

Georgi Dinkov:

It's called a JEKO-1, JEKO-1 cell line. It's a human, I'm emphasizing human, mantle cell lymphoma.

Dr. Joseph Mercola:

Okay.

Georgi Dinkov:

Basically, a tumor that, at least when transplanted on immunocompromised animals, has a 100% lethality and 0% regression with either treatment or spontaneous. So the nastiest thing you can find. At the lab head I said, "Well, let's start with that." My daughter used to tell me when she was a baby, she said, "Daddy, if you want to learn how to love, you got to practice on somebody you really hate." So I said, well, let's try this in cancer.

Dr. Joseph Mercola:

Very wise child. Very wise.

Georgi Dinkov:

Yeah. Thank you. So I said, let's try something really lethal because if it works on that one, maybe it'll work on the other, less dangerous ones. So the vitamins work, but did not get rid of it. So I said, "What else can be done?" Then I added aspirin and a human equivalent dose of about a gram and a half a day.

Dr. Joseph Mercola:

That's a pretty high dose.

Georgi Dinkov:

Yeah. High, but not nearly as high as what people take for rheumatoid arthritis. They take 4, 8, 6 grams.

Dr. Joseph Mercola:

That's four aspirin a day, isn't it? At least.

Georgi Dinkov:

Yeah. So, it should be doable, right? I mean, it's not at the toxic level. It's high, but it shouldn't be causing toxicity. And that experiment, three mice, all of them, the tumors regressed fully. And then we kept the mice alive after the tumor disappeared to see if there'll be any recurrence. One of them looked like there may be a recurrence, but then after a few days disappeared and after 70 days – Normally the study lasts about two weeks because the tumor is so lethal. After 70 days, two and a half months later, [in] all three mice, completely [the] tumor disappeared, did not come back. And now we're doing follow up with – there is an analog of aspirin known as 2,6-dihydroxybenzoic acid, much stronger acid, and much more lipophilic. So I thought, well, one of Ray's main theories was that the reason cancer cells –

Because they're metabolically dysfunctional, we all know that, and typically a cell like that commits apoptosis. But in order to commit apoptosis, that mechanism is controlled almost entirely by the intracellular pH. And in order for apoptosis to occur, it needs to be in the acidic range. But the cancer cells are alkaline due to exporting lactate and hydrogen ions. So if anything can drop the intracellular pH, those cancer cells, because they're deranged, should actually disappear by themselves. And one of Peat's suggestions at the time was, "Why don't you use the drug acetazolamide?" Which is a carbonic anhydrase inhibitor, increases carbon dioxide. Carbon dioxide is acidic, and then that should allow cancer cells to commit apoptosis. There are some studies in vitro and in vivo showing that acetazolamide may work, but it didn't really cure the tumors.

It was a slower growth, partial regression, but it showed that the idea was on the right track. So I said, "Let's find something that's much more acidic than carbon dioxide." And that is this 2,6-dihydroxybenzoic acid, which is just one extra hydroxyl group on top of aspirin. Salicylic acid, really, which is 2-hydroxybenzoic acid. And then this thing is about 10 times more potent than

aspirin and was used in the ‘60s and ‘70s to treat rheumatoid arthritis in doses 10 times lower than aspirin. So, if you’re taking 8 grams of aspirin daily, 800 milligrams of this thing [will] completely disappear any symptoms of rheumatoid arthritis in 24 hours. I can send you the studies, but they did not like the fact that it changed the electrolyte balance in humans. At that time, they thought this is unacceptable toxicity, so it never really gained traction. So I added that. And now, instead of aspirin, we’re using this in addition with the vitamins. And the latest study-

Dr. Joseph Mercola:

What was the [inaudible 01:15:26] on the new one?

Georgi Dinkov:

Oh, much lower, 10 times lower than the aspirin. So if the aspirin was-

Dr. Joseph Mercola:

[inaudible 01:15:30].

Georgi Dinkov:

-1.5 grams daily, this is 150 milligrams daily, for sure.

Dr. Joseph Mercola:

Wow.

Georgi Dinkov:

Almost nothing.

Dr. Joseph Mercola:

Okay, wow.

Georgi Dinkov:

And two of the tumors already fully regressed one week after starting the follow-up study.

Dr. Joseph Mercola:

Wow. Is this drug, aspirin, analog, available, or is it-

Georgi Dinkov:

It’s freely available. No patent, nothing on it. Quite a few studies back in the day, but really a very generic molecule.

Dr. Joseph Mercola:

Just from the chemical companies? It's not commercially available-

Georgi Dinkov:

Yeah, Sigma. Yeah, available for any company you can imagine. Dirt cheap, too. Cheaper than aspirin.

Dr. Joseph Mercola:

Oh my God.

Georgi Dinkov:

So, we'll see.

Dr. Joseph Mercola:

You'll have to send me a study on that, OK?

Georgi Dinkov:

I'll send-

Dr. Joseph Mercola:

Definitely. Yeah, send me-

Georgi Dinkov:

-you screenshots.

Dr. Joseph Mercola:

That's amazing. So, where are you getting this published?

Georgi Dinkov:

We'll see if they'll accept it. The group that I started back in Bulgaria, they are a bunch of chemists. So, unlike me, they have the credentials to publish. When I approach journals, the first question is, "You're an IT guy. What the hell are you trying to publish in a biochemical journal?" So, anyway, they'll try to approach some journals-

Dr. Joseph Mercola:

But if you write, give me copies. And after, I can swing it through some of the journals that – because I get invites to write articles for journals all the time.

Georgi Dinkov:

So, what I'm trying to do is, after we have proof of concept, then we're going to do a real follow-up study, which means there's a group that will have standard of care treatment, more animals because, right now, to keep the cost low, I'm doing three per group, but I want at least five because that's what they accept for statistical significance. And then I want to try on several different tumor models, both native to the mice and also several other human ones. Now, at least my argument is that, "Look, if this is working on, let's say, five or six different tumor models, some of them native to the mice, which means the mice are not immunocompromised, some of them on human tumors, xenograft models, which means the mice are immunocompromised, there must be some generic mechanism underneath that's really applying to all of these cases, and then I'll present the metabolic mechanism."

Because right now, the attacks that I'm getting with this, the criticisms have been, "Okay, these mice are immunocompromised. Basically, how do you know that you're not simply killing the tumor faster than you're killing the mouse?" I said, "Well, we kept the mice alive. They didn't die. And without treatment, the tumor never regressed." They say, "Well, it's a human tumor transplanted on a mouse. It doesn't really apply directly to humans. You really need a human study," which there are three case studies, which I may be – We'll see. Cancer patients have expressed interest. We'll see what happens. But if it works on a native tumor model and a human tumor model, I think it will get more attention in terms of publication. It will be less attackable as a fluke because it's a fact.

Dr. Joseph Mercola:

Yeah, yeah. Well, it's exciting. It's exciting. So, you had mentioned earlier that most of the cancer cells are alkaline.

Georgi Dinkov:

Yeah.

Dr. Joseph Mercola:

And I think we've talked – You and Brad Marshall seemed to be the two people who understand reductive stress the best that I know. Maybe Peter [Dobromylskyj] in Hyperlipid is up there, too. But do you think that the reductive stress, the surplus of electrons essentially in these cells, contributes to their alkalinity?

Georgi Dinkov:

Yeah, because the cell tries to get rid of the hydrogen ions, which are basically the excess electrons, and the way it does this is by exporting a hydrogen ion and a lactate molecule. And basically, by exporting the extra lactate, plus the hydrogen ions, you get extracellular acidity, but intracellular alkalinity.

Dr. Joseph Mercola:

Oh, that's the mechanism.

Georgi Dinkov:

Yeah. So, a healthy cell, because it's producing carbon dioxide, intracellularly, a healthy cell should be slightly acidic. And any kind of decline in the carbon dioxide production, you're going to get alkalinity with cancer being the very other side of the extreme. So, since the cancer cell is already deranged, it does have a mechanism to try to kill itself before killing you, but in order for that mechanism to kick in, it seems to be controlled by pH. I don't know the exact mechanism why that was proposed by Ray and he suggested the acetazolamide drug. And now by adding this much stronger acid, aspirin is also an acid, but not nearly as strong as this 2,6-dihydroxy analog, it seems to be confirming it because the tumor is regressing faster than the group that is using the aspirin and the vitamins. So I have them in several groups. The group that worked on the first experiment, which is the three vitamins plus aspirin, and now, there's a group with the vitamins and the more acidic analog, and that curve of regression is much steeper than the one with the aspirin.

Dr. Joseph Mercola:

So, curiosity question, did you control for the diet? So, are these animals all getting traditional rat chow?

Georgi Dinkov:

Yep, all of them. All them getting the exact, same-

Dr. Joseph Mercola:

So they're getting high linoleic acid on top of this?

Georgi Dinkov:

Exactly.

Dr. Joseph Mercola:

They're mitochondrial and metabolically poisoned?

Georgi Dinkov:

Curious experiment, which I performed a couple of – about a year ago, I said, "Let's see if we can do it only with diet." So I asked them, "Okay, try to put the mice on a completely fat-free diet and basically have to meet the fat-free diet for two weeks before you try to implant the tumor." So they did that, and the reason I said is that I'm expecting for the animals to get into essential fatty acid deficiency where they're eating-

Dr. Joseph Mercola:

[inaudible 01:20:27].

Georgi Dinkov:

Yeah. They could not implant the tumors. The lab said, "The mice are completely resistant to tumor implantation if they eat a fat-free diet for two weeks," which confirms another one of Ray's statements, that if you're essentially fatty acid-deficient, you shouldn't be developing cancer. It's almost impossible for a cancer to take root.

Dr. Joseph Mercola:

Yeah, they require fat for fuel.

Georgi Dinkov:

Yep, exactly. And especially the polyunsaturated fats, they seem to have [a] preference for them. So if you can remove those, and it looks like two weeks of that for the mice because they have much faster metabolism than us, that was enough to trigger essential fatty acid deficiency. No negative symptoms of the essential fatty acid deficiency. I know the Burr study said – What is it? Scaly skin, cracked skin, loss of weight — none of that happened in those mice. Maybe it was only two weeks, but then they destroyed the immune system. I think they irradiated the thymus or completely removed it, and they try to inject the tumor cells. And normally, on a normal diet, it happens in one day. This time, they tried 11 times, different times of different days to inject the mice with the human tumor cells. The tumor did not form. So the experiment basically demonstrated that, if you're essentially fatty acid-deficient and don't yet have cancer, in all likelihood, you will never have it.

Dr. Joseph Mercola:

Yeah. Well, we're not advocating that. I don't think a healthy-

Georgi Dinkov:

Well, of course. It is a curiosity thing, yeah. Yeah.

Dr. Joseph Mercola:

It's a curiosity, but it's a powerful demonstration of the critical importance of that. And also, it really dramatically contradicts some well-intentioned individuals. I can think of [Dr.] Thomas Seyfried on Boston College who wrote the book in metabolic theory of cancer, which promotes a high-fat diet, the exact opposite, and has gotten some interesting results in glioblastoma models. But what would he get if he had a no-fat diet and this aspirin analog that's 10 times more potent?

Georgi Dinkov:

I'm eternally grateful to Dr. Seyfried. He's a Nobel laureate, right? Because-

Dr. Joseph Mercola:

No, I don't think so. No.

Georgi Dinkov:

Well, isn't he the one that he took a cancer cell, took out the mutated nucleus, put it in a healthy cell-

Dr. Joseph Mercola:

No, I think that was someone else.

Georgi Dinkov:

-and showed there's no cancer? Oh, okay. All right.

Dr. Joseph Mercola:

That wasn't Seyfried. Seyfried cites his work quite a bit, but that's another researcher.

Georgi Dinkov:

Okay, okay.

Dr. Joseph Mercola:

It's not Seyfried, yeah.

Georgi Dinkov:

Yeah. But that, to me, conclusively proves that cancer is a metabolic disease. You can take a completely mutated nucleus, completely deranged, put it in a healthy cell mitochondria, cell behaves as normal. There's no cancer. But you take a cancerous mitochondria from a cancerous cell and you put [it] in a healthy cell, then you get a cancer cell.

Dr. Joseph Mercola:

Yeah, that's the proof is in the pudding. But just think if he understood reductive stress and implemented these strategies, or even seeking to address the fundamental cause, which is linoleic acid and a radical reduction in mitochondrial functions. Yeah, it is the mitochondria. For sure, there's no question that's the core. The absolute core of all diseases is the mitochondria. And the strategy to improve health and life extension and everything is all directed at the mitochondria. And we're in the process of acquiring technology, a license on a technology, that – Do you know what the gold standard for measuring mitochondrial function is?

Georgi Dinkov:

I was going to say a capnometer, but it's probably not [inaudible 01:23:45].

Dr. Joseph Mercola:

Oh, no, no, no, no. It's the Seahorse.

Georgi Dinkov:

Okay.

Dr. Joseph Mercola:

You've heard of the Seahorse before?

Georgi Dinkov:

No.

Dr. Joseph Mercola:

Okay. Look it up. You'll love it because it's what's done in all the research. Actually, it's the single gold standard for mitochondrial function. The problem is it's very pricey. It takes a few thousand dollars a test because it's cumbersome. They haven't figured out a way to preserve the sample. They have to do each one individually, and it's a nightmare. So, there's some new technology that suggests you can freeze the samples and still preserve the quality of the mitochondria, and measure it when you do the test, and batch them and reduce the cost by maybe a hundred-fold, so that's the intention. In my clinic, we're going to use that test and we're going to use indirect correlates of NAD+.

Georgi Dinkov:

Okay.

Dr. Joseph Mercola:

NAD+ is a nightmare to measure. We've had discussions on this, and you-

Georgi Dinkov:

Yeah. It's unstable, very difficult to measure, yep.

Dr. Joseph Mercola:

It's almost impossible. It really is almost impossible. There's only a few labs in the world who can do it accurately. I just shudder to think all these studies that are published on NAD precursors using these supplements. I just don't believe they're data because they can't measure NAD+. It's really hard. So what we discussed, and I think we discussed in one of our previous podcasts, in interviews, is that these redox pairs, like acetoacetate [and] bHB (beta-

hydroxybutyrate), and lactate and pyruvate, and then the oxidized and reduced forms of glutathione, if you can measure those, you got a good idea of what your NAD levels [are], indirect. Really, probably correlated well into high 90% and it [inaudible 01:25:17].

Georgi Dinkov:

Yep, much better than a direct measurement of the NAD+ to the NADH.

Dr. Joseph Mercola:

I think so. Do you agree?

Georgi Dinkov:

Oh, absolutely, yeah. Because the measurement, even in the cytosol, is very difficult, or in the blood as well. But mitochondrial NAD+ to NADH-

Dr. Joseph Mercola:

Impossible.

Georgi Dinkov:

-I don't know of anybody who's actually claimed to measure it reliably.

Dr. Joseph Mercola:

Yeah. And so the way to do it is to measure acetoacetate and beta-hydroxybutyrate, and that is almost the same ratio as NAD+ to NADH, which is what you want. It's exactly what you want.

Georgi Dinkov:

They're both mitochondrially produced. And because one of them is the oxidized, the other one, the reduced pair, they should directly mimic the NAD+ to the NADH ratio, mitochondrial.

Dr. Joseph Mercola:

And there's no question that if you have a good mitochondrial function in a surplus of NAD+, the likelihood of you suffering any disease is pretty remote because you're going to have more than enough cellular energy to compensate for almost anything that life can throw at you.

Georgi Dinkov:

[It's] recently showed that the naked mole-rat, which lives 40 years, the longest of any, I think, rodent of that size, one of the key distinguishing characteristics, aside from the high levels of CO2 in the burrow, is that it biochemically had very high levels of NAD+ to the NADH in the blood, and also very high levels of DHEA and pregnenolone.

Dr. Joseph Mercola:

Wow. Yeah, NAD+ is the key. So we're going to measure that in our lab, in our clinic. It's not really commercially available anywhere. I think Quest may offer it, but it's thousands of dollars to do it and not easy to do. We're going to do it in our labs. It's not that expensive to do. We get the test kits for each assay and you need a special fluorometric plate reader, and we can do it. So, I might be buying a number of these instruments and we'll measure it all over. I'm going to invite you because you were kind enough to measure my minerals in my nails-

Georgi Dinkov:

And your hormones were great.

Dr. Joseph Mercola:

-and steroids. I'm sorry?

Georgi Dinkov:

Yes, your steroids were great. I think the reason you did not benefit, you don't grow your height from DHEA, was that your DHEA was already at optimal levels.

Dr. Joseph Mercola:

I was using, for many years, the rectal suppository. So they do work, but it's so much easier, so much easier, the egg yolks and butter. Oh, [crosstalk 01:27:26].

Georgi Dinkov:

And tastier, and tastier, right?

Dr. Joseph Mercola:

Oh, much tastier. And sticking something up with your butt is not pleasure at all, although I am playing with intra-rectal CO2. We just have to get an IRB for it going up and running before we can promote it regularly and prove the safety, because no one has proven the safety at all, so we'd have to prove it. But I think that may be the single best biohack ever invented because CO2 is the bomb, absolute bomb, and it literally is the magic that will reverse the microbiome back to health. Because when you have a surplus of CO2, that's one of the nutrients that gets diminished when you aren't able to pay up enough cellular energy. Your CO2 levels go down. So if you supply artificially, exogenously, you can bypass that mitochondrial efficiency until you're able to get it back up, and that takes a while because you got to get the mitochondrial poison out of your system, and that takes years. So you're not going to see improvement for months of doing that. It just takes time. It takes time.

Georgi Dinkov:

Wow, a lot of projects on your plate.

Dr. Joseph Mercola:

Yeah, for sure. Yeah. I'm so excited and so appreciative of all your kindness and help, and really fighting with motivation to pursue this. Oh, we got the light issue, the time-out. All right. So, anything else you'd like to dive into?

Georgi Dinkov:

I think everything is fine so far.

Dr. Joseph Mercola:

Yeah.

Georgi Dinkov:

If we can avoid World War III, I think we'll be fine.

Dr. Joseph Mercola:

Yeah. I don't know that we're going to hit the World War III, but there would be some – This fall is-

Georgi Dinkov:

Going to be wild, right?

Dr. Joseph Mercola:

Oh, a lot of things are on [the] table this fall. I just hope we don't lose everything, but this could be – It's going to be a problem anyway around it, but it's just – And I'm not promoting any political party, but the potential for devastation is extraordinary and [inaudible 01:29:22].

Georgi Dinkov:

I explain to people, "Don't get at each other's throats," which is really the most interesting. And right now, there's certainly – By speaking to both sides, they're just really angry.

Dr. Joseph Mercola:

This fall is going to be very precarious. It may dictate whether we stay in this country or not. Really, it's just-

Georgi Dinkov:

Yeah. I agree, I agree.

Dr. Joseph Mercola:

Considering an exit strategy, just going to be a-

Georgi Dinkov:

Well, all the more reason for you and I to continue pumping out good information, give people hope, right? Because that's what keeps people grounded.

Dr. Joseph Mercola:

Yeah, yeah. Yeah.

Georgi Dinkov:

If they get nihilistic and start thinking that, "Nothing matters. I'm going to get cancer and die, so nothing really matters," then they're more prone to virus.

Dr. Joseph Mercola:

Nothing could be further from the truth. That's the beauty of this work, if you're close to death, and many people are, at some point we're all going to leave this life, but if you're a few weeks away, the likelihood of recovery is pretty low because you need a certain level of biological energy to catalyze the recovery. And below a certain level, you just don't have it, yeah. We might have technology in the future, but right now, it's not really there. But for most, that's pretty far gone. I think within a month, if someone is still alive in a month – unless they've taken poison. And what is the most common poison, aside from linoleic acid, that people take that's used therapeutically that kills people?

Georgi Dinkov:

Oh, radiation and chemotherapy.

Dr. Joseph Mercola:

Yep. Yeah, that's it. You knew it. Of course, you knew it, yeah. That's why if you're listening to this, maybe this will save your life for someone you love, cancer is a big cause of death. It's trending towards the No. 1 cause of death. If you become afraid and choose to believe the experts that are using fear to motivate you to make the choice to purchase their very expensive drugs that sell sometimes more than $100,000 a month, which they get a significant part of that profit – Yes, oncologists do earn a profit, a percentage of the dangerous drugs that they're using to kill you. And if you choose that, you may recover after the first round. But most likely after that, the more you take and the longer you spend before you get back on treating the cause, you've swallowed your poison. That's like taking cyanide and with no methylene blue in sight.

Georgi Dinkov:

Exactly, yeah.

Dr. Joseph Mercola:

You're going to die. We've seen this so many times. I think [Dr. Vladimir] Zelenko – Are you familiar with the Zelenko protocol for COVID?

Georgi Dinkov:

Yep.

Dr. Joseph Mercola:

He was confused, too. He used to embrace natural medicine after he was diagnosed with this very rare pulmonary sarcoma – pulmonary artery sarcoma, I think, and died from it because he took multiple rounds of chemo. I was helping him navigate that. He asked me to mentor him in doing this, and it was too late though. It just was too late. And he was a smart guy and was willing to do anything. But once you swallow that chemo poison, game is over, unless you just did it once and you woke up. You can get by maybe with one round, but after that, you're just not going to recover.

Georgi Dinkov:

Or if it's a localized tumor, maybe you can get away with the surgery-

Dr. Joseph Mercola:

Yeah, yeah. We're talking systemic.

Georgi Dinkov:

-or something.

Dr. Joseph Mercola:

Yeah, yeah.

Georgi Dinkov:

Once it becomes systemic, then it's like you're just adding more signal to the system that it's bad. It's cytotoxic therapy, that's why it's called that way.

Dr. Joseph Mercola:

Did you do that with your acid? Did you test them with chemo?

Georgi Dinkov:

Well, there will be the standard of care treatment, which we'll be following up and it'll be compared to this one. We've already determined that the current treatment is not cytotoxic. So how does it make the tumor disappear? I've asked several of the oncologists that are communicating on Twitter. They're saying, "Well, maybe it's because the mice is immunocompromised." I said, "Well, that shouldn't affect the tumor," but we don't know. Until you compare it to the standard of care treatment, we don't want to comment. So, we'll wait.

Dr. Joseph Mercola:

Yeah, they'll die, for sure. But I'm wondering if the standard of care – It would be an interesting arm is to do the standard care treatment and maybe treat them in a month, in two months and see if you can recover them and see – Maybe just do it with one month and then see if you can reverse it still.

Georgi Dinkov:

Yeah.

Dr. Joseph Mercola:

What is the threshold of insult that you have before you come in and rescue them before they're dead? Right?

Georgi Dinkov:

Yep. So, after, if we see that the standard of care treatment is about to die, we'll stop that and switch them over to the aspirin and vitamin therapy.

Dr. Joseph Mercola:

Oh, you do that?

Georgi Dinkov:

Yeah, yeah. Of course.

Dr. Joseph Mercola:

Oh.

Georgi Dinkov:

You do the crossover.

Dr. Joseph Mercola:

When did you do this study?

Georgi Dinkov:

No, I haven't. I'm saying, now, that will be the comparison. If we start seeing that the chemotherapy-

Dr. Joseph Mercola:

Oh, wow.

Georgi Dinkov:

-group is going to die, well, it's going to die anyway, so we might as well do a crossover. We're going to give the chemotherapy group the aspirin, and then we're going to give the aspirin group the chemotherapy. If we start seeing the reversal of the curves, then I think it's game over.

Dr. Joseph Mercola:

That could be as epic a study as the mitochondrial one, the transplant study that you just cited earlier, yeah. It's pretty comparable, actually.

Georgi Dinkov:

Yeah. It would be hard to argue that chemotherapy is good and that actually cytotoxicity is the way to go because almost all of the therapy is currently on the market. They're still all about killing the alien cancer cell.

Dr. Joseph Mercola:

So, are you going to write up a protocol for humans to take this?

Georgi Dinkov:

Yeah, because there's a pretty direct conversion formula. There are some minor things that need to be worked out because the formula that converts a mouse dose to a human one is based on body surface area metabolism. So, there are minor differences between individuals of each species, but the pharmacokinetics are pretty well-established for all of these chemicals because they're pretty well-known, except maybe for the acidic analog of aspirin. But there's some data on that, too, from the older studies with the humans.

Dr. Joseph Mercola:

So, I assume, because you're investing in doing the studies, you reviewed the literature quite aggressively that this is-

Georgi Dinkov:

Oh, yeah.

Dr. Joseph Mercola:

-probably the most potent metabolic intervention you can think of.

Georgi Dinkov:

Yes, short of doing T3 for which there are studies with cancer, older studies.

Dr. Joseph Mercola:

Okay, wow.

Georgi Dinkov:

And there are several studies of remarkable recovery from metastatic terminal cancer by giving natural desiccated thyroid at really high doses, 15 to 20 grains daily, but it's still not cytotoxic. And the explanation, even of the people at that time, was that, since it was in the '50s and '60s, they still remember Warburg and they said, "Mr. Warburg is probably right, the cancer should be treated with pro-metabolic therapy and not anti-metabolic therapy."

Dr. Joseph Mercola:

Right. The reason I'm so curious is because I didn't really show this publicly, but I alluded to the fact that I'm starting a Mercola health clinic in South Florida. And yes, we're going to have an outpatient clinic, but we're also building a restaurant.

Georgi Dinkov:

Excellent.

Dr. Joseph Mercola:

And we're also building a hotel.

Georgi Dinkov:

Nice. With CO2 therapy?

Dr. Joseph Mercola:

Yeah. Guess what two floors of the hotel are, the hospital?

Georgi Dinkov:

I was going to say with CO2 outpatient therapy, probably CO2-

Dr. Joseph Mercola:

Oh, no, that's separate. That's not in the hotel. That's in the clinic, actually, we teach people about the CO2. And then we'll have a fitness center, too. It's going to be a whole complex. We'll start building hopefully later this year. We got to get the zoning approval, so we have to get renderings first. But it probably will be the second-biggest attraction in the state of Florida after Disney World.

Georgi Dinkov:

I would say, no, not second, No. 1. I think Disney already messed up significantly.

Dr. Joseph Mercola:

Yeah, they did, but it's going to be quite the tourist attraction, for sure. And we'll be seeing people from all over the world, I'm really looking forward to it. But as we get in, that's not going to be – It's going to take us a year, a year and a half to build that, so it's going to be a while. But I definitely have to pick your brain for cancer therapies.

Georgi, it's been such a pleasure. I can't thank you enough for all the help you've provided in the past and then sharing a lot more interesting tips today. So, if people want to learn more about your work, I think you've got a blog and you've got a Twitter feed, which is the same name as this, Haidut. I think it's Haidut.

Georgi Dinkov:

Yes, yes.

Dr. Joseph Mercola:

H-A-I-D-U-T. And you know folks, this blog is free. It's wonderful. I have an RSS feed, so I know when there's a drop. I don't have to go every day and see it. And I would recommend that you search my website because all my old articles are up now, and you just look up for RSS feeds, and I put a nice bit of article on how you can get RSS feeds, and you can put Georgi as one of your feeds on there. You'll know when he drops a new one. But if I want to question something, the topic, and I want to find out some good stuff about it, I go to Georgi's site first and type in what I want to learn about, because he's usually found lots of great pearls.

Georgi Dinkov:

Thank you.

Dr. Joseph Mercola:

You're crazy nuts. It was just free. He's doing this out of the generosity of his heart. He doesn't charge for it. You don't have to pay for it, it's there. So, that's one. And then you got a Twitter feed, too, right? It's Haidut?

Georgi Dinkov:

Yes. Twitter, or X now, .com, whatever, /haidut.

Dr. Joseph Mercola:

Yeah, yeah.

Georgi Dinkov:

And yeah. Yeah, follow the-

Dr. Joseph Mercola:

Oh. Yeah, yeah. That's right, yeah.

Georgi Dinkov:

What is that principle? If you've been given knowledge freely, freely you should give as well. I think it's in the Bible, but I think it applies to everybody.

Dr. Joseph Mercola:

Yeah, for sure. Well, you're doing a great job and I can't thank you enough for all that you have done, especially helping me and nurturing me along, and being patient and kind, and helping me understand some basic principles I was profoundly ignorant about.

Georgi Dinkov:

Thank you. Likewise. I think it'll be a great benefit to humanity, so let's just keep going forward-

Dr. Joseph Mercola:

Yeah, I agree.

Georgi Dinkov:

-and pray for peace, and pray for peace.

Dr. Joseph Mercola:

Yeah, yeah. I hope so, yeah. Peace, for sure. Not only abroad, but internally because the fall could be pretty devastating.

Georgi Dinkov:

Yep.

Dr. Joseph Mercola:

Okay. All right. You take care.

Georgi Dinkov:

Well, thank you, Dr. Mercola. We'll stay in touch.